Need analysis for knowledge refreshment of agricultural school teachers and extension service advisors in agriculture

TEMPUS Project:
Building Capacity of Serbian Agricultural Education to Link with Society (CaSA)
544072-TEMPUS-1-2013-1-RS-TEMPUS-SMHES
(2013 – 4604 / 001 - 001)

Coordinator:
University of Belgrade, Faculty of Agriculture

WP4 - Modernization of teaching contents
4.1. Need analysis for knowledge refreshment

Belgrade, 2015

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Danijela Šćepanovič

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This brochure is a result of the TEMPUS project "Building Capacity of Serbian Agricultural Education to Link with Society" (CaSA) 544072-TEMPUS-1-2013-1-RS-TEMPUS-SMHES (2013-4604/001-001).

Daniela Šćepanović and Steve Quarrie were responsible for questionnaire construction, assisted by Slavica Čolić.

Analysis of questionnaires was coordinated by Daniela Šćepanović, as well as final preparation and presentation of the results.

For final document preparation, all CaSA Steering Committee members gave valuable contribution.

For brochure final preparation Daniela Šćepanović, Vesna Poleksić and Goran Topisirović were in charge.

CONTENTS

Need analysis for knowledge refreshment

The following report has been prepared within the framework of the TEMPUS project Building capacity of Serbian Agricultural Education to link with Society (acronym CaSA).

CaSA is coordinated by the University of Belgrade with the overall goal to strengthen links between higher education and society by building capacity of all five Serbian Faculties of Agriculture (FA) to improve teachers' competences in pedagogic skills and in their ability to provide eLearning in-service vocational training courses for agricultural secondary school (AMS) teachers and experts in agriculture extension services (AES). The second main pillar of the project consists of networking of all stakeholders in agricultural education and development of a National Repository for Agricultural Education (NaRA).

To reach the desired level of modernization of teaching contents and gain insight into the characteristics of target groups (future trainees), the preparation of two questionnaires for training need analysis was initiated at the beginning of the project.

The questionnaires were designed in close cooperation with the project partners who shared their ideas on knowledge areas and specific topics that needed further inquiry. The questionnaires were also shaped on the basis of the inputs from knowledge exchange gained on a study visit to Faculty of Agriculture and Life Sciences, University of Maribor in May 2014.

The training needs of two groups of professionals were assessed, the first questionnaire targeting Agricultural Middle School Teachers and the second Advisors of Agricultural Extension Services.

The final version of questionnaires was ready for distribution in December 2014. The forms were made available online and filled in by the Agricultural Middle School Teachers and Advisors of Agricultural Extension Services by mid January 2015.

The Questionnaire for Agricultural Middle School Teachers was prepared with the awareness that in-service vocational training in agriculture is part of the national system of professional development of teachers, managed by the Institute of Education Promotion and its Centre for Professional Development of Teachers.

The Questionnaire for Advisors of Agricultural Extension Services was prepared with the awareness that the Institute of Applied Agricultural Sciences (IPN) coordinates the main provision of in-service training for this group of lifelong learners that is funded by the Ministry of Agriculture or Provincial Secretariat for Agriculture.

Data are presented in charts and tables. When used, the percentages were rounded to the nearest whole numbers.

The report is primarily designed for use by trainers and instructional designers in the sector of agricultural education as an input for the preparation of blended (online and face to face) in-service training programs.

Presentation of results - Advisors of Agricultural Extension Services

Advisor age groups and working experience

The first group of respondents was Advisors of Agricultural Extension Services employed in the Extension Services across all regions of Serbia. There were 216 professionals (84%), out of 257 who filled in the questionnaire; among which 56 % were men (N=119) and 44 % (N=93) were women.

The respondents were subdivided into Age groups. The majority falls into the age group from 40 to 49 years (47%), followed by the two second-largest categories from 50 to 59 years (26%) and from 30 to 39 (19%). Two smallest categories are represented by 4% of Advisors under 25 and 4% above 60 years of age, Chart 1.

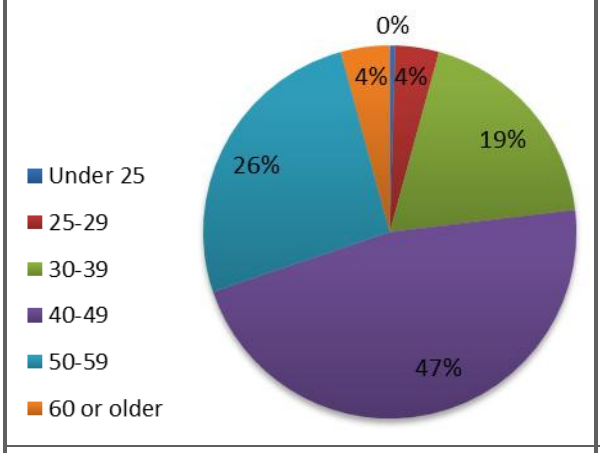


Chart 1. Age Groups

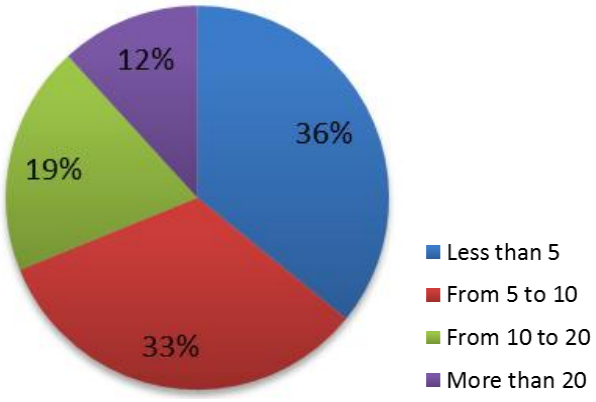


Chart 2. Work Experience in Years

Chart 2 presents the working experience of Advisors working in the current position in years. The majority has less than 5 (36%) or from 5 to 10 (33%) years of experience. In total, 69% of them have less than 10 years of experience working as Advisors in Agricultural Extension Services. There are 12% who have been working more than 20 years.

Recommendations

When designing online or blended course, be aware that all age groups are able to participate in the online instruction efficiently in contrast to the widespread assumption that there is a strong divide between age groups. The divide into digital immigrants, those borne prior 1980 and digital natives who are young people living their lives completely immersed in technology, “fluent in the digital language of computers, video games and the Internet” (*Bennett*, 2008) is under debate and such generalizations have been almost abandoned.

Nevertheless a higher level of digital competency of the teacher and participants will make the online learning experience more engaging and effective. Digital competency is a "moving target" that develops gradually and the important prerequisite for all engaged in online education and in-service training is positive attitudes towards acquiring new, ICT knowledge and skills.

The group of Advisors with more than 20 years of experience can be seen as the potential pool of Extension experts who can be engaged in mentoring of newly employed e.g. for preparing guidelines, conducting workshops, targeting the large proportion of those with less than 5 years of experience.

Defining training formats

Advisors were asked to select the format of training that suits them the most or that they are interested in. The preferred training format, by 61% of respondents, is **blended learning** (mixed, hybrid) that combines online and face-to-face instruction formats when participating in in-service training.

There is still a significant group of respondents (34%) who prefer face to face trainings (in the classroom or other facility) and a small group of respondents (5%) who prefers fully online courses (using ICT), Chart 3.

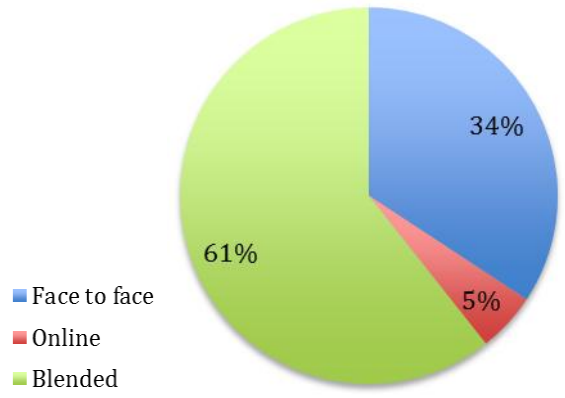


Chart 3. Training Format

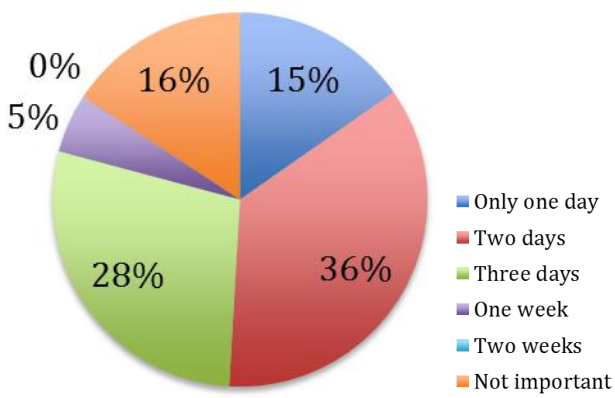


Chart 4. Preferred Length of Training

Advisors were asked to select the preferred length of training. The majority is interested in training that lasts **two** (36%) **or three days** (28%). One day training is the preferred option for only (15%) of them, similar to the percentage of those that consider Length of Training as not important for their participation (16%). Only (5%) of respondents are willing to spend one week on training and there are no respondents interested in training that lasts two weeks, Chart 4.

Advisors were asked to select the preferable length of training in hours during one day of a training course. A small majority (51%) selected up to 8h and (42%) up to 4h. Only (7%) consider that length in hours is not important for their participation, Chart 5.

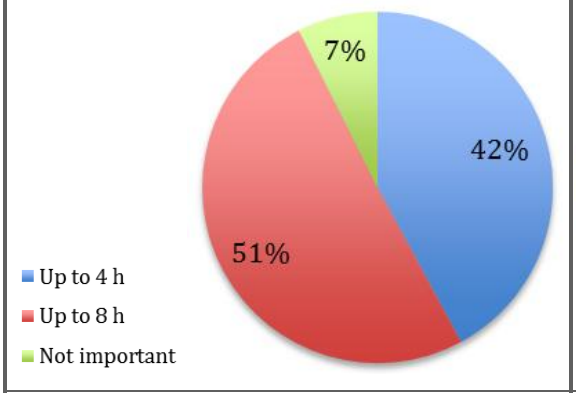


Chart 5. Length of Training in Hours per Day

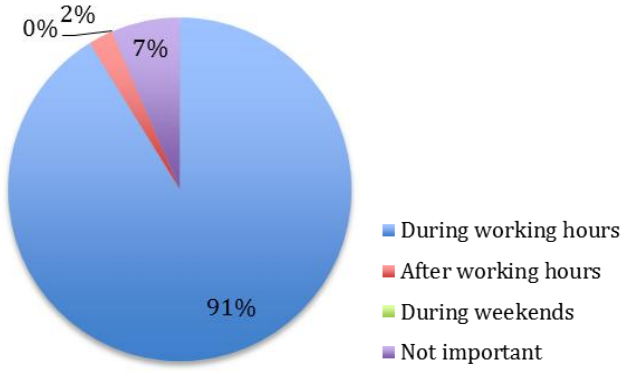


Chart 6. Training Availability

Chart 6 represents the suitable training time for Advisors. They expressed high interest to participate in training during working hours (91%), in contrast to only (2%) who would prefer to get trained after working hours. There are only (7%) of respondents who find this as not important for their participation and there are no respondents who would prefer to get trained during weekends.

Recommendations

Consider designing training for Advisors that lasts up to three days, preferably 2 days, up to 6 hours per day, during working hours. In case you need to organize training during weekends, consider including a range of motivation tools such as attractive location, leisure time, and a cultural or networking event as an additional offer during the training course.

In the next round of Training Needs Assessment e.g. in the framework of NaRA, it is worthwhile to consider additional questions to be asked about the preferred share of face-to-face training, online training and field visits.

Self-evaluation of work performance and attendance of trainings other than those coordinated by IPN

Advisors were asked to self-evaluate their work performance. There are (66%) of respondents who are satisfied and (18%) highly satisfied with their work performance, altogether (84%). There are only (15%) satisfied to some extent and only (1%) those who are not much satisfied. None of the respondents chose the “not at all” option, Chart 7.

Advisors were asked about their previous experience with continuing education training or in-service training course in the last two years beside those organized by the Ministry of Agriculture or Provincial Secretariat for Agriculture, Water management and Forestry. The majority (86%) answered that they have attended such trainings and (14%) have not.

They were also asked to write the name of the program that they consider of the highest value to their work. There were nearly 70 different titles of seminars listed in the database. Having insight into the titles of seminars, we concluded that the majority of the listed programs actually are those coordinated by IPN and organized by the Ministry of Agriculture or Provincial Secretariat for Agriculture, Water management and Forestry. There is an assumption that either Advisors are not thoroughly informed about the organizational structure and procedures regarding training provision or the question was not formulated clearly. Therefore we have to consider data in Chart 8 as not relevant.

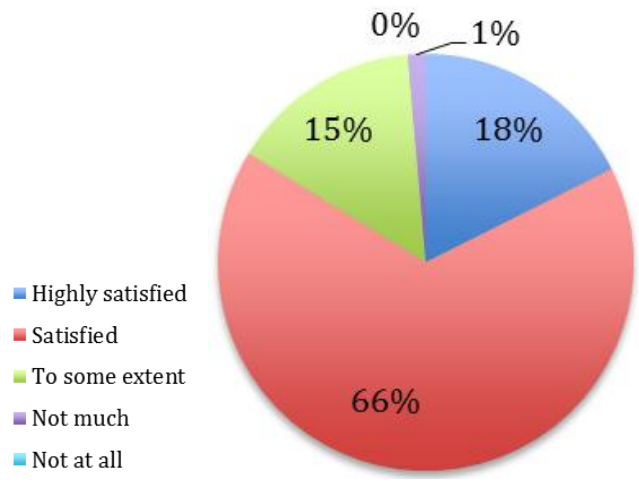


Chart 7. Self-evaluation of Work Performance

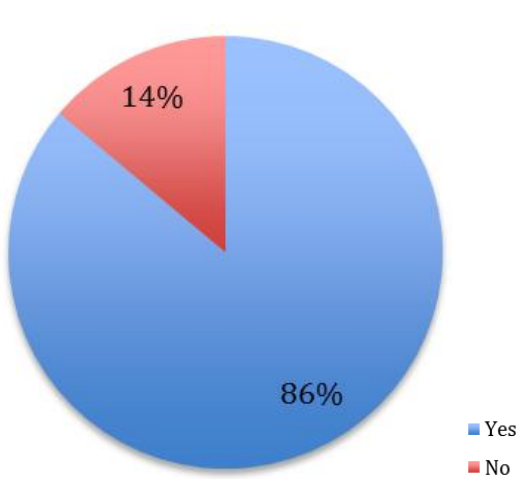


Chart 8. Other Relevant Trainings

Recommendation

In the next version of the Training Needs Assessment the question about other relevant training should be specified in a manner that is clear to Advisors.

Training needs in soft skills, ICT and English language

In this section of the questionnaire, Advisors were asked to rate their knowledge and skills relevant for the current job with respect to different soft skills, ICT and knowledge of the English language.

Advisors rated their Communication skills (ability to actively listen, articulate ideas in writing and verbally to any audience) as Good (51%), Very good (39%), Average (9%) and Fair (1%). None of the respondents chose the option “Poor”, Chart 9.

Advisors rated their Teamwork skills (ability to work effectively with others) as Very good (51%), Good (42%), Average (6%) and Fair (1%). None of the respondents chose the option “Poor”, Chart 10.

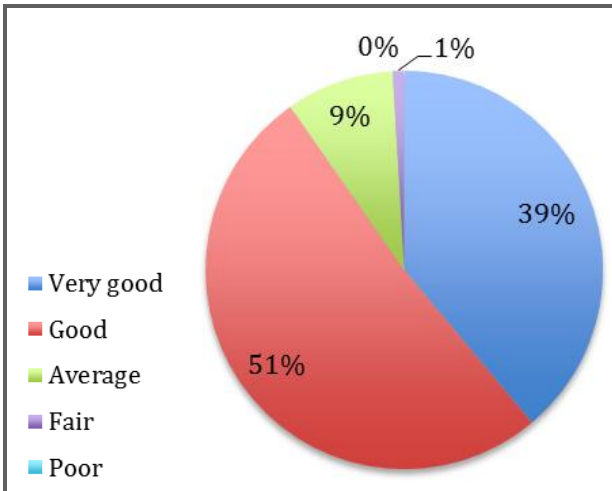


Chart 9. Communication Skills

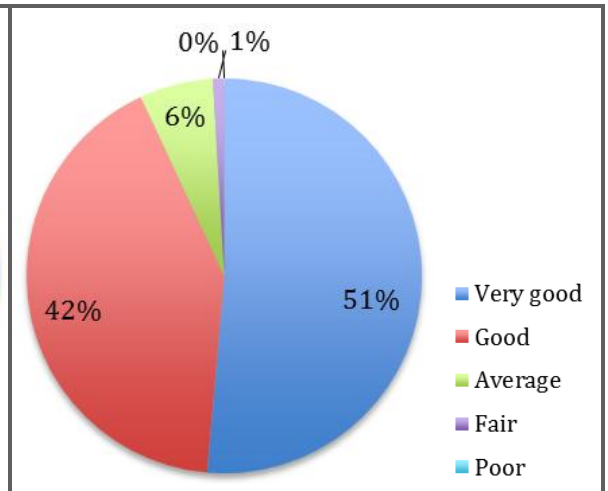


Chart 10. Team Work Skills

Advisors rated their Presentation skills (effectively presenting your work results and ideas to a range of audiences) as Good (52%), Very good (39%), Average (7%) and Fair (2%). None of the respondents chose the option "Poor", Chart 11.

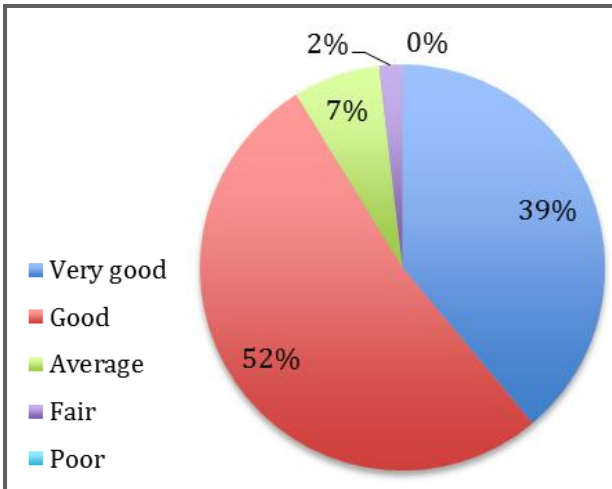


Chart 11. Presentation Skills

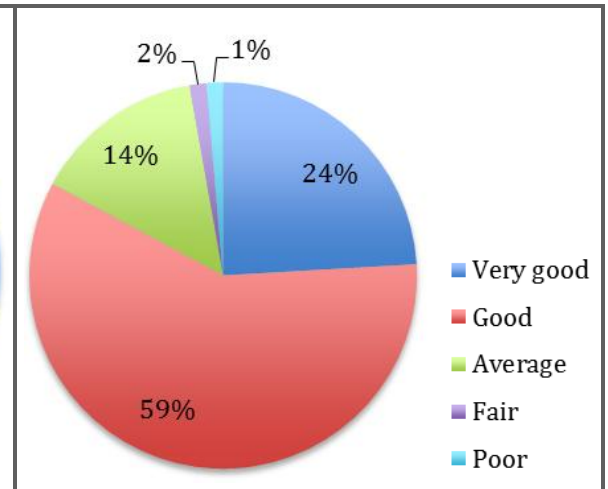


Chart 12. Managing Meetings

Advisors rated their skills for Managing meetings (leading a meeting efficiently and effectively to achieve results) as Good (59%), Very good (24%), Average (14%) and Fair (2%). None of the respondents chose the option "Poor", Chart 12.

Advisors rated their Self-management skills (managing their time and activities effectively) as Good (51%), Very good (40%), Average (7%) and Fair (2%). None of the respondents chose the option "Poor", Chart 13.

Advisors rated their Mentoring/coaching skills (providing constructive wisdom, guidance, and/or feedback in a polite manner) as Good (52%), Very good (41%), Average (6%) and Fair (1%). None of the respondents chose the option "Poor", Chart 14.

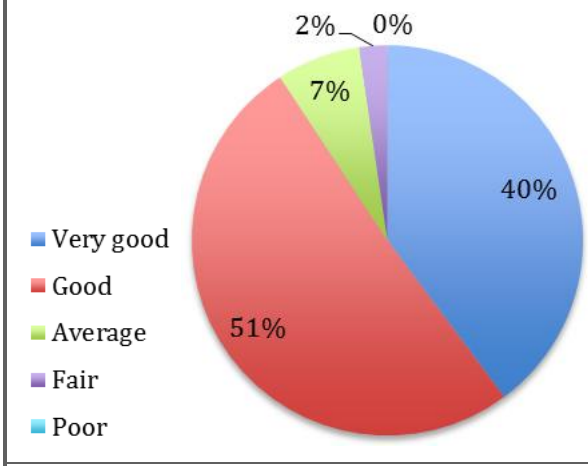


Chart 13. Self-management Skills

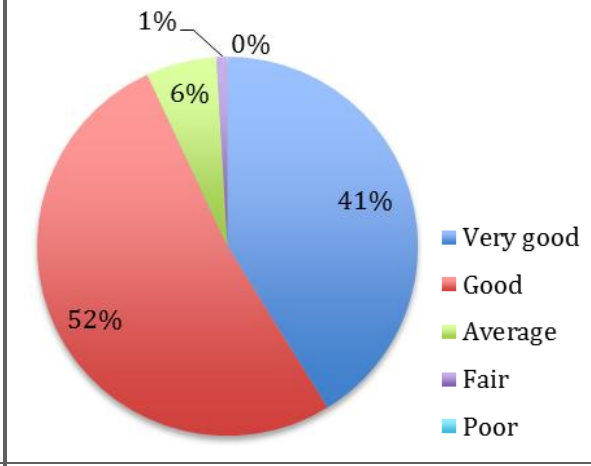


Chart 14. Mentoring/coaching skills

Advisors rated their Negotiation skills (being able to understand the other side's motivations and reach a win-win resolution) as Good (48%), Very good (40%), Average (11%), Fair (1%). None of the respondents chose the option "Poor", Chart 15.

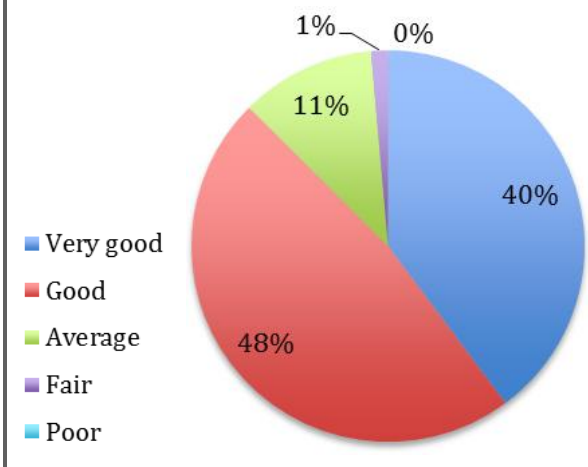


Chart 15. Negotiation Skills

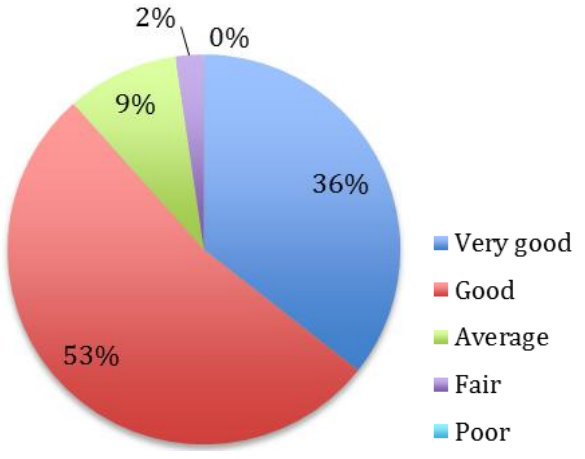


Chart 16. Assessing AH Needs

Advisors rated their knowledge on Methodology of the diagnostic examination and assessment of the needs of agricultural holdings (AH) as Good (53%), Very good (36%), Average (9%) and Fair (2%). None of the respondents chose the option "Poor", Chart 16.

Advisors rated their knowledge on Networking skills (being able to develop useful relationships with others) as Good (49%), Very good (41%), Average (8%) and Fair (2%). None of the respondents chose the option "Poor", Chart 17.

Advisors rated their knowledge on Critical thinking (being able to assess the validity and importance of information) as Good (55%), Very good (35%) and Average (10%). None of the respondents chose the options "Poor" and "Fair", Chart 18.

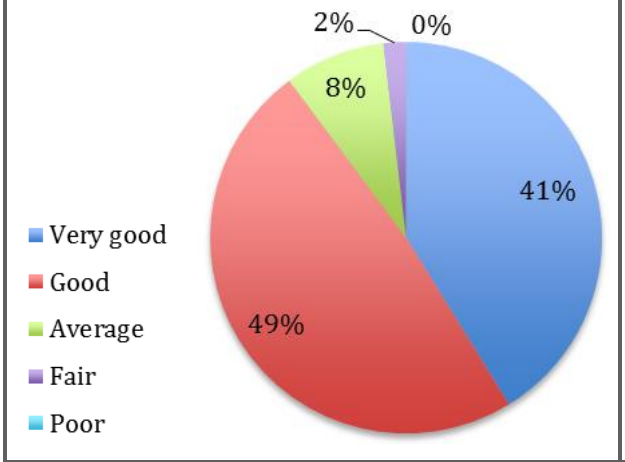


Chart 17. Networking Skills

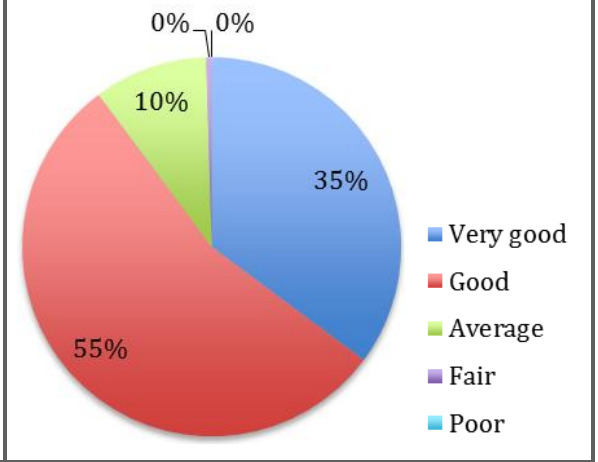


Chart 18. Critical Thinking

Advisors rated their knowledge on ICT skills (being able to use computers in order to access, store, create and share information) as Good (56%), Very good (25%), Average (15%), Fair (3%) and Poor (1%), Chart 19.

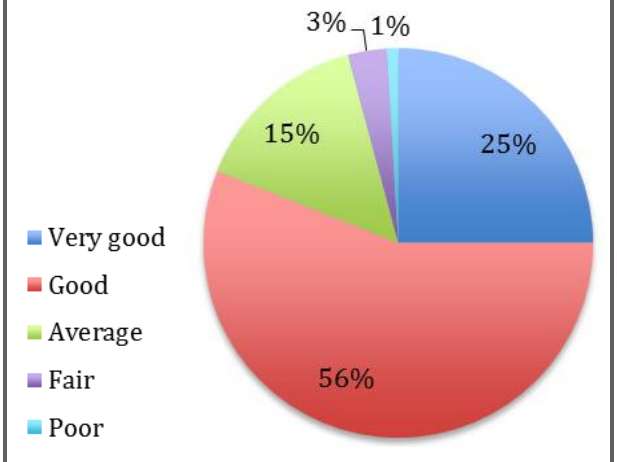


Chart 19. ICT Skills

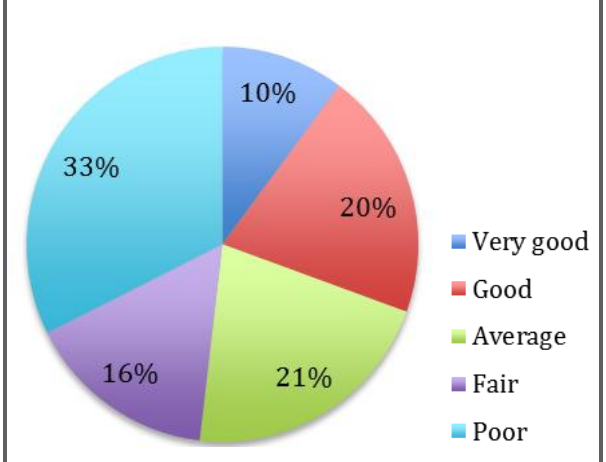


Chart 20. English Language

Advisors rated their knowledge on the English language (speaking and reading English language) as Poor (33%), Average (21%), Good (20%), Fair (16%) and Very good (10%), Chart 20.

Recommendations

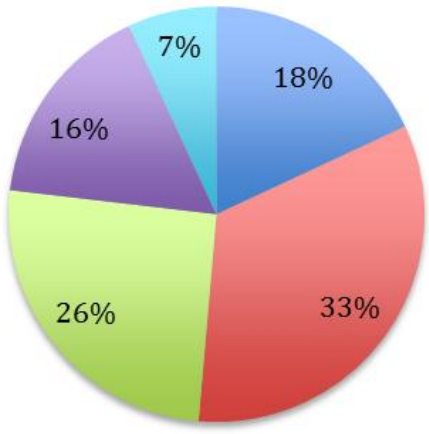
In general, Advisors rated all of the listed soft skills as good and very good except in the case of their knowledge of English. There are several future scenarios that may be proposed and discussed:

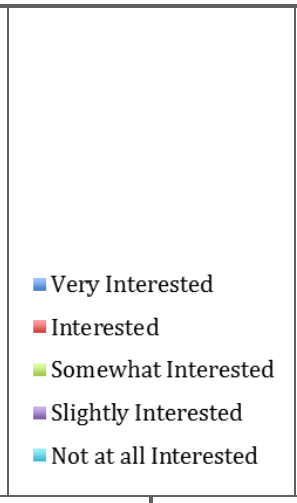
- Advisors could be offered the opportunity to present best practices and experiences worth sharing to other colleagues regarding their work, with attention given to the selected soft skills, tools, methods they use.
- Advisors' training needs could be subject to further research that would include interviews and/or testing a new, more detailed questionnaire structured around case studies.
- Advisors could be offered examples of tools that help enhancing soft skills and Extension advice organized as side event during seminars on other topics.

Interest for participation at trainings in subject areas

Advisors expressed their interest to receive training in Rural tourism. Results were Interested (33%), Somewhat Interested (26%), Very Interested (18%), Slightly Interested (16%) and Not at all Interested (7%), Chart 21.

In Training on Traditional Products there are Interested (45%), Very Interested (21%), Somewhat Interested (18%), Slightly Interested (10%) and Not at all Interested (6%), Chart 22.





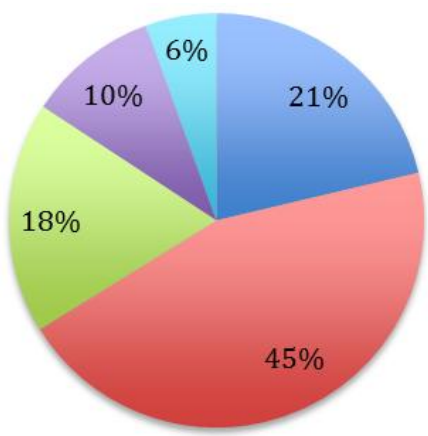


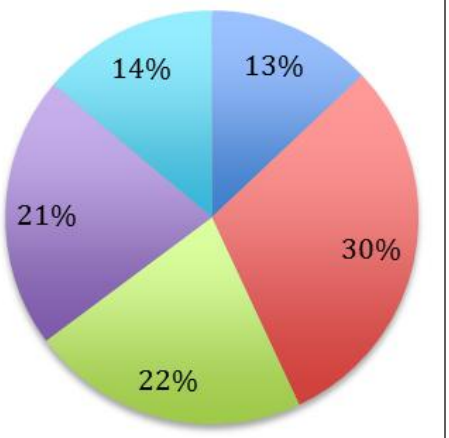
Chart 21. Rural Tourism

Chart 22. Traditional Products

In Training on Women Associations there are Interested (30%), Somewhat Interested (22%), Slightly Interested (21%), Not at all Interested (14%) and Very Interested (13%), Chart 23.

In Training on Renewable Energy there are Very Interested (38%) and Interested (38%), Somewhat Interested (15%), Slightly Interested (5%) and Not at all Interested (4%), Chart 24.

In Training on Good Agricultural Practice (GAP) there are Very Interested (50%), Interested (40%), Somewhat Interested (4%), Slightly Interested (3%) and Not at all Interested (3%), Chart 25.



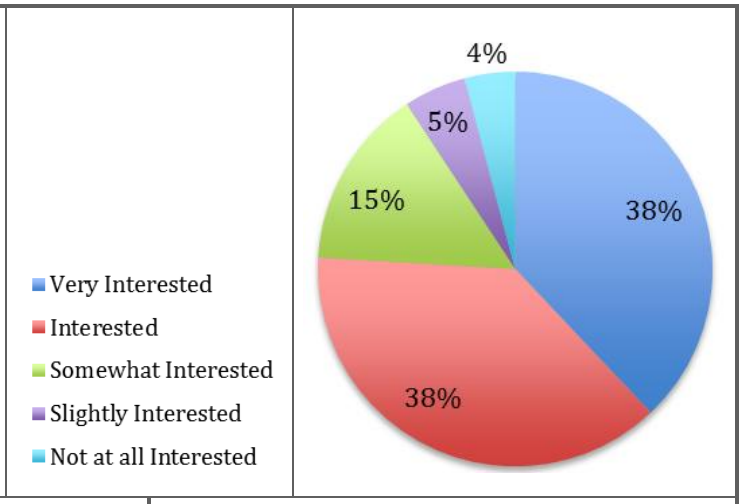
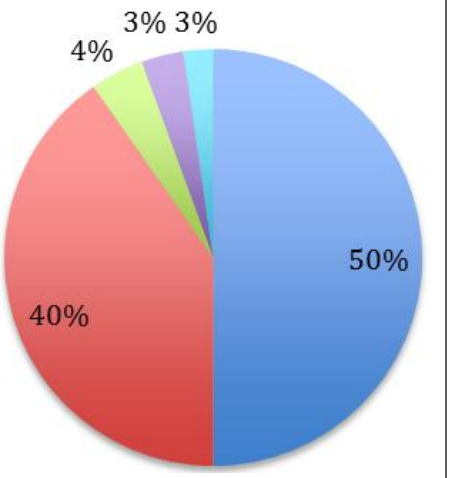


Chart 23. Women Associations

Chart 24. Renewable Energy

In Training on Food Safety there are Very Interested (61%), Interested (31%), Somewhat Interested (5%), Slightly Interested (3%). None of the respondents chose the "Not at all Interested" option, Chart 26.



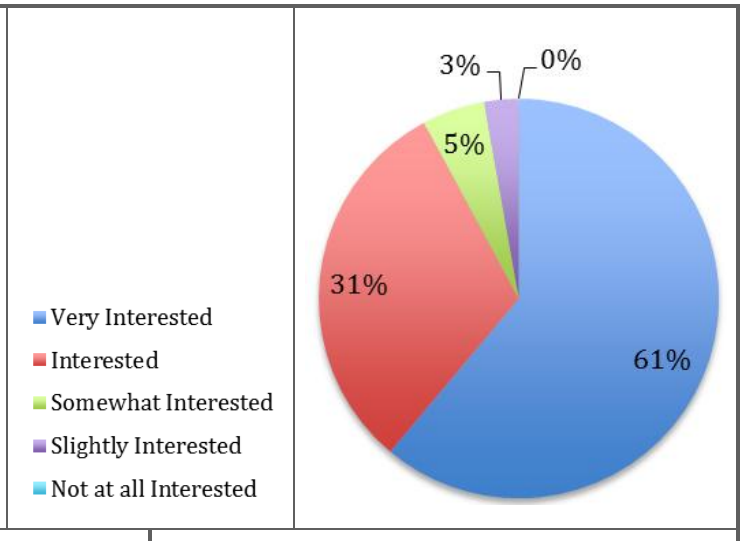


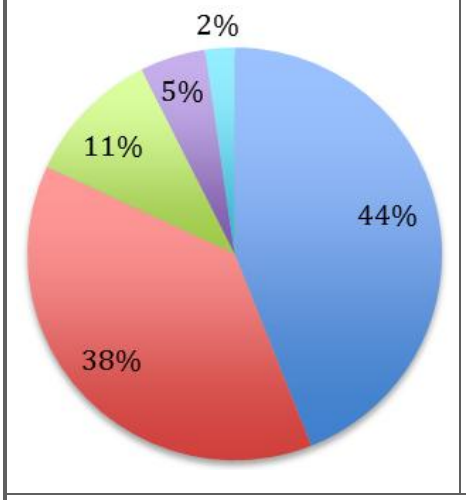
Chart 25. Good Agricultural Practice

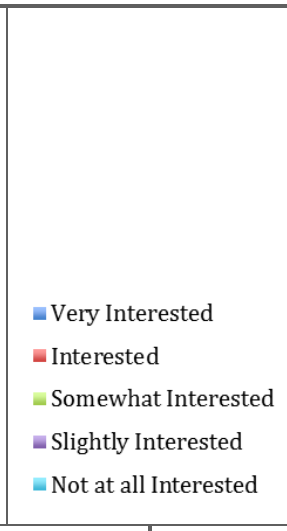
Chart 26. Food Safety

In Training on EU legislation in the field of agriculture there are Very Interested (44%), Interested (38%), Somewhat Interested (11%), Slightly Interested (5%), and Not at all Interested (2%), Chart 27.

In Training on Environment protection there are Very Interested (59%), Interested (34%), Somewhat Interested (4%), Slightly Interested (3%). None of the respondents chose the "Not at all Interested" option, Chart 28.

In the table below data are presented to compare results for the groups of Advisors who are: Very Interested and Interested in a given topic.





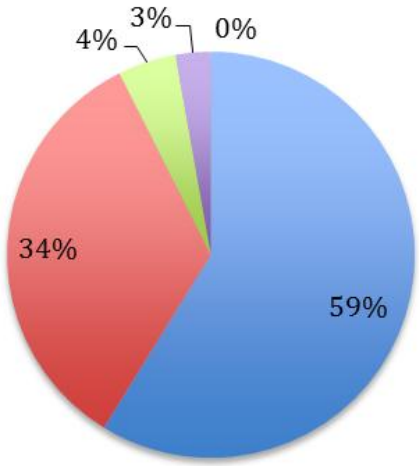


Chart 27. EU legislation in agriculture

Chart 28. Environment protection

Areas	*Very Interested (%)*	*Interested (%)*	*Total (%)*
Rural tourism	18	33	51
Traditional Products	21	45	66
Women Associations	13	30	43
Renewable Energy	38	38	76
Good Agricultural Practice	50	40	90
Food Safety	61	31	92
EU Legislation in Agriculture	44	38	82
Environment Protection	59	34	93

Preferred training topics within Agricultural production systems

In the next section the Advisors were asked to select preferred training topics within the five agricultural production systems. Distribution of Advisors interests is: Crop and Vegetable Production (28%), Animal Husbandry (22%), Fruit growing (22%), Phytomedicine (18%), Agricultural Economy (10%).

Crop and Vegetable production

Advisors who selected Crop and Vegetable production expressed their interest in training on Conventional (47%), Integral (38%) and Organic (15%) types of production, Chart 29.

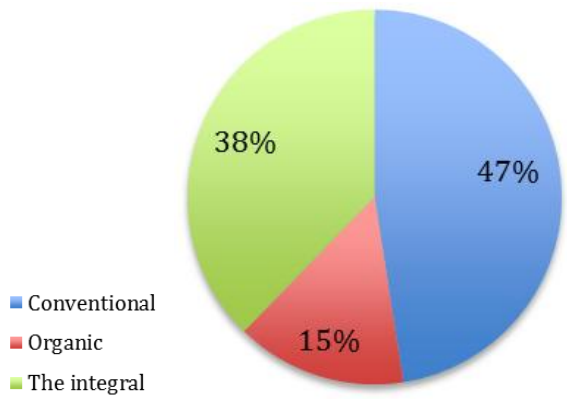


Chart 29. Type of Production

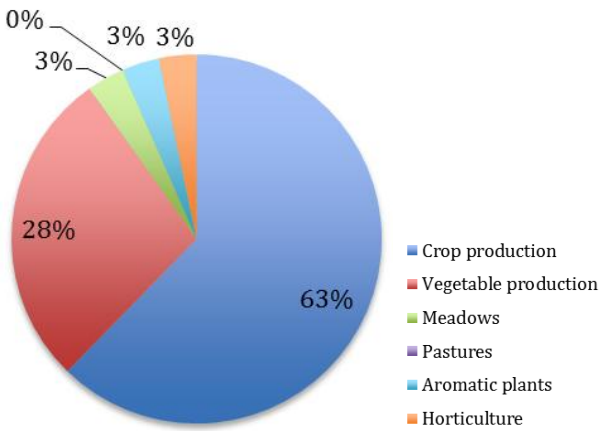


Chart 30. Areas

Advisors who selected Crop and Vegetable production expressed their interest in training on Crop production (63%), Vegetable production (28%), Meadows (3%), Aromatic plants (3%) and Horticulture (3%). None of the respondents chose the option "Pastures", Chart 30.

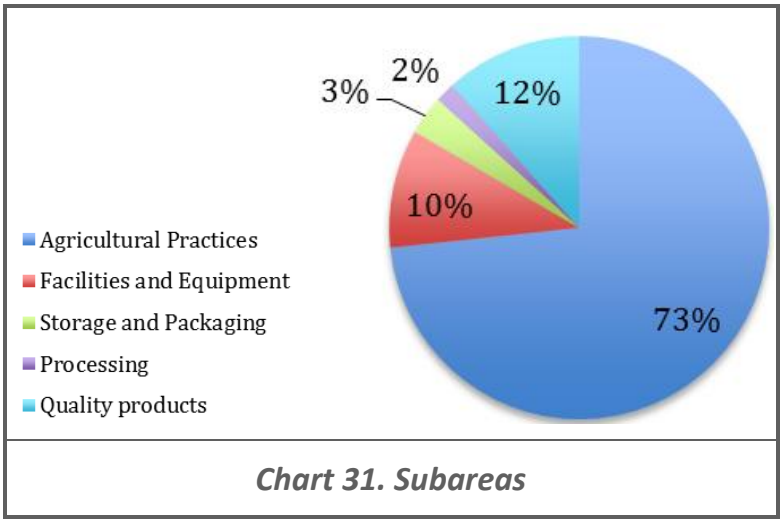


Chart 31. Subareas

Advisors who selected Crop and Vegetable production expressed their interest in training on Subareas: Agricultural Practices (73%), Quality of products, products with added value and food safety (12%), Facilities and Equipment (10%), Storage and Packaging (3%) and Processing (2%), Chart 31.

Animal Husbandry

Advisors who selected Animal Husbandry expressed their interest in training on Conventional (90%) and Organic (10%) type of production, Chart 32.

Advisors who selected Animal Husbandry expressed their interest in training on Livestock (71%), Sheep (15%), Pig (6%), Goat (4%), Poultry (2%), Horse rearing (2%). None of the

respondents chose options “Beekeeping”, “Aquaculture” and “Breeding of small animals”, Chart 33.

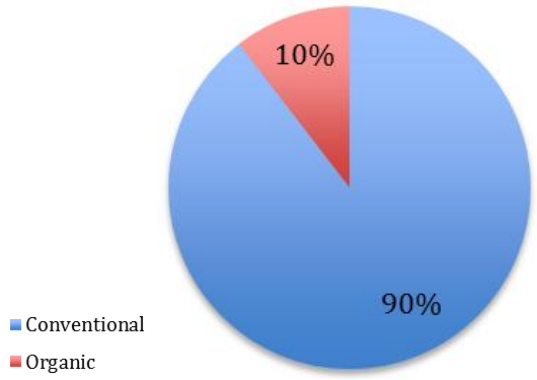


Chart 32. Type of Production

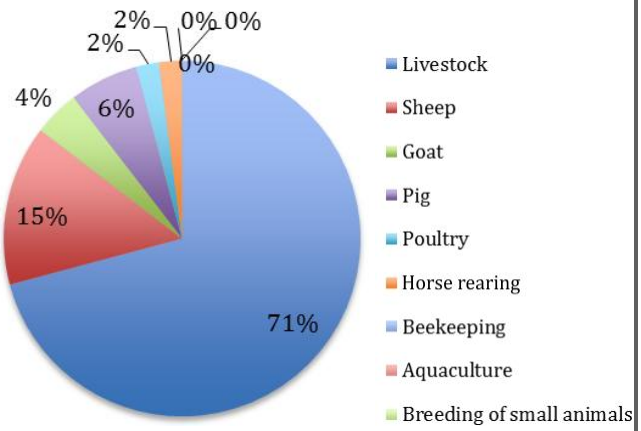


Chart 33. Areas

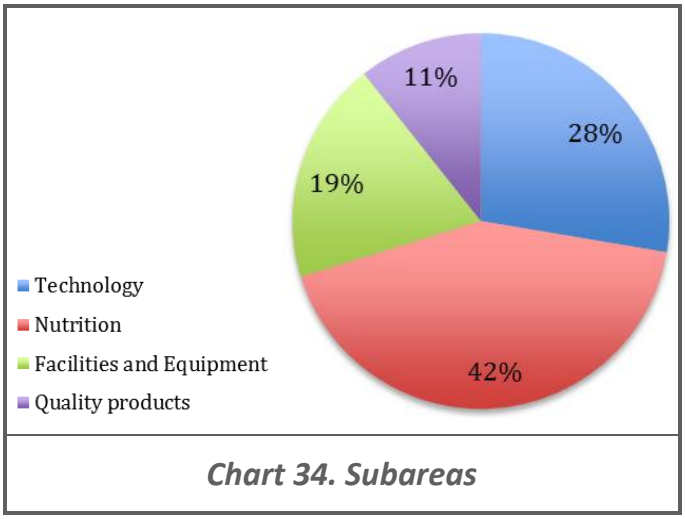


Chart 34. Subareas

Advisors who selected Animal Husbandry expressed their interest in training on Subareas: Nutrition (42%), Technology of animal production and breeding (28%), Facilities and Equipment (19%) and Quality of products, products with added value and food safety (11%), Chart 34.

Fruit growing

Advisors who selected Fruit growing expressed their interest in training on Conventional (45%), Organic (30%) and Integral (25%) type of production, Chart 35.

Advisors who selected Fruit expressed their interest in training on Pome fruits (26%), Vine production (24%), Small (berry) fruits (20%), Nuts (15%) and Stone fruits (15%) areas, Chart 36.

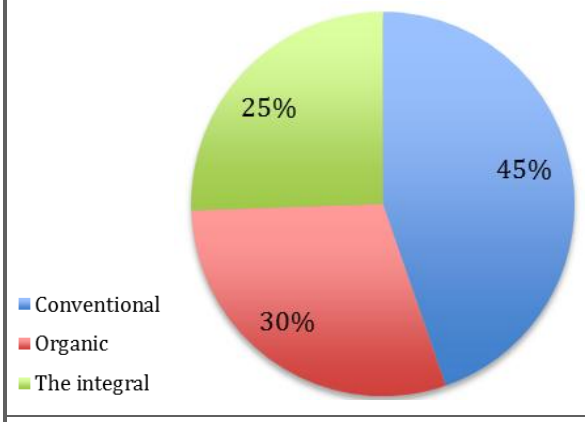


Chart 35. Type of Production

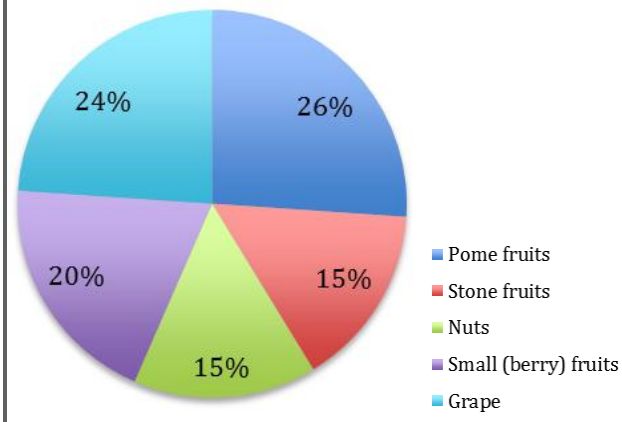


Chart 36. Areas

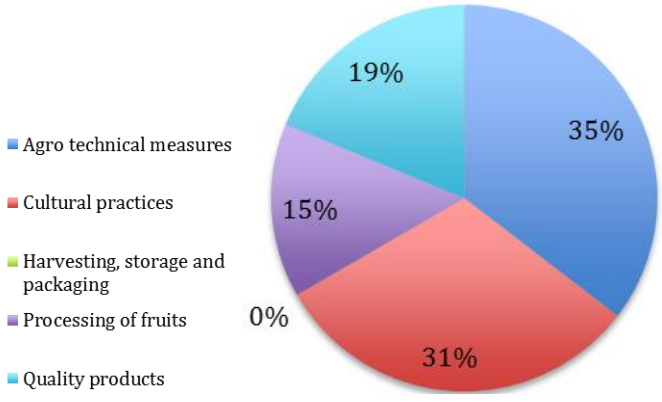


Chart 37. Subareas

Advisors who selected Fruit expressed their interest in training on Subareas: Agro technical measures (35%), Cultural practices (31%), Quality of products, products with added value and food safety (19%) and Processing of fruits (15%). None of the respondents chose the option "Harvesting, storage and packaging", Chart 37.

Phytomedicine

Advisors who selected Phytomedicine expressed their interest in training on Integral (64%), Conventional (26%) and Organic (10%) types of production, Chart 38.

Advisors who selected Phytomedicine expressed their interest in training on the areas Protection of fruit trees (58%), Protection of vegetable crops (21%), Protection of field crops (13%), Grape wine protection (5%) and Protection of ornamental plants (3%). None of the respondents chose the option "Protection of stored products", Chart 39.

Advisors who selected Phytomedicine expressed their interest in training on Subareas: Phytopathology (53%), Pesticides (26%), Entomology (13%), Herbology (8%). None of the respondents chose the options “Acarology” or “Zoology”, Chart 40.

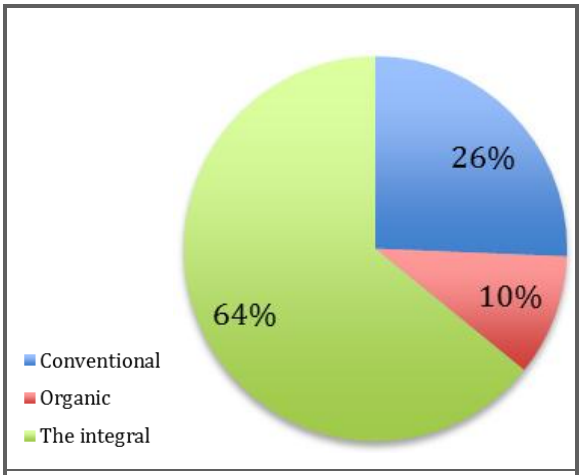


Chart 38. Type of Production

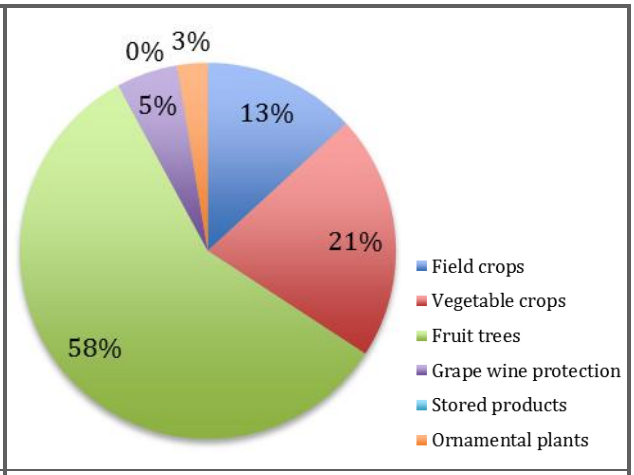


Chart 39. Areas

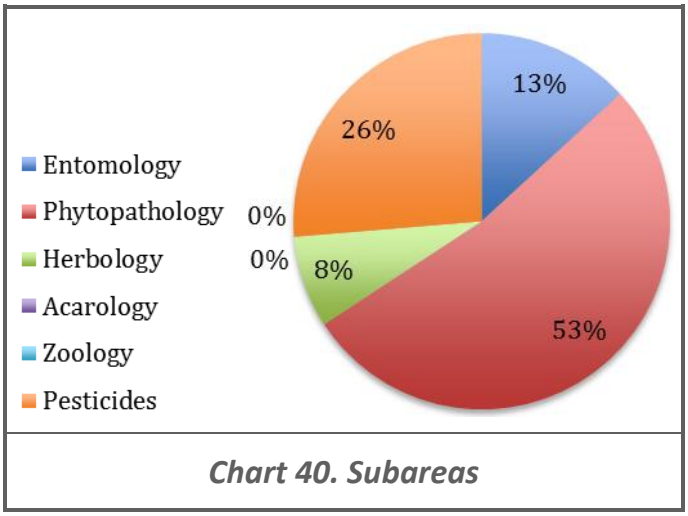


Chart 40. Subareas

Agricultural Economy

Advisors who selected Agricultural Economy expressed their interest in training on Subareas: The use of EU funds (50%), Agricultural associations (30%), Marketing of agricultural products (10%), Financing agricultural production (5%) and Agricultural loans (5%). None of the respondents chose the options “Farm Management” and “Farm diversification”, Chart 41.

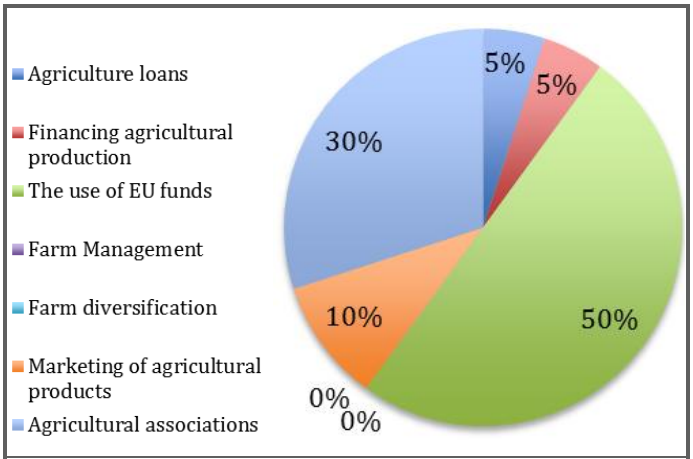


Chart 41. Agricultural Economy

Recommendations

Data presented in the report could be further used to prepare a detailed analysis of the needs in selected areas e.g. Agricultural Economy. Decisions on the course subject and training design should reflect key objectives of the EU common agricultural policy and national agricultural policy e.g. strengthening the position of women in rural agricultural economies. It is worth considering combinations of several topics that are connected by common criteria e.g. Organic farm management.

Presentation of the results – Agricultural Middle School Teachers

Teachers age groups and working experience

The second group of respondents was Agricultural Middle School Teachers working in the area of agriculture, food processing and food production, employed in VET schools across all regions of Serbia. There were 189 professionals who filled in the questionnaire; among which 64% (N=113) were women and 36% were men (N=64).

The respondents were subdivided into Age groups. The majority falls into the age group from 40 to 49 years (41%), followed by the second largest category from 50 to 59 years (35%) and from 30 to 39 (18%). The two smallest categories are represented by 3% of Teachers between 25 and 29 and 3% above 60 years of age. There are no teachers' under 25 years of age, Chart 1.

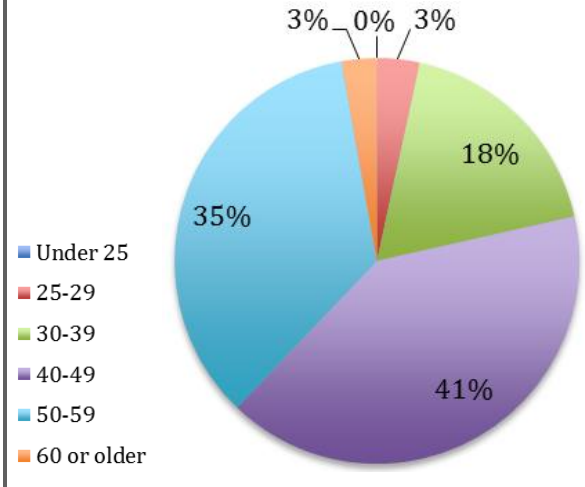


Chart 1. Age Groups

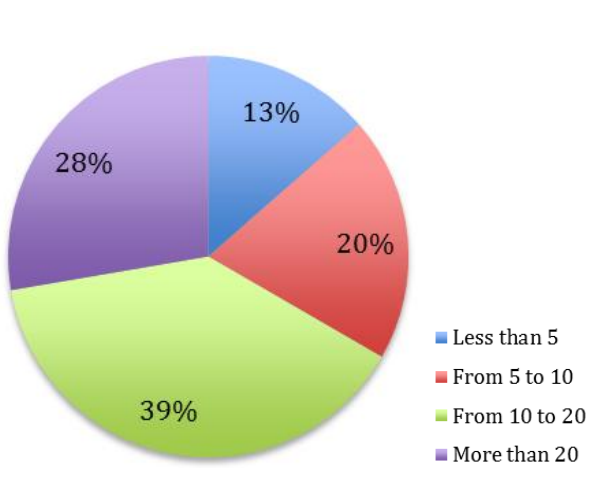


Chart 2. Working Experience (years)

Chart 2 shows the working experience of Teachers working in their current position in years. The majority has from 10 to 20 years of experience (39%), then the groups with more than 20 years (28%), from 5 to 10 years (20%) and less than 5 years of experience (13%).

Defining training formats

Teachers were asked to select the format of training that suits them the most or which they are interested in. The preferred training format by 58% of respondents is **blended learning**.

There is still a significant group of respondents (31%) who prefer face to face trainings (in the classroom or other facility) and a group of respondents (11%) prefers fully online courses (using ICT), Chart 3.

Teachers were asked to select the preferred length of training. The majority is interested in training that lasts **two days** (36%). The second largest group of respondents considers the length of training as not important for their participation (24%). One day training is the preferred option for 16% of them. Only 5% of respondents are willing to spend one week on training and there are 2% of respondents interested in training that lasts two weeks, Chart 4.

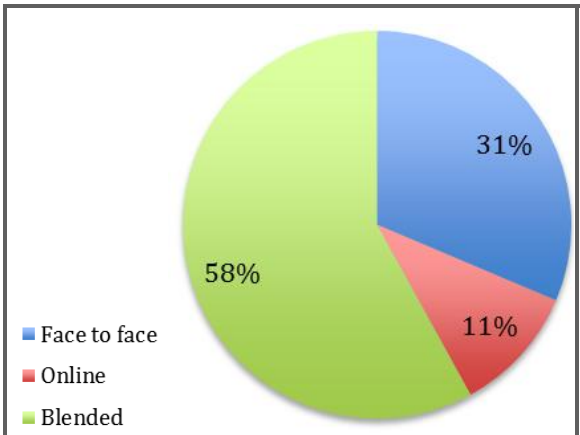


Chart 3. Training Format

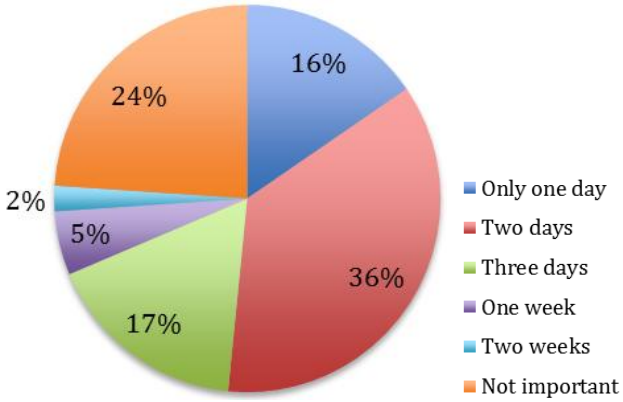


Chart 4. Preferred Length of Training

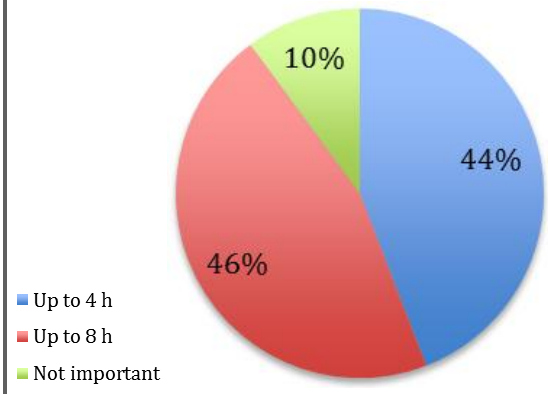


Chart 5. Length of Training (hours/day)

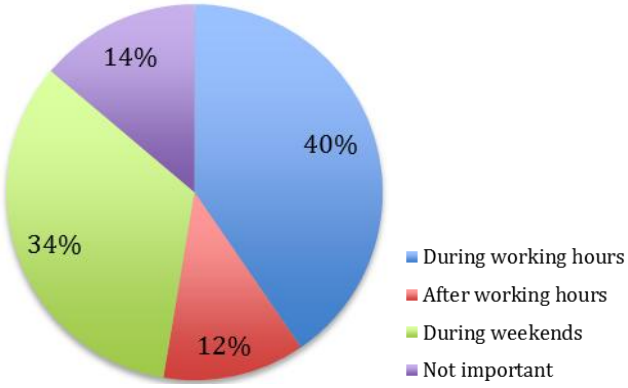


Chart 6. Training availability

Teachers were asked to select preferable length of training in hours during one day of a training course. A small majority (46%) selected up to 8h and 44% up to 4h. There are 10% of those who consider that length in hours is not important for their participation, Chart 5.

Chart 6 shows suitable training times for Teachers. They expressed moderate interest to participate in training during working hours (40%) while 34% of them would prefer to get trained during weekends. 14% find this as not important for their participation and 12% would prefer to get trained after working hours.

Recommendations

Consider designing training that lasts up to two days. There is no strong tendency to get training during working hours. If training is interesting, Teachers are willing to participate during weekends.

In the next round of Training Needs Assessment e.g. in the framework of NaRA, it would be worthwhile to rephrase this question and ask only about those interested in participating during working hours and after. Then, for those who selected after working hours an additional question will be asked: whether they prefer to get trained during the working week or during weekends.

Self-evaluation of work performance and attendance of trainings

Teachers were asked to self-evaluate their work performance. There are 61% satisfied and 25% to some extent satisfied with their work performance. There are 11% highly satisfied, 2% not much satisfied and 1% Not at all satisfied, Chart 7.

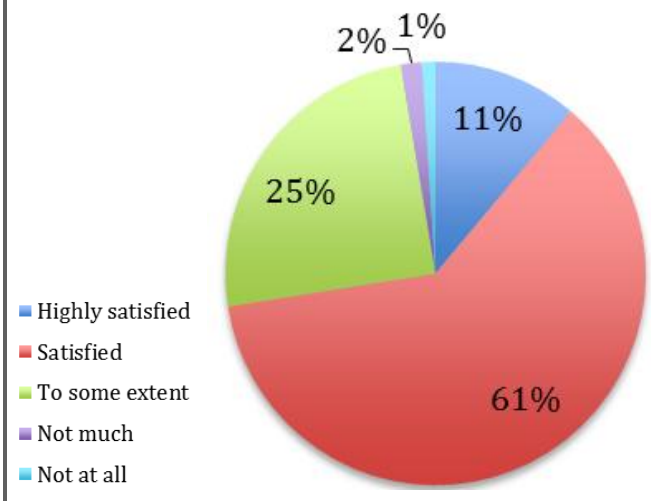


Chart 7. Self-evaluation of work performance

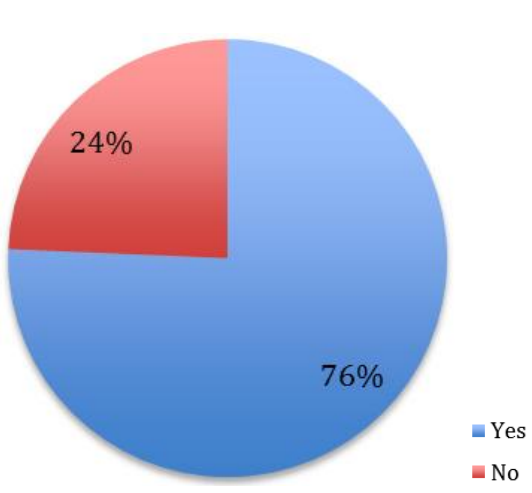


Chart 8. Participation in Trainings

Teachers were asked about their previous experience with continuing education training or in-service training courses in the last two years. The majority (76%) answered that they have attended such trainings and 24% have not, Chart 8.

They were also asked to write the name of the program that they consider of the highest value to their work. There were nearly 120 titles of seminars listed in the database.

Recommendations

In the next version of the Training Needs Assessment an additional question on reasons for not participating in in-service trainings could give more information on participation barriers and a question about other relevant training should be further specified/structured or defined in line of the needs of training providers.

Further analysis is needed to get better understanding on the results of self-evaluation of work performance as this is a multidimensional psychological response to what is involved in one's job. Some training may be designed and marketed in a manner that targets those teachers that are more or less satisfied with their work performance.

Training needs in soft skills, ICT and English language

In this section of the questionnaire, Teachers were asked to rate their knowledge and skills relevant for the current job with respect to different soft skills, ICT and knowledge of English language.

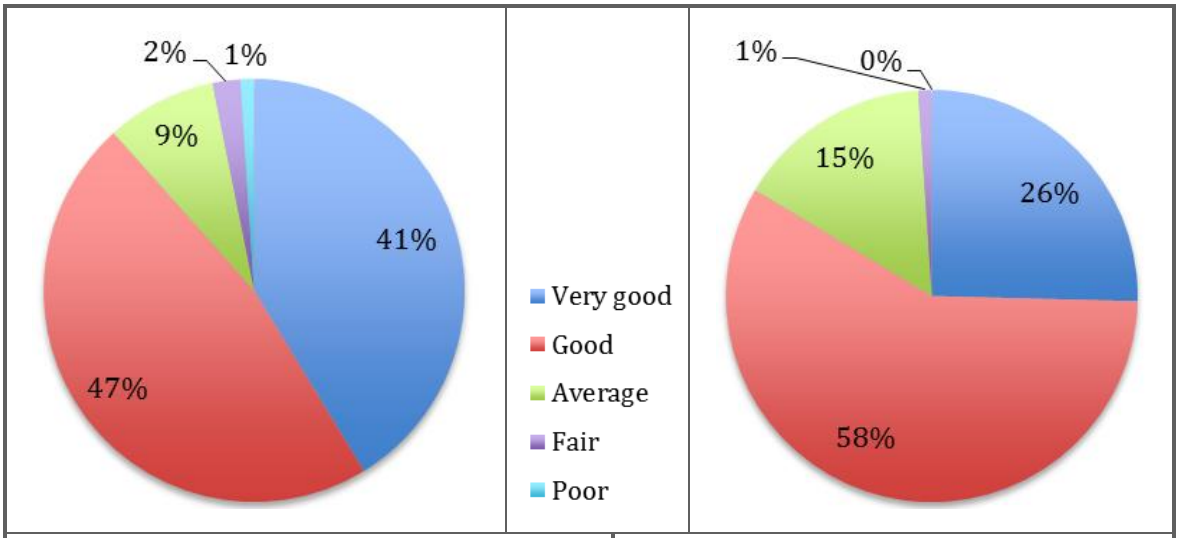


Chart 9. Teamwork Skills

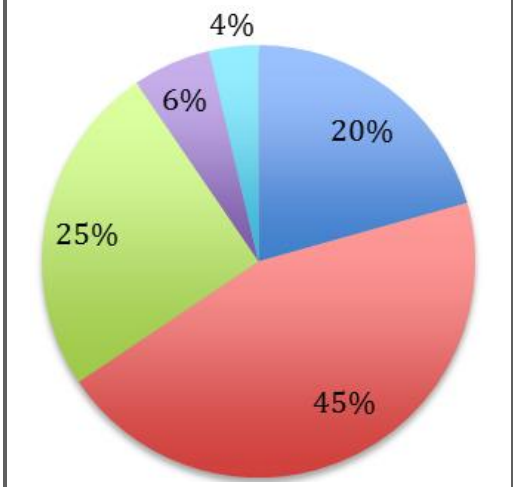
Chart 10. Presentation Skills

Teachers rated their Teamwork skills (ability to work effectively with others) as Good (47%), Very good (41%), Average (9%), Fair (2%) and Poor (1%), Chart 9.

Teachers rated their Presentation skills (effectively presenting your work results and ideas to a range of audiences) as Good (58%), Very good (26%), Average (15%) and Fair (1%). None of the respondents chose the option “Poor”, Chart 10.

Teachers rated their knowledge on ICT skills (being able to use computers to access, store, create and share information) as Good (45%), Average (25%), Very good (20%), Fair (6%) and Poor (4%), Chart 11.

Teachers rated their knowledge of the English language (speaking and reading English) as Poor (38%), Good (19%), Fair (18%), Average (17%), and Very good (10%), Chart 12.



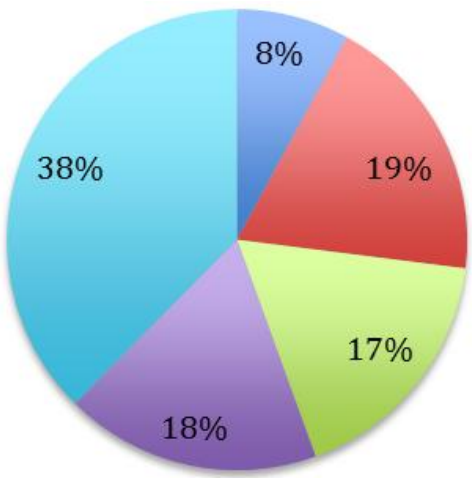


Chart 11. ICT Skills

Chart 12. English Language

Recommendations

In general Teachers rated the selected soft skills as good except in the case of their knowledge of English. There are several future scenarios that may be proposed and discussed:

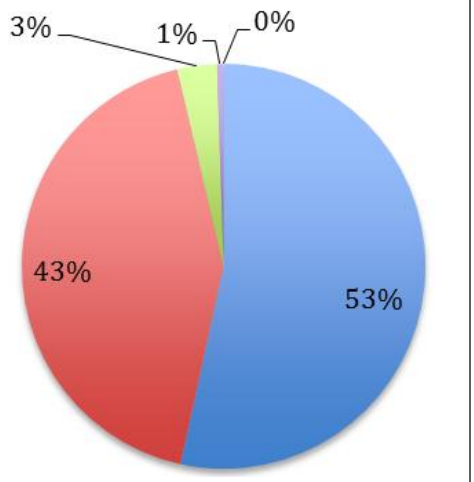
- Trainings on Presentation Skills and Teamwork skills can be combined with ICT skills, e.g. how to improve presentation skills while using presentation software and fostering teamwork skills by establishing online a teachers Community of Practices.
- Teachers' training needs could be subject to further research that would include interviews and/or testing or a new, more detailed questionnaire structured around case studies.
- Teachers could be offered short trainings with a focus on self-evaluation tools or testing that helps validating their knowledge and skills.

Teachers' skills and competences based on the Rulebook on Standards for the Teaching profession and professional development

Teachers were asked to rate their knowledge and skills relevant for their current job with respect to skills and competences needed for the Teaching Profession.

Teachers rated their Knowledge and skills on the subject matter (regarding their scientific discipline and sub-disciplines, its relevance to the wider social context, etc.) as Very good (53%), Good (43%), Average (3%), Fair (1%). None of the respondents chose the option "Poor", Chart 13.

Teachers rated their Knowledge and skills on curriculum planning, implementation and development (use of teaching methods and tools, assessment procedures, etc.) as Good (58%), Very good (27%), Average (14%) and Fair (1%). None of the respondents chose the option "Poor", Chart 14.



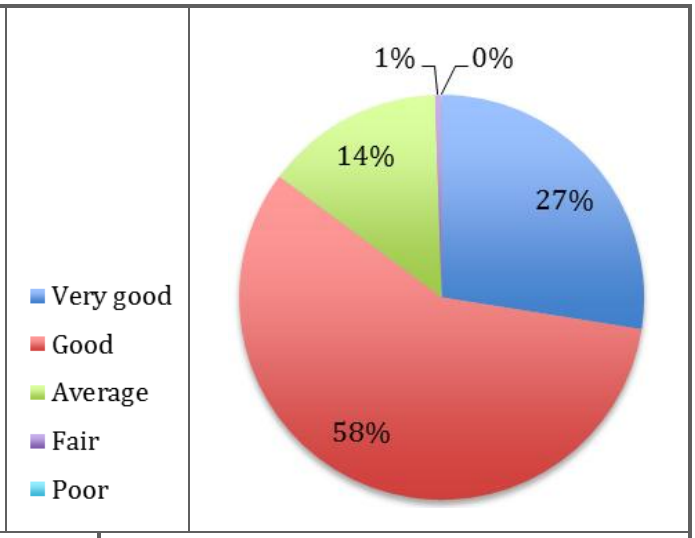


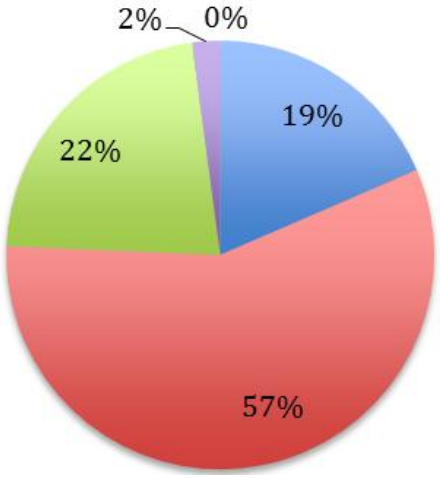
Chart 13. Subject Matter

Chart 14. Planning

Teachers rated their Knowledge on Teaching and Learning processes (theories of learning, cognitive development, learning styles, etc.) as Good (57%), Average (22%), Very good (19%) and Fair (2%). None of the respondents chose the option "Poor", Chart 15.

Teachers rated their Knowledge on Student Support (psychological, emotional characteristics of pupils, motivation tools, etc.) as Good (58%), Very good (24%), Average (14%) and Fair (4%). None of the respondents chose the option "Poor", Chart 16.

Teachers rated their knowledge on Communication and cooperation skills in an Education setting (cooperation with parents and colleagues, information sharing, etc.) as Good (54%), Very good (28%), Average (14%), Fair (3%). None of the respondents chose the option "Poor", Chart 17.



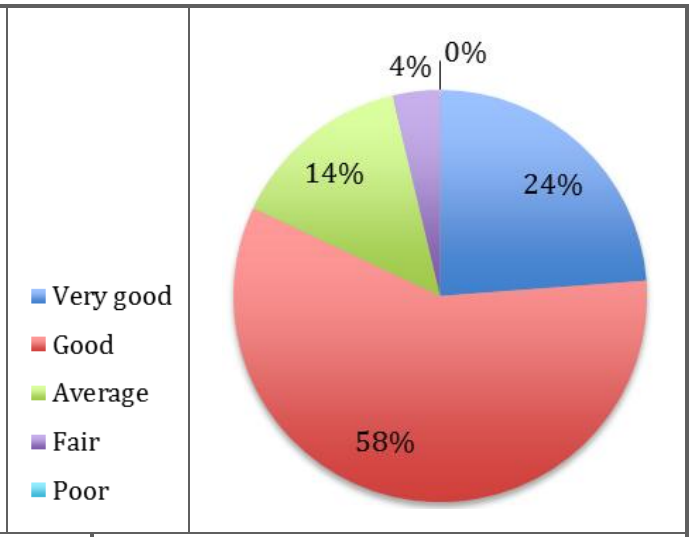
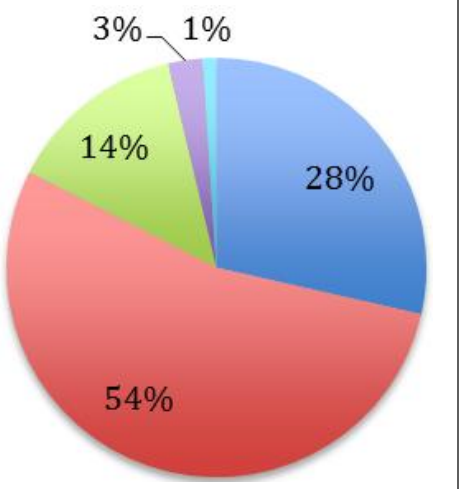


Chart 15. Teaching and Learning Processes

Chart 16. Knowledge on Student Support



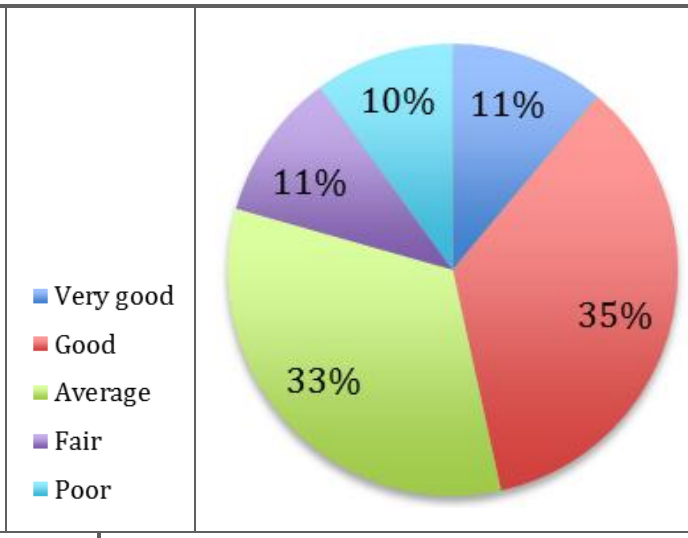


Chart 17. Communication and Cooperation Skills

Chart 18. Knowledge on the Accreditation Procedure

Teachers rated their Knowledge on the accreditation procedure of training courses (set of rules imposed by the Institute for Education Promotion, Centre for Teachers Professional Development) as Good (35%), Average (33%), Very good (11%), Fair (11%) and Poor (10%), Chart 18.

Interest for participation at trainings in subject areas

In the next section the Teachers were asked to select subareas within the given knowledge area where they would like to get training. The proposed structure of agricultural production systems differs than those for Advisors due to the nature of the teachers' work in Vocation Education Training sector.

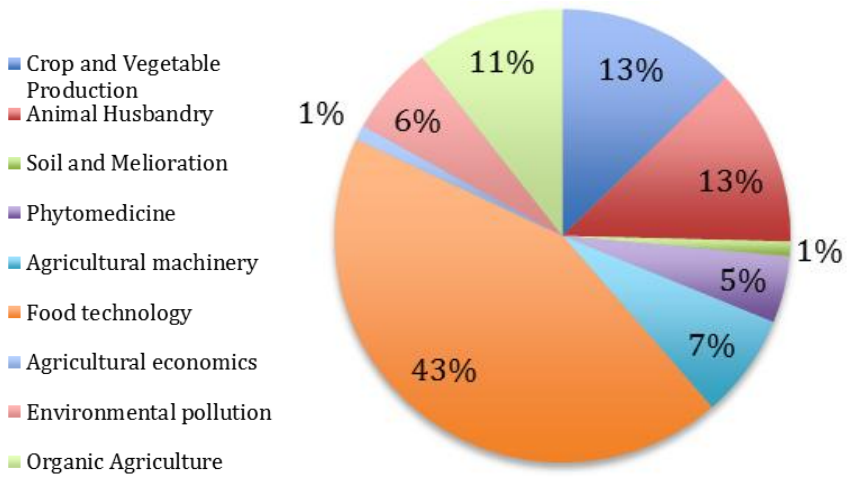


Chart 19. Areas

The Distribution of Teachers' interests is: Food technology (43%), Crop and Vegetable Production (13%), Animal Husbandry (13%), Organic Agriculture (11%), Agricultural machinery (7%), Environmental pollution (6%), Phytomedicine (5%), Agricultural economics (1%), Soil and Melioration (1%), Chart 19.

In the Tables below, there is an overview of the Teachers' interest in particular subject matters and their numbers in total. Teachers were also asked to propose other subareas (in case that subarea is missing) and to propose topics to be considered as training course subjects.

Teachers' interests in training in particular topics

Crop production	*Teachers*	*Crop production*	*Teachers*
Botany	0	Grape growing	6
Agro techniques	0	Aromatic plants	1
Agro ecology	0	Lawns	0
Crop farming	5	Plant nurseries	1
Vegeculture	3	Plant and Genetic Resources	0
Horticulture	3	Plant breeding	0
Fruit growing	2	Sowing	0
Production of seed and planting material	3	**Total interested teachers**	**24**
Other Crop production topics proposed by Teachers to be considered as training course topics: Intensive plant growing, Plant breeding and Genetics section, Seeds of old domestic vegetable varieties (fruit and grape).			

Animal Husbandry	*Teachers*	*Animal Husbandry*	*Teachers*
Agricultural Zoology	2	Forage crops and quality control	1
General Animal Husbandry	5	Breeding and reproduction of domestic and cultivated animals	8
The breeding of domestic animals	2	Aquaculture	0
The feeding of farmed and cultivated animals	3	Growing of small animals (worms, snails)	0
Milk production	0	Beekeeping	1
		Total interested teachers	**22**
Other Animal husbandry topics proposed by Teachers to be considered as training course topics: Hoof care - Animal hygiene and care, Milk production, Veterinary subjects, Cow Breeding for Organic Farming, Research and innovation in livestock, effective animal breeding and reproduction industry.			

Soil and Melioration	*Teachers*	*Soil and Melioration*	*Teachers*
Soil Science	1	Microbiology	0
Geology	0	Microorganisms and alternative agriculture	0
Agricultural Chemistry	0	Irrigation, drainage and soil conservation	1
Plant Physiology	0	**Total interested teachers**	**2**
There were no proposed topics to be considered as training course topics.			

Phytomedicine	*Teachers*	*Phytomedicine*	*Teachers*
Phytopathology	4	Pesticides	3
Entomology	2	Weed Control	0
		Total interested teachers	**9**
There were no proposed topics to be considered as training course topics.			

Agricultural machinery	*Teachers*	*Agricultural machinery*	*Teachers*
Mechanization in farming	7	Mechanization in grape growing	1
Mechanization in animal husbandry	3	Facilities/buildings used in agriculture	2
Mechanization in fruit growing	1	**Total interested teachers**	**14**
Other topics proposed to be considered as training course topics: The Use of Agricultural Residues and Energy Crops, Labor Saving Mechanization in Fruit, Seed drying equipment, Conservation tillage systems, combine harvesters (constructing, cost, etc.).			

Food technology	*Teachers*	*Food technology*	*Teachers*
Food preservation and fermentation and technology	23	Microbiology	8
Harvesting production and technology	9	Food safety and quality management	29
Animal production and technology	11	**Total interested teachers**	**80**
Other topics proposed to be considered as training course subjects: Conservation and Fermentation Technologies, Production of Cheese, Technological aspects of Microbiology, Food Safety and Quality Management, Baking Technology, Food technology – carbohydrates.			

Agricultural economics	*Teachers*	*Agricultural economics*	*Teachers*
Agricultural Economics and Markets	0	Contemporary issues in rural development	0
Agribusiness management	0	Agro tourism	0
Farm management	0	New concepts of cooperative	0
Entrepreneurship in agriculture	2	The concept of farm diversification	0
		Total interested teachers	**2**
There were no proposed topics to be considered as training course topics.			

Organic Agriculture	*Teachers*	*Organic Agriculture*	*Teachers*
Organic vegetable gardening	4	Organic livestock production	0
Organic farming	1	Fertilization in organic production	1
Organic fruit growing	3	Marketing of organic products	5
Organic grape growing	3	Laws and regulation in organic farming	3
		Total interested teachers	**20**
Some of the proposed topics to be considered as training course subjects: Organic food market, marketing and perspectives, Organic fruit, Organic farming uses fertilizers and pesticides, Organic processing.			

Control of environmental pollution in agriculture and food technology	*Teachers*	*Control of environmental pollution in agriculture and food technology*	*Teachers*
The control of environmental pollution in crop production	5	The control of environmental pollution in grape growing	1
The control of environmental pollution in horticulture	0	The control of environmental pollution in livestock production	1
The control of environmental pollution in fruit growing	1	The control of environmental pollution in aquaculture/aqua farming	1
		Total interested teachers	**9**
Some of the proposed topics to be considered as training course subjects: Air pollution control for the food industry.			

Other subareas	*Teachers*	*Other subareas*	*Teachers*
Coping with climate change and extreme events	2	Resource efficiency, low carbon and climate resilient agriculture	5
Women in rural development	8	Risk management in agriculture	6
GMOs, risks and benefits	68	Quality standards in agricultural production	15
Energy efficiency and small-scale production (bioenergy)	13	Sustainable use of pesticides	7
Enhancing farm viability and competitiveness	13	Environmental protection	27
Promoting food chain organization	12	Bioremediation of agricultural	4
Restoring, preserving and enhancing ecosystems	3	**Total interested teachers**	**183**
Some of the proposed topics to be considered as training course subjects: Future of Food, Environmental protection, Food chains, Agricultural subsidy for small farms, Agricultural Production and Profitability of Small Farms.			

Recommendations

Data presented in the report could be further compared with data on skills shortages in the agricultural sector, the EU common agricultural policy and national agricultural policy and other available research. In the next sequel of Training Needs Assessment it would be worth considering preparing this for only one area or subject.

External reviews of the TNA report from the EU partner institutions

External reviewers:
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As it is evident in this document there are two groups of interlinked people - advisors from Agricultural Extension Services and teachers from Agricultural Middle Schools who are according to their opinion more dominating in basic skills than specific – to EU common agriculture policy (CAP) oriented skills. Generally speaking, a high percentage is interested in EU legislation in agriculture and environment protection. However, this is in contradiction with outputs of the teachers, who are mostly oriented towards industrial agricultural technologies. It shows for example, dominant interest for new knowledge in the case of GMOs, classical knowledge of agricultural production topics, etc., but in the context of environment protection interest is small (1/3 vs. GMO) for organic farming, its benefits and market niches. This showed that **participants need to be more focused for example on specific knowledge for establishing better agriculture practices and environment protection supported by the EU Commission.**

In a new financial perspective up to 2020 the development of a Union agricultural sector is more territorially and environmentally balanced, climate-friendly and resilient and competitive and innovative. It contributes to the development of rural territories (EC rural development regulation 1305/2013). Organic agriculture contributes to achieving the following objectives:

a. fostering the competitiveness of agriculture;

b. ensuring the sustainable management of natural resources, and climate action;

c. achieving a balanced territorial development of rural economies and communities including the creation and maintenance of employment

For those, our suggestion is that the new knowledge needs to be more oriented to the concepts and tools of **sustainable agriculture management and services**, supported by the EU CAP, especially into:

1. Organic agriculture as the best practice for environmental protection (including water protection, biodiversity protection, agriculture on protected areas, etc.).
2. We are sure that organic agriculture is a mirror for the conventional sector for decreasing the effects on the environment and human health in choosing GMO-free crops, using integrated production systems with fewer synthetic chemicals and as a consequence fewer residues in the food, water and soils. Namely integrated plant protection is since 2013 obligatory for all producers in the EU; integrated plant production is a step further, but **organic farming is also a possibility to give added value to agricultural products on the domestic or export markets which are rising.**
3. Established crop rotations and agricultural services to prevent loss of biodiversity.

4. Including the knowledge from points 1-3) in economical terms, such as for special niche products with certified trade marks, including their producer organizations and infrastructure (half or full production chains), needs to be considered according to the EU policy and its support.
5. Multifunctional role of agriculture (production of food, energy and materials – providing incomes, working places and developing rural areas – environmental effect of agriculture preserving biodiversity, water, soils and air quality).
6. Short food supply chains supported in the EU could be a possibility also for a part of Serbian agriculture.

The Agriculture knowledge information system (AKIS) in the EU countries is also under changes as new needs are in front of farmers and advisors. According to the EU CAP, each country has to organise free access for farmers to get from state paid advisory services knowledge for all basic needs oriented towards good agriculture practice (GAP), integrated plant protection, good agriculture environment condition (GAEC), cross compliance (CC) and information about possibilities for farmers from pillar 1 and 2 from the CAP. On the other side, professional advising concerning production technologies for different branches, preparing business plans for investments could be organized differently.

But most important is to include different actors in the AKIS and in the framework of the CaSA project this could be partly achieved as three important actors are included (i) advisors, (ii) secondary teachers from agriculture schools and (iii) university teachers who are also researchers. Missing are only experts from NGOs dealing in the agriculture sectors (i.e. organic farming advice in several countries is based on professionals in different NGOs) and from producers organizations (cooperatives) and private advisors if they are operating in Serbia.

Also in the framework of the EU rural development legislation there is the possibility of encouraging collaboration among all actors (research - advisory – agriculture holdings, industry, ..) financing their activities in “operational groups” for solving specific problems or topics under European innovation partnerships (EIP), which is a common tool of the agriculture sector under the rural development programme and the research sector under Horizon 2020 where answering and researching real problems of the sector is the priority and also involving those who will use research results and new knowledge in practice. Collaboration in the CaSA project among three groups of actors is a good base, and only agricultural holdings have to be more involved in defining research questions and also in testing and searching for results.

In 2010, the Ministry of agriculture, food and forestry stated that Slovene rural development policy after 2013 should continue to be aimed at:

a. competitiveness of agriculture and related branches, particularly by boosting investment in new technologies, transferring research and innovation and increasing knowledge potential;
b. delivering agriculture-related public goods, especially maintaining agricultural activity in less favored areas (LFA), tending rural landscapes, preserving biodiversity, ensuring the good status of waters, drinking water sources, soil protection, ensuring animal welfare, adapting to climate change and maintaining the viability of rural areas;

c. enhancing the vitality of rural communities, in particular by enforcing the principles of sustainable local food supply and promoting diversification of economic activities (MAFF 2010).

The Slovene new Rural development program towards 2020 (RDP 2014-2020) which has been confirmed by the EU commission in February 2015 is oriented into those goals, but the position of farming smallholders is not good although in Slovenia small farms are the majority (the average farm is 6.8 ha). This topic should be addressed also from the point of view of developing agriculture in Serbia as it is very diverse in different regions of Serbia – from very big enterprises export-oriented which are also important employers to small farms based on family farming and producing agricultural products mainly for self-consumption.

Family farms are part of the solution for achieving food security and sustainable rural development; **the world's food security and environmental sustainability depend on the more than 500 million family farms that form the backbone of agriculture in most countries**. Family farms represent more than nine out of ten farms in the world and can serve as a catalyst for sustained rural development. They are the stewards of the world's agricultural resources and the source of more than 80% of the world's food supply, but many of them are poor and insecure in food production. Innovation in family farming is urgently needed to lift farmers out of poverty and help the world achieve food security and sustainable agriculture (SOFA 2014).

However, if smallholders were more organised (gathered in producer groups, organisations i.e. cooperatives or other legal entities based also on the principle of social entrepreneurship) they could also improve the economic situation in rural areas, which should be developed based on the needs of the rural population. This is also one of the measures which is developed in the EU where so-called "local action groups" (LAGs) are established to run community-led local development (CLLD) which should also be a topic for getting new knowledge for advisors in Serbia in the future.

See more in legislation and other sources:

EC Proposal for an Environment Action Programme to 2020 "Living well, within the limits of our planet" /* COM/2012/0710 final - 2012/0337 (COD). http://www.europarl.europa.eu/sides/getDoc.do?type= REPORT&reference=A7-2013-0166&language=EN

EC 1305 (2013). Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005. http://ec.europa.eu/digital-agenda/en/news/regulation-eu-no-13052013-european-parliament-and-council

EC 834 (2007). Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:189:0001:0023:EN:PDF

EU organic (2013). European Union Agriculture and rural development. Facts and figures on organic agriculture in the European Union. http://ec.europa.eu/agriculture/markets-and-prices/more-reports/pdf/organic-2013_en.pdf

IFOAM Highlights the Plight of Smallholder Farmers on Earth Day. IFOAM press release. http://www.ifoam.org/ sites/default/files/pr_earth_day_0.pdf

MAFF 2010. Slovenia's consideration on CAP after 2013. http://www.mkgp.gov.si/fileadmin/mkgp.gov.si/pageuploads/Aktualno/Slovenia_s_consideration_on_CAP_after_2013.pdf

RDP 2014-2020. Program razvoja podeželja RS za obdobje 2014-2020. podeželjahttp://www.program-podezelja.si/images/vsebine/PRP_2014-2020/priloge_tretji_uradni_predlog_22jan2015/PRP_tretji_uradni_predlog.pdf

SOFA (2014) The state of art of food and agriculture: Innovation in family farming. FAO http://www.fao.org/3/a-i4040e.pdf)

SURS (2012). The 2010 Agricultural Census - Every Farm Counts! Statistical Office of the Republic of Slovenia. http://www.stat.si/doc/pub/15-RP141-1202.pdf (Accessed 10.2.2015)

External reviewers:
Dr. Pasquale Pazienza, Dr. Nicola Faccilongo
University of Foggia, Italy

From the results of the questionnaires submitted to "Advisors" and "Teachers", we can observe how the training aspect was treated while distinguishing "general skills" from "more specific skills". It comes out evident how - if we consider the acquisition of general skills - the organization of training activities to improve ICT and English language skills is more required by "Advisors" rather than "Teachers". In fact, according to the analysis result, it looks like teachers are more grounded on these matters as one would normally expect.

With regard to this aspect associated to the acquisition of such a kind of "general skills", it appears relevant to meet the request with the aim of allowing those people working in sectorial consultancy to improve those skills. This would boost their capacity of "entering in touch" with self-study and scientific material produced at the international level which is normally disseminated in English and through ICT tools.

Moving on to focusing on the request of "more specific skills", the existence of a training demand is evident for improving knowledge of those aspects more specifically related to the practical techniques of agriculture and livestock. This is true for both the categories of respondents to the questionnaire. We do not want to enter the discussion on the choice of specific courses, as we believe this should be left to a free process directly driven by the interested parties - sectorial operators - in accordance to a bottom-up operational approach.

However, what we would like to recommend is that the content of the themes chosen as subjects of the training courses has to match the issues to which the European Union pays its major attention. In this sense, the main aspect is represented by the concept and tools for the sustainability of managing agricultural activities. This, in fact, represents one of the most important keywords of the European Union action. In addition, on the basis of the experiences observed for the case of the Puglia region (Italy), we think it appropriate that,

within the context of some subjects indicated in the results of the questionnaires, a **higher level of attention should be paid to the following issues** (in agreement with the policy indications deriving from the EU):

a. **water management** in agriculture (nowadays this is considered as one of the most relevant EU topics and must be viewed in both agronomic and economic terms);

b. **producers organization** (as a tool recognized in the EU legal framework whose aim is the aggregation of the agricultural supply);

c. **infrastructures and their support in rural areas** (to make networking among agricultural operators easier and to build a safer environment in rural areas. Both of these aspects are relevantly important to ensure production levels);

d. "**certification** of agro-food (latu sensu) and forestry product" should be perceived as one of the most relevant aspects. With respect to this, in fact, it must be highlighted how "certification" is one of the most important tools through which concepts such as innovation, safety, and market internationalization can be practiced and implemented.

External reviewer:
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Timisoara, Romania

After careful consideration of the findings of the Training Needs Analysis for both categories of potential trainees we can underline a number of observations and apparent links at the level of expectations.

The quantitative differences between the Advisors and the Teachers are not necessarily based on their professional development perspective but rather on the nature of their activity and “customers”. The expressed needs for further methodological development, acquisition and development of soft skills has a considerably larger specific weight because both categories rely critically on communication and the use of specific support to accomplish their jobs.

For generally motivated reasons, the expressed interest for specialized topics such as certain crop or animal production is high and in most situations this originates from the current opportunities, mostly market driven. Although these have high likelihood of building confidence and consolidating the professional relationship with customers on the long run, in the case of the extension/advisory personnel it is preferable to balance the specialized content as they are required to find and mobilize the expertise rather than acquire it by themselves. One common element of both advisory agents and teachers is represented by an important dimension of shaping the new knowledge. And we believe this can build as an important outcome of the trainings they undergo. Essentially, this consists of transferring the **capacity of screening innovations with the ability of making the appropriate choice for structure and content**. The central reason is that technical details continue to evolve on a daily basis and placing too much focus will ultimately result in the constant need to update and redesign the contents, while innovation continues to be extremely fashionable.

We find the results returned by the respondents comforting in terms of preparation efforts for the forthcoming trainings. If sufficient accent is given to the "enabling" part of the training, the ability to screen and optimize knowledge absorption should considerably improve as a result of these transfers.

An important number of current themes could be taken into consideration, at least as points of interest, among which we propose:

- **Community-lead Local Development** as the core process of future sustainable rural development, currently assessed as essential within the context of the Common Agricultural Policy framework and bridging to regional development, probably for the first time in the EU's public policy history;
- **Short food chains** as an extremely valuable option for small farmers as well as for the consumers and overall food safety of fresh products;
- The triangle **environment-agriculture-energy**, especially within the context of climate change;
- **Sustainable management of water and soil** resources in agriculture and forestry;

The above-mentioned themes are not meant to represent other than consideration within the overall content of the training as we believe it builds on the wider aspect of understanding developed for and with the trainees.

Internal reviews of the TNA report by CaSA Steering Committee

Although the TNA was carried out as planned and described in the CaSA project proposal, the focus was on a bottom-up approach of asking extension advisors and agricultural middle school teachers what their current levels of relevant skills are and what ***they*** want to learn. Thus, as might be expected from a bottom-up approach, respondents focused on their current personal interests and not on the strategic interests (or need) of Serbian agriculture in the mid- to long-term future. Serbian agriculture is in transition, not only in terms of essential structural reforms to adjust to the economic changes of the 1990s and 2000, but also to prepare itself for entry into the EU and the immense challenges that this will impose upon the quality and competitiveness of Serbian agricultural products.

Apart from this TNA there are other important information that training providers should carefully consult during course design. We would strongly advise constant updating on the on-going reform process. Particularly paying attention on a certain structural changes, e.g. already, import controls on certain agricultural products from the EU are being lifted and Serbian farmers are losing their share of these markets. Official publications from national and local bodies responsible for Agricultural Policy should be consulted as well.

Ministry of Agriculture, Forestry and Water Management (MAFWM) has Strategic Plans for developing agriculture and rural development (Strategy for Agriculture and rural development of the Republic of Serbia for the period 2014 – 2024 (Official Gazette RS 85/14 from 12. 8. 2014.)), and local authorities have also prepared Strategic Plans for agricultural (rural) development at the local level.

The Serbian MAFWM has had a succession of IPA-funded projects to provide technical support for harmonizing Serbian agricultural laws and regulations with EU regulations on agriculture, agricultural products, rural development and the environment. Thus it is essential that extension service personnel are equipped with the knowledge and skills to deliver this information to the farming and food production sectors. The CaSA project during its final year, and in future the NaRA, will interact with both the MAFWM and the National Employment Service to ensure that subsequent TNAs focus not only on the current interests of extension service personal and agricultural middle school teachers, but also on the needs perceived by MAFWM, local authority strategic plans for agriculture and rural development, and predictions of labour market demands.

These are likely to identify the development and supply of training courses in subjects not yet included amongst the current expertise of CaSA academic partners, such as tourism and other rural recreational activities.

A weakness in the current TNA questionnaire, commented on above, was the challenge experienced by respondents in providing genuinely objective assessments of many of their skills. For example, 90% of advisors assessed their communication skills to be either very good or good, yet feedback on the recently-held CaSA training courses for advisors to improve their communication skills were very well received and appreciated. Over 90% of advisors assessed their self-management skills to be either good or very good, yet time management of many students and graduates , having received no training in these soft skills during their higher education is often poor,

Thus, several of these generic skills of both agricultural advisors and agricultural middle school teachers, included in the TNA used here, should be assessed in the future using more targeted questioning with specific examples of soft skill applications.

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Building Capacity of Serbian Agricultural Education to link with Society, CaSA

Izgradnja kapaciteta srpskog obrazovanja u oblasti poljoprivrede radi povezivanja sa društvom