

## PREMISES FOR ECO-INNOVATION IN ROMANIA'S AGROFOOD SECTOR

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### Abstract

*Innovation is the top topic of the public agenda. Policy makers and business representatives are looking for innovative solutions to modern issues. Therefore, the research question is whether Romania's agrofood sector has strong conditions in order to run and implement eco-innovation. The main objectives of the paper are to emphasize the real conditions for eco-innovation in Romanian agrofood sector. The descriptive analysis proves that Romania's agrofood sector needs innovation and this may be a strategic approach for sustainable development of agrofood companies. On one hand, the findings proves that the Romanian small enterprises are quite vulnerable to market exchanges as they need further skills in order to face them. On the other hand, the small enterprises are not ready to implement digital activities, neither eco-innovation in their operations, even if this objective is on the short list of public policies agenda.*

**Key words:** Eco-innovation, entrepreneurship, digital single market, agrofood companies

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### Introduction

Innovation is the top topic of the public agenda. Policy makers and business representatives are looking for innovative solutions to modern issues. Therefore, the research question is whether Romania's agrofood sector has strong conditions in order to run and implement eco-innovation. The main objectives of the paper are to analyze some key indicators on RDI in Romania and Romania's agrofood sector, as well as to emphasise the real conditions for eco-innovation in Romanian agrofood sector.

Several hypothesis were tested in order to reach the objectives: there are different approaches of eco-innovation, Romanian agrofood sector need eco-innovation, eco-innovation needs to be a strategic approach for sustainable development in Romanian agrofood companies.

The research methods that were used are descriptive analysis, case studies and establishing premises and emphasizing premises for development and innovation implementation.

The paper is a conceptual one, part of a larger research in the field of resilience and entrepreneurship resilience.

The study reveals that the public policies in the field are ready to implement strategies and tactics in order to stimulate digital activities and eco-innovation within small companies, but

the enterprises themselves are not quite ready to embrace these high level activities in their operations.

## **1. Literature review**

Oslo Manual (OECD 2005) argues that the innovation represents the act of putting into business practice of a very new of better developed good or service and even a process or a marketing approach.

Furthermore, the eco-innovation is the concept of innovation approach for environmental advantages. Still, it would be better if the eco-innovation is not restricted to data regarding environment, but all the process and goods and services that aims to be better developed and implemented in the business process in general with the scope of environmental benefits (Arundel, A. V., & Kemp, R., 2009).

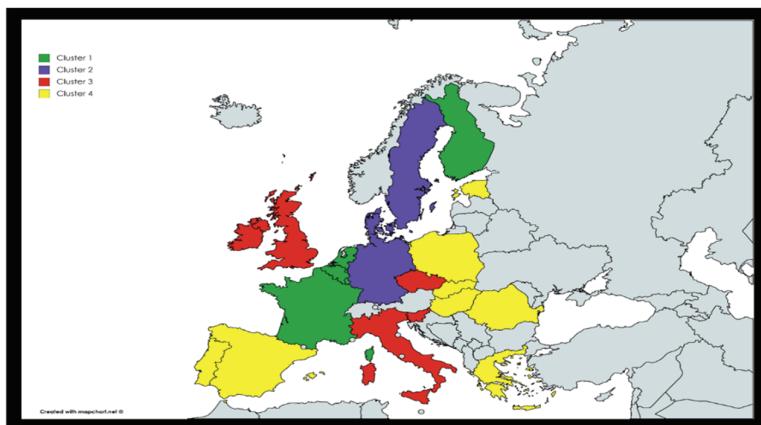
“Eco-innovation is a change in economic activities that improves both the economic performance and the environmental performance” (René Kemp and Peter Pearson, MEI Project);

A study on 323 sustainability reports of SMEs in emerging and developing economies certified by the Global Reporting Initiative proves that within the developed countries the eco-innovation is more likely to be implemented and has a great importance than in countries with emerging economies, as all the analysed variables of the study were significant in environmental dimensions. In the emerged economies countries there is not the same situation: only two of the analysed dimensions were sensitive to environmental and social variables (Valente Rezende, M.D., Cruz Basso, L.F. 2019).

## **2. Context of Eco-innovation**

The international performance in innovation continues to increase and to produce better life conditions. In the same time, the 2020 edition of European Innovation Scoreboard reveals an ongoing increasing by almost 9% for the last eight years ([https://ec.europa.eu/growth/industry/policy/innovation/scoreboards\\_en](https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en), accessed on October 2019). EU is more innovative and better at this process than United States, China and not only.

The best performers in Europa are: Sweden, Finland, Denmark and Netherlands, but countries such as Lithuania, Malta, Portugal, Greece and Latvia proves considerable increases.



**Figure 1. Clusters on EU countries by RDI similarities**

*Source: Mazurencu Marinescu Pele, 2019*

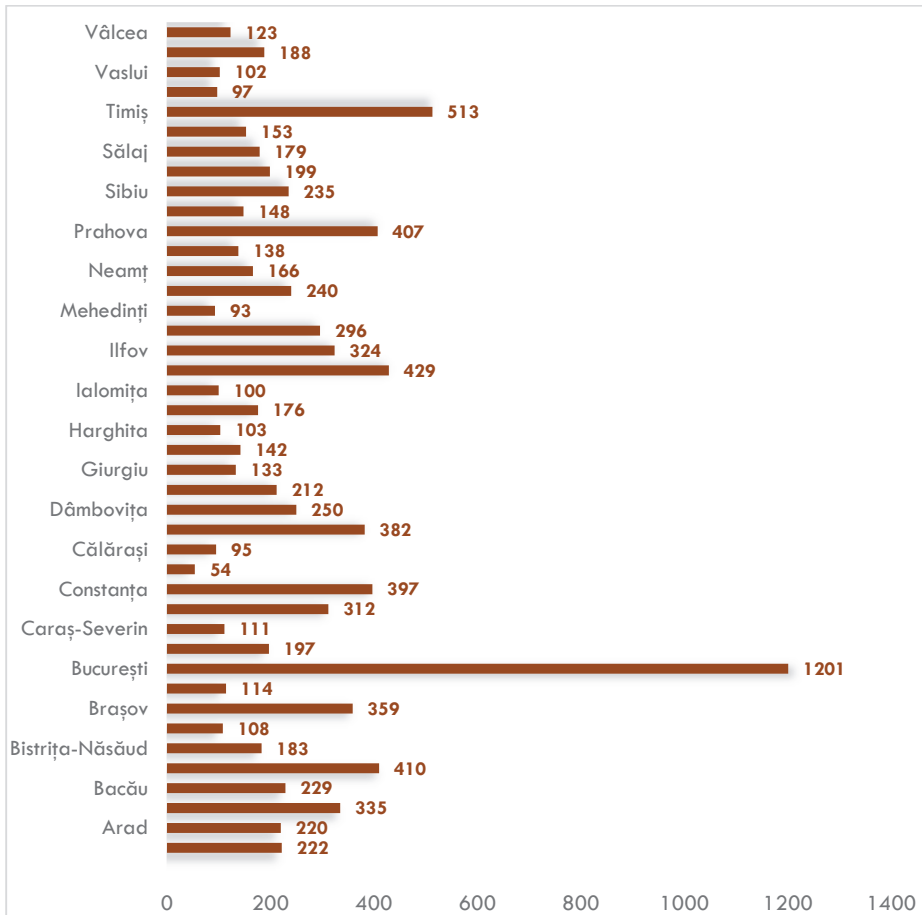
The situation may be given by the continuous increasing number of personnel involved in the sector, respectively the percentage of the active population in business enterprise sector who has activities in this area are higher and higher. It can be easily seen that the best performers have also the higher percentage of active population in the field of innovation.

**Table 1. Total R&D personnel and researchers Percentage of active Population in business enterprise sector**

GEO/TIME	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
European U	:	0.6511	:	0.7541	:	0.8036	:	0.8685	:	:
Euro area (1	:	0.756	:	0.8738	:	0.9133	:	0.9705	:	:
Belgium	0.8681	0.8743	0.8534	0.9559	:	1.0303	:	1.2401	:	:
Bulgaria	0.0969	0.1164	0.0979	0.0899	0.1069	0.1367	0.1929	0.3466	0.4239	:
Czechia	0.6132	0.6215	0.6675	0.7275	0.8009	0.8489	0.9257	0.947	0.9772	1.0524
Denmark	1.8104	1.6689	1.6705	1.6409	1.6079	1.5729	1.5893	1.6139	1.6636	1.7016
Germany (u	:	0.9348	:	1.0156	:	1.0009	:	1.097	:	:
Estonia	0.4512	0.4688	0.4815	0.4805	0.434	0.4224	0.4522	0.4063	0.3863	:
Ireland	0.6474	0.6979	0.7291	0.8739	:	1.1307	:	1.1864	:	:
Greece	:	:	:	0.2055	:	0.218	:	0.2497	:	:
Spain	0.5994	0.581	0.5701	0.5579	0.5517	0.5559	0.5592	0.5596	0.5748	:
France	:	:	:	:	:	:	1.1754	:	:	:
Croatia	0.1578	0.1799	0.1601	0.1573	0.1606	0.1661	0.1668	0.1781	0.2055	:
Italy	0.6014	0.6199	0.6336	0.6244	0.6525	0.6896	0.705	0.7598	0.9306	:
Cyprus	0.1653	0.1639	0.1423	0.1276	0.1131	0.1125	0.1064	0.1039	0.1475	:
Latvia	0.1614	0.1308	0.1819	0.1724	0.1632	0.1828	0.2423	0.2094	0.1832	:
Lithuania	0.1737	0.1432	0.1923	0.2188	0.1987	0.2406	0.3904	0.2823	0.2814	:
Luxembourg	:	1.822	:	1.7487	:	1.392	:	1.3737	:	:
Hungary	0.3389	0.3987	0.4536	0.497	0.5463	0.6004	0.5746	0.5288	0.514	:
Malta	0.3667	0.36	0.4797	0.6398	0.6549	0.5384	0.5439	0.4981	0.5167	:
Netherlands	0.7392	0.5951	0.8451	1.4105	1.4967	1.4881	1.526	1.4751	1.4853	:
Austria	:	1.2262	:	1.4043	:	1.533	:	1.6441	:	:
Poland	0.105	0.1087	0.1345	0.1574	0.1895	0.2222	0.2518	0.2861	0.4087	:
Portugal	0.5063	0.5142	0.5245	0.5954	0.606	0.6634	0.7156	0.8242	0.789	:
Romania	0.1284	0.1175	0.097	0.1315	0.1343	0.1303	0.1315	0.1315	0.1376	:
Slovenia	0.7242	0.7927	0.8286	1.2301	1.2108	1.2872	1.2776	1.2566	1.2728	:
Slovakia	0.1414	0.1332	0.1662	0.1699	0.1906	0.1809	0.1994	0.225	0.2618	:
Finland	1.5647	1.5606	1.5335	1.5529	1.5281	1.5587	1.5368	1.5488	1.4567	:
Sweden	:	1.3178	:	1.2635	:	1.3236	:	1.3662	:	:
United King	0.5127	0.5088	0.5463	0.6374	0.6558	0.7365	0.8203	0.865	0.9175	:
Iceland	1.3003	0.9645	:	1.1515	:	1.22	:	1.5724	1.5301	1.6508
Norway	1.0497	1.0515	1.0301	1.0353	1.0692	1.0846	1.1837	1.2715	1.3569	:
Switzerland	:	:	:	:	1.1706	:	:	1.2385	:	:
Montenegro	:	:	:	0.0813	:	0.0904	0.077	0.0826	0.0637	:
North Mace	0.0092	0.0099	0.0123	0.0221	0.0149	:	:	0.0549	0.0578	:
Serbia	:	:	:	:	:	:	0.1044	0.1104	0.1255	0.1084
Turkey	0.1443	0.1628	0.186	0.2135	0.2328	0.2529	0.2625	0.2683	0.2818	0.3293
Russia	0.5965	0.5713	0.5606	0.5539	0.5209	:	:	:	:	:
United State	:	:	:	:	:	:	:	:	:	:
China excec	:	:	:	:	:	:	:	:	:	:
Japan	:	:	:	:	:	:	:	:	:	:
South Korea	0.9792	1.0476	1.0998	1.1992	:	:	:	:	:	:

Source: eurostat.eu, 2019

The analysis for Romania should start from another point: the number of registered companies, whatever the main object activity they have. No matter what are the economic and social context of doing business in Romania, there different things to be taken into consideration while analysing the number of registered companies. Cities as Bucharest and Cluj, Iasi, Timisoara and Constanta have great business potential, given the better life conditions and the local infrastructure. In the same time, these are university centers, where entrepreneurial educational programmes are run. Therefore, this may be another cause for the high number of registered companies. Still, the most direct cause is that these are the most populated areas with the highest population density.



**Figure 2. Number of registered companies between 01.12.2018 - 31.12.2018, in Romania**

Source: Own preparation from *onrc.ro*, 2019

The number of new registered companies with direct or indirect connection with agrofood sector recorded decreasing in the last year of analysis. Given the new type of consumers and the new type of urban life in Romania, more companies were registered in the field of hotels and restaurants, where the agrofood sector is partially present.

The fact that the agribusiness and food industry, part of the manufacturing industry present a smaller number of new registered companies does not necessary means that there is a smaller interest in this areas.

**Table 2. New registered companies with direct and indirect connection with agrofood sector**

NACE	New registred firms 01.01.2019-30.09.2019	New registred firms 01.01.2018-30.09.2018	Dynamics	New registred firms 01.01.2019-30.09.2019
Agriculture, forestry and fishing	7680	15881	-51.64%	350
Hotels and restaurants	5575	3965	40.61%	432
Manufacturing industry	9029	10510	-14.09%	501
<b>Total</b>	<b>106435</b>	<b>101381</b>	<b>4.99%</b>	<b>9071</b>

*Source: own preparation from www.onrc.ro, 2019*

These facts need to be corroborated with other information such as the number of financing programs for start-up that were put into practice that year, the number of the university graduates etc. Therefore, Romania has a small areas of business and an even smaller possibility for innovation. In the same time, Romania needs to face and apply different European regulations and directives which require eco-innovation.

### 3. Opportunities and key factors: - InvestEU and digital single market

Digitalization is the future. Smart industry, smart agriculture, and smart chains are all in the context of digital single market, as this is the best way of obtaining efficiency and competitiveness. From this extent, the EU Commission emphasizes the importance of Europe's becoming a world leader in the digital economy and achieved and is in the process of implementing The digital Single market strategy in order to boost digital opportunities for Europe's citizens and business actors (<https://ec.europa.eu/digital-single-market/>, accessed on May 2019).

In the same time, there are several opinions that claims the elementary impact of the digital single market on the economy and economies (Zimmermann, H.-D., 2000, p. 729). But the world is on this direction and dimension and there no other turn around, as this is the future, the overtechnologization in the name of resilience, efficiency and smart connections, all types of connections.

In order to become digitalised, modern business structure are necessary, new business models are required and smart services for facilitating innovation are essential.



**Figure 3. Services offered by Digital Innovation Hubs**

*Source: FactsheetDigitalInnovationHubs.pdf, May, 2019, May, 2019*

Starting from the best practices in the field, such as following, the Romanian business may innovate and eco-innovate as follows:

- Fields and crops may be monitor by using drones;
- Internet of things may give crucial information regarding weather conditions, water needs and crops state;

- Sensors may be used in order to determine plants' pesticides and water needs;
- Integration of all digital applications may boost the company efficiency and competitiveness by doing a more effective risk management and a more resilient business.

From this point forward, the eco-innovation may intervene and boost the company economic and financial results. And the decision should take into consideration the long term advantages, not only the short terms efforts.

#### 4. Opportunities and Key factors: - Multinational companies/investors

On the other part, the multinational companies in agrofood sector are the best representatives in the field of innovation investments. They are these who innovate in business models more suitable to new consumers behavior, in obtaining new products, in discovering new chains and distribution channels and not only.

In order to better understand the possibilities for innovation, we should start by analyzing the number of the foreign investments in business in Romania.

**Table 3. Ranking by country of residence of investors in companies with foreign participation in the share capital -on December 31, 2018**

No	Country	Companies with foreign participation		Value of subscribed share capital					
				Total in national currency		Total in equivalent of currency		Total in equivalent of currency	
		No	%	thousand LEI	%	thousand USD	%	thousand EURO	%
0	1	2		3		4		5	
	Total ROMANIA	221.334	100,00	177.215.092,7	100,00	63.117.494,8	100,00	48.261.066,1	100,00
1	NETHERLANDS	5.258	2,37	39.132.494,1	22,13	13.223.303,9	21,45	9.838.768,0	21,76
2	AUSTRIA	7.589	3,42	16.622.009,1	9,40	7.074.509,4	11,48	4.904.148,4	10,85
3	GERMANY	22.682	10,23	16.112.633,0	9,11	6.851.732,2	11,11	4.878.344,7	10,79
4	CYPRUS	6.029	2,72	20.422.896,1	11,55	6.312.588,0	10,24	4.863.891,9	10,76
5	ITALY	47.239	21,32	10.613.985,0	6,00	3.535.933,4	5,74	2.606.379,2	5,77
6	FRANCE	9.309	4,20	9.086.710,4	5,14	3.287.995,4	5,33	2.315.549,5	5,12
7	LUXEMBOURG	998	0,45	7.957.257,3	4,50	2.449.145,6	3,97	1.899.980,7	4,20
8	SPAIN	5.976	2,70	6.923.610,6	3,92	2.296.989,5	3,73	1.719.209,4	3,80
9	GREECE	7.322	3,30	4.520.895,1	2,56	2.028.314,8	3,29	1.359.500,1	3,01
10	CZECH REPUBLIC	1.046	0,47	5.826.205,1	3,30	1.616.003,2	2,62	1.360.618,8	3,01
11	SWITZERLAND	3.014	1,36	4.025.389,2	2,28	1.572.027,4	2,55	1.139.096,8	2,52
12	UK	5.751	2,60	3.913.863,8	2,21	1.439.578,9	2,34	1.016.078,8	2,25
13	HUNGARY	13.756	6,21	3.714.485,7	2,10	1.333.517,0	2,16	991.571,5	2,19
14	US	7.672	3,46	2.613.978,4	1,48	1.132.381,2	1,84	766.807,0	1,70
15	BELGIUM	3.999	1,80	2.803.709,4	1,59	890.242,0	1,44	698.848,7	1,55
16	TURKEY	15.433	6,96	1.849.032,0	1,05	728.669,9	1,18	516.855,3	1,14
17	THE NETHERLANDS ANTILLES	15	***	2.035.357,1	1,15	723.039,8	1,17	501.926,4	1,11
18	POLAND	1.099	0,50	2.019.367,6	1,14	564.862,0	0,92	443.380,3	0,98

19	DENMARK	938	0,42	1.677.591,8	0,95	530.578,8	0,86	394.890,3	0,87
20	SWEDEN	1.532	0,69	1.181.396,9	0,67	415.229,9	0,67	296.626,6	0,66
21	CHINA	12.597	5,68	1.041.043,0	0,59	406.108,0	0,66	284.611,4	0,63
22	PORTUGAL	617	0,28	999.078,0	0,57	343.400,0	0,56	246.120,7	0,54
23	I.VIRGINE BRIT.	391	0,18	1.083.818,0	0,61	332.749,9	0,54	266.813,4	0,59
24	JAPAN	369	0,17	996.322,0	0,56	322.271,9	0,52	239.340,2	0,53
25	SOUTH KOREA	255	0,12	720.546,1	0,41	257.390,5	0,42	201.075,5	0,44
26	BULGARIA	2.541	1,15	718.465,6	0,41	208.206,0	0,34	167.516,3	0,37
27	INS.BERMUDE	201	0,09	599.706,9	0,34	164.023,7	0,27	137.822,3	0,30
28	LEBANON	4.187	1,89	400.400,6	0,23	161.957,5	0,26	115.260,5	0,25
29	CANADA	2.005	0,90	425.224,2	0,24	145.184,6	0,24	106.869,9	0,24
30	FINLAND	193	0,09	226.820,0	0,13	122.469,6	0,20	69.701,5	0,15
31	UKRAINE	804	0,36	435.715,1	0,25	112.206,0	0,18	97.779,0	0,22
32	NORWAY	396	0,18	328.044,2	0,19	109.370,0	0,18	80.750,9	0,18
33	GIBRALTAR	72	0,03	218.816,4	0,12	85.389,3	0,14	58.721,9	0,13
34	WITHOUT CITIZENSHIP	44	0,02	696,7	***	76.763,0	0,12	53.317,4	0,12
35	ISRAEL	7.763	3,50	414.013,3	0,23	72.754,7	0,12	52.824,3	0,12
36	MALTA	182	0,08	187.468,8	0,11	57.746,2	0,09	44.617,3	0,10
37	PANAMA	245	0,11	39.198,5	0,02	55.825,8	0,09	27.652,7	0,06
38	LIECHTENSTEIN	223	0,10	3.359.170,7	1,90	55.114,7	0,09	39.505,5	0,09
39	INS.MARSHALL	33	0,01	154.332,7	0,09	53.676,6	0,09	37.482,5	0,08
40	MOLDOVA	5.675	2,56	149.776,8	0,08	53.218,9	0,09	38.701,2	0,09
41	SLOVAKIA	714	0,32	155.583,5	0,09	53.007,7	0,09	38.307,5	0,08
42	SEYCHELLES	52	0,02	175.814,3	0,10	52.190,6	0,08	39.966,8	0,09
43	BELIZE	44	0,02	154.344,5	0,09	50.788,2	0,08	38.268,3	0,08
44	R. ARABA SIRIA	6.127	2,76	106.175,9	0,06	49.604,0	0,08	34.875,9	0,08
45	AUSTRALIA	799	0,36	129.939,2	0,07	47.746,7	0,08	34.798,5	0,08
46	EGYPT	1.817	0,82	117.188,8	0,07	43.542,9	0,07	31.744,8	0,07
47	SLOVENIA	237	0,11	93.211,2	0,05	37.629,7	0,06	25.846,9	0,06
48	IRAQ	6.041	2,73	69.303,7	0,04	37.538,1	0,06	25.822,6	0,06
49	INS.VIRGINE AMR.	187	0,08	120.469,2	0,07	36.294,2	0,06	27.109,7	0,06
50	UNITED ARAB EMIRATES	147	0,07	139.082,1	0,08	36.194,4	0,06	30.510,6	0,07

Source: National Trade Register Office in Romania

In Romania, the biggest investors are not especially those that are coming from the most developed countries, but foreign investors are also those who came from all over the world.

## Conclusions

The innovation is one of the most topic of the European public agenda. Eco-innovation is a more modern concept, a more deep one, that is very well represented in the context of sustainable development.



Romanian agrofood sector need eco-innovation in order to become more competitive and more efficient.

From this perspective, eco-innovation needs to be a strategic approach for sustainable development in Romanian agrofood companies. Following the findings, Romanian companies are very vulnerable, in general, and more vulnerable if consider the power of the multinationals. By financing and implementing innovation results, their chances for being more competitive are raising for a small company. Therefore it is that necessary.

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