

STIMULATING HUMAN RESOURCES IN THE ROMANIAN AGRICULTURAL AND FORESTRY RESEARCH

Simona BÂRA¹, Alina ZAHARIA², Cristian TEODOR³, Elena PREDA⁴

¹ PhD, Senior Researcher, Associate Professor, The Bucharest University of Economic Studies, email: simonica.bara@gmail.com,

² Ph.D, University assistant, The Bucharest University of Economic Studies, email: alina.zaharia00@gmail.com,

³ Ph.D, University assistant, The Bucharest University of Economic Studies, email:cristian_teodor84@yahoo.com,

⁴ Ph.D, University Lector, The Bucharest University of Economic Studies, email: elena.preda10@gmail.com

Abstract

Romania's agricultural and forestry research are facing to serious failures due to its current funding system and the lack of attractiveness of a research career.

The paper presents some issues referring to the agricultural and forestry research with accent on the human resources and it proposes some measures in view to reinvigorate and increase the efficiency by: involving researchers in dissemination of their most important results by building "bridges" with consumers of information (small and medium agricultural producers); starting of a coherent process of leaders formation from the ranks of young researchers; including in the management plans of the research entities from agriculture and forestry the provisions of the National Strategy for Research, Development and Innovation 2014-2020 dedicated to the research labor market

Key words: agriculture; human resource; research expenditure; leadership; partnership.

Introduction

The "Global Competitiveness Report 2017-2018 (The Global Competitiveness Report 2017-2018", 2017, which was published by the World Economic Forum in the context of "Initiatives for the Future of Economic Progress System Initiative) developed by the World Economic Forum highlights the recovery of the global economy. At the same time, it recognizes the role of technology in shaping the global economic, social and political order. Regarding Romania, the mentioned Report specify the negative contribution of both state activity (bureaucracy, poor infrastructure, difficult access to finance, incoherent taxation, etc.) and of the business environment, which explains the low levels of the main human resources indicators (such as capacity to keep talent, ability to attract talent, staff training, spending on R & D, innovation capacity of companies, capacity of new enterprises to assimilate technologies, the degree of production processes sophistication) that characterize the country's economic profile.

Several of these shortcomings are also found in the Romanian agricultural and forestry research, which for more than 25 years has been experiencing serious malfunctions generated by the current institutional and financing system of the field, as well as the lack of attractiveness of a research career.

In this paper we propose an analysis of the state of agricultural and forestry research in Romania, as well as the identification of some of the possible ways of activating the existing human resources in the field.

Literature review

The Romanian agricultural and forestry research is carried out in the following institutional structures: the institutes and research and development stations of the Academy of Agricultural and Forestry Sciences "Gheorghe Ionescu-Sisesti" (AAFS); in five Universities of Agronomic Sciences and Veterinary Medicine from Bucharest, Iasi, Cluj, Craiova and Timisoara; in private companies.

Both national research units and five Universities of Agronomic Sciences and Veterinary Medicine administer public and private state patrimony in order to ensure their activities as a basis for scientific and technological competence, expertise, and human resource development and documentation scientific and technical research. Also, their research goals are included in the National Strategy for Research, Development and Innovation (RDI).

1. The state of human resources in agricultural and forestry research

1.1. Total number of scientific researchers

The processes of Romanian economy adapting to the market economy, as well as to the European space of scientific research, have not been realized without losses, some of which are irretrievable. In 2015, were 27,253 researchers in Romania, with 11.2% fewer than in 2010. In research areas, in 2015, the research staff structure was as follows: 44.2% of the total number of scientific researchers were in the field of engineering sciences and technology; 19.3% in natural and exact sciences; 12.8% in social sciences; 9.7% in medical science; 8.8% in agricultural sciences; 5.1% in humanities. Regarding the evolution structure of the research staff, in 2015 as compared to 2010, the share of researchers increased in the following fields: engineering and technological sciences (by 6.1%); natural and exact sciences (by 2.5%); agricultural sciences (by 1.8%, respectively from 7.0% in 2010 to 8.8% in 2015); also, there were diminution in the share of total researchers, in 2015 as compared to 2010, in social sciences (with -4.7%), humanities (with -4.0%) and in medical sciences (with -1,6%).

**Table 1. Researchers from the research-development activity by scientific area/fields.
Number of persons (at the end of the year)**

	2010	2011	2012	2013	2014	2015	Dynamics 2015/10, %
Total	30,707	25,489	27,838	27,600	27,535	27,253	88.8
<i>Researchers by scientific area/fields</i>							
Natural and exact sciences	5,163	5,448	4,789	4,986	4032	5259	101.9
Engineering and technological sciences	11,718	10,122	13,063	13,157	12,904	12,053	102.9
Medical Sciences	3,491	3,010	2,572	2,621	2,736	2,656	76.1
Agricultural sciences	2,154	1,293	1,252	2,398	2,525	2,396	111.2
Social sciences	5,376	4,112	4,428	2,484	4,204	3,500	65.1
Humanites	2,805	1,504	1,734	1,954	1,134	1,389	49.5

	2010	2011	2012	2013	2014	2015	Dynamics 2015/10, %
Researchers at 10,000 civilian employees, persons	36.7	30.5	32.5	32.4	32.7	32.7	89.1
Researchers in agricultural science to 10,000 people employed in agriculture, persons	6.2	4.0	4.2	8.9	10.3	11.0	176.9
The ratio between the researchers in agricultural sciences to 10,000 persons employed in agriculture and the total researchers to 10,000 civilian employed	0.18	0.13	0.13	0.28	0.32	0.34	195.3

Source: Processed from "Romanian Statistical Yearbook", NIS, Bucharest, 2017

For the agricultural and forestry sector, the number of scientific researchers involved in agriculture and forestry to 10,000 persons occupied in the branch, in 2015, was 11.0 researchers. It should be noted that in 2010 the level of this indicator was of 6.2 researchers in agriculture to 10,000 persons employed within the branch. So was an increase of reference indicator from agriculture faced to total economy by 1.8 times³. The same phenomenon is found in the ratio of the number of scientific researchers to 10,000 persons employed in the economy (increase of 1,95 times).

Table 2. The number of PhD students trained by the five reference universities

	2013	2016	Dynamics, %
University of Agronomic Sciences and Veterinary Medicine (UASVM) from Bucharest	115	201	174.8
UASVM Cluj	109	106	97.2
UASVM Iasi	64	56	87.5
UASVM Timisoara	16	43 ^{*)}	268.8
Faculty of Agronomy from Craiova University	26	26 ^{e)}	100
Total	330	342	103.6

^{*)} 2017; e) – Estimation

Source: Data processing according to the websites of reference universities.

Another indicator which influenced the future evolution of human resources in agricultural and forestry research is the number of doctoral students trained by the five mentioned universities. In 2016 the number of PhD students was 342 persons, up by 3.6% over 2013 (330 PhDs). In 2016, the highest number of PhD students was registered by University of Agronomic Sciences and Veterinary Medicine (UASVM) from Bucharest (201 PhD students, which represented 58.8% of the total) and by UASVM Cluj (106 PhD students, which represented 31.0%).

1.2. Current expenditures in R & D activity, by performance sectors and research types/ categories

The total current expenditures on R & D activity, by performance sectors and types of research, amounted to ROL 2,762.1 million in 2015 (euro 610.5 million)(Exchange rate at December 31, 2015 was 4.5245 lei (RON) per 1 euro, <http://cursbnr.clubafaceri.ro/arhiva/2015-all-all/>), up by 35.1% as compared to 2010. As a whole, the structure of current expenditures on R & D activity from Romania has oriented to applied research (49.4% of total expenditures, in 2015) to the detriment of the fundamental one (31.5%).

The structure of R & D current expenditures by type of research and performance sectors highlights the following issues:

- in the business sector the highest weights are held by applied research (63.6% of the total sector) and by experimental development (25.8%);
- in the public sector the largest shares of current expenditures are held by fundamental research (48.1%) and by applied research (39.0%);
- in the tertiary sector the highest weights are held by fundamental research (60.0%) followed by applied research (27.4%) and experimental one (12.6%);
- in the main non-profit private sector the highest weights are held by fundamental research (51.6%), followed by applied research (37.6%) and experimental research (10.8%).

By sectors of activity, in 2015, *the structure of the current expenditure for the R & D activity* are:

- 48.4% of the total are expenditures are in the *business sector*;
- 38.6% are in the *government sector*;
- 12.7% are in the *higher education sector*;
- 0.3% are in the *non-profit private sector*.

Comparing the evolution of the structure of the current expenditure for the R & D activity, in 2015 compared to 2010, there is an increase of the expenditures in the business environment by 11.4%; in the same time on note the decrease of the current expenditures for the research-development activity of the higher education sector by 11.3%.

On mention that the total *expenditures for the research and development activity allocated to agriculture by the business sector* represents only 1.2% of the total, respectively RON 17.9 million, in 2015 (compared to RON 10.95 million, in 2013). *However, it should be underline that the trend of these allocations has been steadily increasing (1.64 times in 2015 compared to 2013)*, but them were far by the evolution of the total indicator (the expenditures for the research and development activity allocated by the business sector, in 2015 compared with 2013, increased by 1.33 times).

With all these results which characterizes the total R & D expenditure allocated to Romanian agriculture, however, if their structure is taken into account on the basis of expenditure categories, i.e. current and capital expenditures on can say: in the business sector, current expenditure decreased in favor of capital ones (the current expenditure decreased from 88.92% in 2013 to 87.38% in 2015 and capital expenditures increased to 11.08% respectively to 12.62%); in agricultural and forestry research sector the situation has been reversed – the current expenditures increased (from 92.89% in total in 2013 to 95.49% in 2015) and the capital expenditures decreased (from 7.11 % in 2013 to 4.5 in 2015).

Table 3. Applications for inventions recognition – number

	2010	2011	2012	2013	2014	2015	Dynamics 2015/10, %	Structure, %	
								2010	2015
Total									
Applications for inventions recognition – total	1,418	1,462	1,077	1,046	1,036	1,053	74.3	100	100
By categories of applicants:									
Romanian applicants:	1,382	1,424	1,022	995	952	980	70.9	97.5	93.1
Research Institute	334	357	208	136	156	168	50.3	23.6	16.0
Education Institutes	346	288	225	206	141	89	25.7	24.4	8.5
Of which: in the technical field numed "Necessities of life"	308	322	264	248	242	274	89.0	x	x
Share of Applications for inventions recognition in the technical field "Necessities of life" in the Total no. of applications.%	21.7	22.0	24.5	23.7	23.4	26.0	4.3*)	x	x

*) Percentage points

Source: Processed from "Romanian Statistical Yearbook", National Institute of Statistics, Bucharest, 2017

Regarding the way of financing the agricultural research units in the AAFS network or those outside it, it is not without interest to specify that it is regulated by two organic laws – The Law no.45/2009 on the organisation and functioning of the “Gheorghe Ionescu-Șișești” Academy of Agricultural and Forestry Sciences and of the research and development system in the fields of agriculture, forestry and food industry and The Law no. 72/2011 amending and supplementing Law no. 45/2009. According to the Law no. 45/2009, the financing of agricultural research sector is realized from its own revenues and subsidies from the State Budget. However, for three consecutive years (2013, 2014 and 2015), the State Budget Law suspended the application of Organic Laws regarding the financing of agricultural research units in the AAFS network (the Law no. 45/2009). This decision created real existential problems for the agricultural research sectors (arrears, receivables, incapacity to realize their own revenues, blockages from the debts to the State Budget of the research units, and the impossibility of the AASF to attend in competitions for European funds accessing, etc.) – all of this threatening both the realization of National Research Programs with a high importance for the Romanian economy (the fruit tree programme, the wine programme, the programme for achievement hybrids and sheep breeds, the programme for grasslands and pastures, etc.), on the one hand, and, on the other, the quantity and quality of human resources allocated to the research sector.

1.3. Some results from the research activity: applications for inventions recognition and research projects carried out

In 2015, the total number of applications for inventions recognition was 1,053 out of which 26,0% (274 applications for inventions recognition) came from the technical area with the name "Necessities of life"(which included agriculture and forestry, also).

The evolution of the reference indicator – in 2015 as compared to 2010 – on the whole, was a regressive one (it decreased with 25.7%).

By category of applicants for inventions recognition, most of the proposed applications came, in 2015, from Romanian applicants represented by individuals (50.0% of the total).

Romanian applicants for research inventions decreased by a total share (from 23.6% in total to 16.0% in 2010), while education institution inventions have decreased their share in total (from 24.4% in total in 2010 respectively to 8.5% in 2015).

The *total number of projects accomplished* in 2015 was 7,872 and the *total research and development current expenditures on the project* was RON 246,021; only 10.1% of the total number of scientific research projects accomplished were from agriculture (794 projects accomplished, which included agriculture and forestry, also), with an average value of RON 218.406 per project (by 11.2% below the national average).

Another result of the research activities in the field of agro-forestry is the various publications realised by each research institution involved. At the AASF level, the following are main recognized: Scientific research offer for technological transfer in agriculture, food industry and forestry; AASF Brochure; AASF yearbook. One can mention that these publications ensure the continuity of actions to disseminate to a large circle of users the main research results of the units from AASF with practical applicability. Also, AASF regularly publishes on its website (<http://www.asas.ro/wcmqs/oferte-inovare/>) its innovation supply, such as: Lamb fattening technology along with sheep mothers; Romanian goat line; Reghin meat population; Ecological method of cultivating the Chardonnay variety; Plant cultivation process by applying dewaxed and anaerobically stabilized sludge to acidic soils; Lavender harvesting equipment; Modernizing and optimizing the structure of alfalfa varieties, etc. Similar initiatives are also in the relevant universities.

2. Possible development ways for the human resource from the agricultural and forestry research in Romania

"Always we need to look to the future. When the world around you it changes and changes are over you, it must to understand what you have to do because to cry is not a solution"(Jeff Bezos, founder of Amazon.com)

Taking into account the incentive of the "Amazon.com" founder Jeff Bezos and keeping the dimensions, we will try to outline some of the immediate possible measures that can be taken to revive human resources in agricultural and forestry research.

The proposed measures are based on the assumption that existing agricultural and forestry research entities that produce specific information and knowledges do not have only the role of a "passive storage". It is time for them to come out of the present patterns and to try to connect to the socio-economic environment, to the requirements of the specific actors for which they "produce", respectively the agri-food sector and, finally, the agricultural producers.

This part of paper presents some measures in view to revigorate and increase the efficiency of human resources from agricultural and forestry research, which relate to: involving researchers in dissemination of their most important results – information and knowledges – by building "bridges" between researchers and information consumers (agricultural producers); starting a process of leaders training among young students and researchers, given the reduced number of senior researchers and their advanced age; in order to increase the activity of research units, one is proposed to include in the management plans of the agricultural and forestry research entities the provisions of the National Strategy for Research, Development and Innovation 2014-2020, dedicated to the research labor market, measures that represent openness of opportunities.

2.1. Changing the paradigm of human resources management and increasing the capacity to communicate of the agricultural and forestry research institutes and stations

The accelerated development of social media products has facilitated easy connection among people from the most diverse areas, regardless of their economic, social, cultural or geographical status. Thus, a new fulfillment model of personal, professional and social responsibility has emerged. Unfortunately, the main value-added producers from the research, the researchers, either remain in a isolation state or have a low visibility because of their modest material and financial resources received by the research units from the public budget.

The new paradigm of human resource management in agricultural and forestry research invites these people to rethink the individualism and collectivism in their institutes. These attitudes must coexist because the quality of research results are fueled by a solid substrate of individualism and professionalism and, on the other hand, by the development of the institutional capacity to interact with the real world of the consumers of the research results obtained. Basically, everything happening at individual, professional, institute / research level must influence the local, national and even global environment.

There is a lack of critical mass of human resources in agricultural and forestry research in view to develop areas of perspective, for interdisciplinary research and innovation and, in particular, to ensure the transfer of knowledge. The number of researchers is still insufficient, and the R&D institutes and centers are delayed in their engaging in the development of regional or local consultancy centers.

Researchers' mobility is limited and this is a phenomenon that has an undesirable impact on the circulation of technical knowledge and innovation. Private sector access to public research infrastructures is difficult and than the extent of use its results – as a real opportunities to its development – is low.

The RDI sector from Romanian agriculture and forestry is under-sized compared to country's natural and biodiversity resources. This phenomenon is due to: reduced funding of the sector. In absolute figures, ("Romania spends on research and development per capita almost 20 times less than the European average". See "The National Strategy for Research, Development and Innovation 2014-2020", April 2014) (; communication of agricultural and forestry research results is insufficient due to the weak links amongst research representatives and small agricultural producers; the potential beneficiaries of the research results - the nearly 4 million subsistence and semi – subsistence farms – do not have intellectual training or financial resources to access the expert knowledge from agricultural and forestry research units.

We appreciate that by the establishment of a "Dissemination system based on in advance subscriptions to agricultural advisory services" within the institutes / research centers one can set-up the real premises for the revitalization of the links between the qualified human resources existing in the agricultural research units, on the one hand, and most small farms, on the other one.

We propose to set-up a "*system of in advance subscriptions for agricultural advisory services*" at the level of research institutes / research centers. Thus, it is possible to create real premises for reviving, on new bases, the connections among agricultural and forestry research and agricultural producers, respectively the links among the existing qualified human resources and the majority of the small agricultural households.

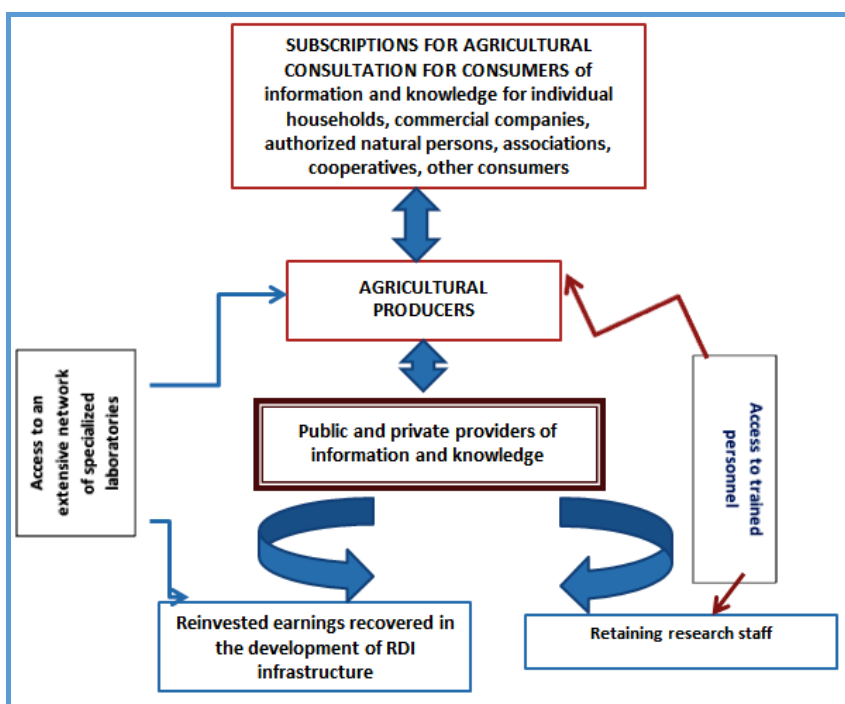


Figure 1. Scheme for subscriptions to agricultural advisory services for consumers of information and knowledge by individual households, commercial companies, authorized natural persons, associations, cooperatives, other consumers

Source: Popescu, G; Preda, Elena; Bara, Simona, 2017, „*The effects of the transition period on the knowledge transfer market in Romanian agriculture*”, manuscript

For the first step, agricultural and forestry research institutes depending on their specific areas, can develop and place on their own institutional sites applications with information about the types of services they can offer.

A such initiative can be successfully implemented with the expansion of the use of social media devices, for example, mobile phones, as well as the fact that everything is interconnected and interdependent in the Universe. On this way, our understanding of the world and how on interact with each other acquires real valences for a large number of farmers, contributing to unitary dissemination and various forms of materialization of information and knowledge gained in research activity and them transfer to the level of agricultural producer (in fact, they are the real consumers of information and knowledge from research activities).

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As the system of subscriptions to agricultural advisory services develops, the researchers will be able to diversify/ differentiate this kind of services according the information and their know-how required by the market, respectively by the agricultural producers. In addition, a such activity is likely to drive to the increase of motivation, from a new position qualified human resources from the agricultural and forestry research and development institutes, but also it contributs to increase the confidence of the agricultural producers in the research results.

By this proposed project on hopes to revigorate the agricultural advisory activities.

2.2. Reviving the leadership in agricultural and forestry research

In an interview with Review Economic Tribune /Tribuna Economica , The ex-president of AASF Gheorghe Sin(Sin, Gh. (2015). "Scientific research and the performance of Romanian agriculture", in Review Economics Tribune, no.35, September 2) mentioned: "... The problem of human resources in the research is the most serious, it is very difficult to solve, not only because of the underfinancing and unattractive of it, but also because the young people who come in the research sector no longer has mentors to teach them, to shape, to transmit the knowledge and experience accumulated over the years. On are quickly reaching the point where we will resort to the intelligence import, because the Romanian intelligence, neglected by us, it is in the service of the others. It's not a good thing!..."

In this context, on appreciate as beeing of interest the fact by which the human resource from agricultural and forestry research feels the need to be reinvigorated by their leadership. The magnitude of the development of emotional intelligence within active generations after 1990 – this being represented by increased of self-awareness, autonomy development, motivation, empathy, and social skills – has driven to leaps in the individual perception capacity of the surrounding reality. Than, the leadership in research has become more than "leading to impose opinions and ideas." The leadership of the agricultural research institutes / research centers will have to be interested with the formation of leaders by extending, for example, of the practice named "Lead by Example".

Box 1. Top 10 Ways to Lead by Example / Lead by Example

Paraphrasing Carl Golden on the ways of the practice named "Lead by Example" refers to the following ten requirements:

Take responsibility for the facts. The mistake costs credibility, maintains team members in defensive, and eventually on sabotages the real development of individuals.

Be honest. Incorrect representation of facts, phenomena and processes is likely to affect everyone. A leader must show that in all circumstances honesty is the best policy.

You must prove that you are brave. First you have to go through fire (or attend in a crisis) – so have your own experience. Generally, the calculated risks demonstrate the individual's commitment to a more general, broader goal.

Recognize your failure. It is good for the team you are leading to do the same and have the ability to define failure as part of an extraordinary individual making process.

Be consistent. The idea is to repeat attempts to solve a problem. On is advisable to go either under or around any obstacles to show to the team which you are leading that the obstacles do not define the institution or team.

Create solutions. Do not focus on the issues that is possible / may arise. You have a top position and that is why you have to offer solutions; only after then you will consult the team to develop more solutions.

Listen. Ask questions. Try to understand. You will receive valuable information and be sure to set a such tone that encourages a healthy dialogue.

Delegate / authorize with freedom. It is very important to encourage an atmosphere where team members can focus on their strengths.

Take care of yourself. As an exercise, be careful not to overwhelm, so take a break. A balanced team, mentally and physically, is a successful team. Consequently, model it, encourage it and support it!

Raise your sleeves. Following the model of Alexander the Great, who led his men in battle, you will be able to inspire greatness in your institution.

Source: „Top 10 Ways to Lead by Example”
by Carl Golden, http://www.soulcraft.co/essays/lead_by_example.html

Through this practice – "Top 10 Ways to Lead by Example" – the existing management of the research units can educate new leaders through their personal example. The adoption of the mentioned technique asks: (i) to identify models of success from agricultural and forestry research; (ii) to recognise them; (iii) to try to disseminate this things to the people from the scientific and academic environment, and in the business ones, also. Thus, identified leaders from the research sector can become and represent a model of inspiration for young people, and , at the same time, they can contribute to the development of the motivations to other representatives of the agricultural and forestry research environment, but also, for the academic environment, in general.

The initiation of a *National Recognition and Training Program for New Leaders within Agricultural and Forestry Research*, people who excels in these areas of reference, is likely to: (a) induce positive effects at institutional level and in specific universities; (b) contribute to the reinvigoration of human research resources; (c) contribute to the credibility, on new bases, of existing human resources; (d) contribute to promoting the values of social

responsibility of agronomic research towards rural areas as a whole; (e) attract new young people in agricultural and forestry research and on this way it contribute indirectly to the performance gains by specific universities.

2.3. Speeding the materialization of measures to increase the attractiveness of the research career from the "National Strategy for Research, Development and Innovation 2014-2020 "

It seems that the organizational and financial issues (There is a delay in clarifying the application the provisions of the Law on Scientific Research. According to the law for the reorganization of the research institutes /centers, 48 government decisions had to be made and approved. During 2009-2016 only two Gocernamental Decisions (GDs) were formulated and approved to reorganize agricultural research. Other 46 GDs were completed only in the summer of 2017 and they are in the process of being approved.) have occupied all the interest of the agriculture and forestry R & D institutes, it explains why their inclusion in the programmatic documents and in their own management programs continue to stay on the second level of interest or even them were postponed.

The National Research, Development and Innovation Strategy 2014-2020 included a chapter dedicated to the research labor market. In this document, starting from the realities, designed directions to be followed by research activities regarding the access of young doctoral students and fresh doctors in science to a research career remains relatively limited.

The measures related to the exchange of research personnel between public and private organizations is today only "accidental", also (There is a delay in clarifying the application the provisions of the Law on Scientific Research. According to the law for the reorganization of the research institutes /centers, 48 government decisions had to be made and approved. During 2009-2016 only two Gocernamental Decisions (GDs) were formulated and approved to reorganize agricultural research. Other 46 GDs were completed only in the summer of 2017 and they are in the process of being approved.)

The mentioned document proposes measures to increase the attractiveness of the research career as well as a partial rethinking of the present doctoral training system.

Therefore, increasing of the internal and international mobility of young researchers and teachers included the following measures:

- Integration of doctoral students and young doctors in the science into the RDI projects;
- Attracting researchers from abroad to project management in host institutions from Romania;
- Obligation of public research organizations to publish and disseminate all their available jobs on the EU Platform Euraxess There is a delay in clarifying the application the provisions of the Law on Scientific Research. According to the law for the reorganization of the research institutes /centers, 48 government decisions had to be made and approved. During 2009-2016 only two Gocernamental Decisions (GDs) were formulated and approved to reorganize agricultural research. Other 46 GDs were completed only in the summer of 2017 and they are in the process of being approved);
- Duty of public research organizations to accede to the Research Charter and to The European Code of the Researcher (<http://ec.europa.eu/euraxess/index.cfm/rights/whatIsAResearcher>);
- Legalizing of the electronic identity of researchers in view to facilitate their access to the digital services for the research and development activities;

- In order to increase the transparency of the researchers community, on recommends to set-up the Romanian Researchers Register, including Romanian people from abroad who participates in local projects, also.

Also, to increase the degree of internationalization of Romanian research, the presence of innovative products made in the country on international markets, as well as to achieve the global opening of the national RDI market it will be necessary to increase work of the R & D institutes from agriculture and forestry to attract public funds in view to attend to European or international initiatives, bodies, programs or infrastructures.

By "The National Strategy for Research, Development and Innovation 2014-2020" regarding the guarantees of public co-financing research activities by the State Budget for participation in Horizon 2020 projects, as well as, of the other types of institutional partnerships, "joint departments", or of the use of other international instruments in the field of RDI. Thus, among the main measures co-financed by public funds through the "National Strategy for Research, Development and Innovation 2014-2020" and to which the agricultural research should be oriented, on can mention:

- Participation of the research units in the Horizon 2020 projects;
- Participation in European initiatives such as Joint Programming Initiatives (JPIs), Joint Technology Initiatives (JTIs) / European Innovation Partnerships (EIPs);
- Participation in collaborations within third countries;
- Participation in international bodies (the European Organization for Nuclear Research - CERN, European Space Agency portal features the latest news in space exploration, human spaceflight, launchers, telecommunications, navigation, monitoring and space science – ESA, etc.) within mutually agreed integrated plans with others entities;
- Calls for financing of bilateral projects;
- Developing and creating synergies – through "twinning" and "teaming" projects (at the level of emerging centers of excellence, innovative regions, innovative clusters from Romania and the EU) – within the research-development- innovation (RDI) programs, which are managed from the central level by the European Union; In this context, the partnerships for top research facilities with the laboratories of Magurele, where the Extreme Light Infrastructure (ELI) is being built offer a new infrastructure of world interest and new opportunities among the most diverse interdisciplinary research;
- Establishing the framework "department" ("ERA department") in view to attract famous researchers and / or academics.

Many of these proposals can find a quicker solution, given that the managerial concerns of all actors involved in agricultural and forestry research intend to enhance the identification and implementation of new tools to improve the finance of their activities.

2.4. Development of the public-private partnerships, a prerequisite for attracting and maintaining human resources in agricultural and forestry research in Romania

The essence of the public-private partnership is that it brings together competencies, know-how and management of the private sector with that of public institutions, in this case, of the agricultural and forestry research institutes and centers and the capacity to share the risks between partners ensuring efficiency in the use of funds, also.

Referring to the functionality of the public-private partnership in case of accessing European funds by the agricultural and forestry research institutes and resorts Gh. Sin said: "... Public-private partnership has no clear legislation and our request for clarification at the Ministry of Finance and the Ministry of Justice, drived to confusing answers with remittances from one ministry to another ... "

The public-private partnership is the one that would benefit both to the private operator and to the public sector. Also, the access of Romanian agricultural and forestry research entities to some of the European funds is conditioned by the presence of partnerships with private economic agents. At present, in Romania however, a such legislation is not enough clear. Regarding this issue one can mention that legislative changes have been attempted in 2016 (<http://ec.europa.eu/euraxess/index.cfm/rights/whatIsAREsearcher>), but they failed to strengthen an attractive private-sector partnerships similar to those existing in most of the Member States of the European Union, aiming at: attracting of the private financial resources for the purpose of carrying out public projects; attracting foreign investment; creating new jobs; Improving the performance of public project implementation; reducing the pressure on public finances; increasing participation in attracting European funds, etc.

Conclusions

1. In fact, with European money in Romania comes the principles, the mentality, the different ways to approach the problems of development. The R&D structures from agriculture and forestry will be involved to create real premises for the revitalization of the connections between the existing qualified human resources and the majority of small farms.
2. In order to restructure the existing agricultural and forestry human research resource and to develop the dissemination activities of some products resulting from their activity it is necessary to increase the introduction of the elements from the category "best practices", which can reposition the agricultural and forestry research, priorities both of the "production" of existing research information and knowledge and their future specific activities. In the medium and long term, implementing this types of measure can influence the research institute's partnerships, the choice of future research directions and the additional fund resources of this units.
3. The revival of leadership in agricultural and forestry research institutes and centers has to become one of the major concerns of the management of these institutions. One can appreciate that this action will have to be carried out within the framework of a specific program: *the National Program for the Recognition and Training of New Leaders in the Field of Agricultural and Forestry Research*. This program will act as a tool for bringing together public and private efforts to attract young people into the research activities, as well as, to enhance the performance of young people from universities.
4. To speed up the process to include in the management programmes of research entities from agriculture and forestry the realization of measures to increase the attractiveness of the research career foreseen in the "National Strategy for Research, Development and Innovation 2014-2020" is likely to contribute to increasing the access of young PhD students and fresh doctors in science to a research career, to a broader public research environment to private and foreign researchers in the programs of agricultural and forestry research institutes, as well as to increase of the degree of Romanian research internationalization.
5. Improving the use of human potential in Romanian agricultural and forestry research can also find other sources of inspiration than those of this paper. For example, it should be mentioned that after the accession of Romania to the EU, the main advantage that came together the European funds was the know-how, and not necessarily the material issues. The support of this statement is reinforced by the fact that during the programming period 2007-2013, through the NRDP, approximately 88,000 projects were financed, given that in Romania are 3.8 million small and medium peasant farms or approx. nearly one million of peasant households (if take into account only the entities registered with the Agency for Rural Investment Financing – ARIF/ AFIR). In

this context, projects developed from EU funds must be analyzed by the R&D institutes / departments in view to (i) look after the models of "good practice models" for semi-subsistence and subsistence farms, (ii) to institutionalised them for different regiond and (iii) to transforme them in reference models for a new programation period. In a such way it is possible to reduced the farmer costs for preparing the next projects.

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