

# **The Norwegian Programme in Higher Education, Research and Development (HERD) in the Western Balkans, 2010-2014. HERD-Agriculture.**

## **Conference and project visits in Bosnia & Herzegovina, 30 September – 5 October 2013. An internal mid-term review.**

### **Introduction**

Norway's Ministry of Foreign Affairs entered into a 5-year agreement (2010-2014) with five institutions in Norway for the administration of the Programme in Higher Education, Research and Development (HERD.) The overall aim of HERD is to contribute to economic growth and social development through co-operation in higher education and research in the Western Balkans. HERD consists of five sector programmes, including HERD/Agriculture. HERD/ Agriculture wants to contribute to educating a national work force that has adequate innovative qualifications and to stimulate innovation, product and process development through support to applied research and development in the Western Balkans. *See <http://www.umb.no/noragric/article/higher-education-research-and-development-in-the-western-balkans> for details.*

Priorities for HERD/ Agriculture include:

**Institutional Development:** To contribute to educating a national work force that has adequate innovative qualifications by building, in the longer term perspective, sustainable capacity of higher education institutions in Bosnia & Herzegovina and Kosovo; and

**Applied Research and Development:** To stimulate innovation, product and process development through support to applied research and development in the Western Balkans.

HERD/ Agriculture's guidelines for project applications highlights:

- Improved conditions for agriculture and agri-business,
- Quality control of products after international standards,
- Creation of employment in agriculture.
- A regional approach in line with the Central European Free Trade Agreement (CEFTA) when appropriate,
- Projects should, when appropriate, be aligned with the EU support and EU requirements.

The second call under HERD/ Agriculture highlighted aquaculture and pastureland/ grazing, knowledge transfer from academic institutions towards farmers and farmers' organisations, economy and markets (value chains; "from farm to fork"), entrepreneurship and user aspects. HERD/ Agriculture is currently providing funding and support to 13 projects. See Appendix 1 for details. Plans for the implementation of the HERD programme called for mid-term reviews. This has been postponed for HERD/ Agriculture. The HERD/ Agriculture Board's visit to Bosnia 30 September – 5 October 2013 was therefore an internal mid-term review.

The Board had visited the region and met with project partners on two previous occasions, in 2011 and 2012. In addition, the project's annual reports for 2012 and the outcome of the annual seminars for project leaders, of which the last was held 11 September 2013, provided important background information prior to the Board's travel. The Board's travel and visit to Bosnia & Herzegovina 30 September – 5 October 2013 focused upon overarching challenges such as practical use of knowledge and knowledge transfer, institutional development, and sustainability related to agricultural activities. When possible, the Board wanted to see and discuss hands-on project activities via field visits.

Participants: HERD/Agriculture Board members Professor Sissel Rogne (Board chair and head of the delegation), Anne Kathrine Fossum, Lars Henrik Knutrud and Kari Redse Håskjold; Dr. Thor S. Larsen (Sector Manager and head of the secretariat) and Ms. Joanna Boddens-Hosang (Senior Advisor).

## **1. SUMMARY OF THE WEEK**

### **Monday 30 September**

Royal Norwegian Embassy, Sarajevo: Meeting with Ambassador Vibeke Lilloe and First Secretary Wenche Prebensen. Professor Sissel Rogne gave a briefing about the HERD/Agriculture delegation's travel and visit plans and the Embassy provided the delegation with valuable background information relevant for the Board's programme.

### **Tuesday 1 October**

Conference: Practical use of knowledge and knowledge transfer, institutional development and, sustainability related to agricultural activities. Hotel Radon Plaza, Sarajevo. 09:30 – 15:00. (*Programme is Annexed to this report. All project presentations and comments are described in the following section. All presentations can be found on the HERD/Agriculture website <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>*).

### **Wednesday 2 October**

Visit to University of Sarajevo/ Faculty of Agriculture and Food Science. Host: Prof. Dr. Hamid Čustović, Vice Dean for International Cooperation. Presentations were made by Dr Vesna Rakic, University of Belgrade/ Faculty of Agriculture (project "The use of natural zeolite (clinoptilolite) for the treatment of farm slurry and as a fertilizer carrier") and Dr. Sanja Orucevic, University of Sarajevo/ Faculty of Agriculture and Food Sciences, Food Technology Department (project "Antioxidant Activity and Stability of Bioactive Compounds during Processing of Ceratin Raw Materials of Plant Origin in Bosnia and Herzegovina"). Twenty staff and students participated. A guided tour of the laboratories was given.

Following the visit to the university, the delegation and project partners visited the laboratory and experimental field Butmir which is set up for the project "Agricultural adaptation to climate change - networking, education, research and extension in the West Balkans", and later visited a cow and sheep farm in Kakanj where the experiment for "Mineral improved food and feed crops for human and animal health" is set up and finally a field where the experiment for "The use of natural zeolite (clinoptilolite) for the treatment of farm slurry and as a fertilizer carrier" was set up.

### **Thursday 3 October**

Visit to University of Tuzla, Faculty of Technology. The delegation was received by Prof. Dr Amra Odobasic, Dean of Faculty. Host: Prof. Dr. Midhat Jasic. A meeting was held attended by project partners, students and representatives from industries, e.g. the meat industry and the pharmaceutical industry, total of 34 persons. Presentations were given by Prof. Dr. Midhat Jasic (project “Development of education and transfer of knowledge in the area of food technology – EDUFOOD”), Dr. Goran Vucic (project “Comparison of lamb carcass and meat quality of breeds in Western Balkan and Norway achieving improved palatability, sale and sustainability”) and Miljan Ebrez/ Biljana Rogic (project “Evaluation of cattle welfare and housing in Bosnia and Herzegovina and establishing a research/extension group in animal housing, welfare and behaviour”).

Following the visit to the university, the delegation was taken to a cattle farm outside of Tuzla, hosted by Vladimir Tomasevic, farm director. The farm (800 ha) had more than 600 cows for milk, meat and breeding purposes and 35 employees. The farm produced 40.000 litres of milk per day.

### **Friday 4 October**

Visit to University of Mostar, Faculty of Agriculture and Food Technology. Presentations were given by Ana Sabljo/ Faculty of Agriculture and Food Technology (project “Providing genetic diversity and healthy plants for the horticulture in Bosnia & Herzegovina”); Alisa Hadziabulic/Agromediterranean Faculty of the University DZemal Bijedic (gave supplementary presentation on the same project); Adrijana Filipović (project “Mineral improved food and feed crops for human health”); and Leona Puljić (project “Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing”).

After a brief visit of the laboratories for virus analysis, the group visited a large goat farm near Široki Brijeg, followed by a brief stop at a professor’s house to show the domestic use of fruit and wine, and a visit to the university research field in Rodoč.

After lunch, the Board travelled to Dubrovnik, Croatia, and the Secretariat went to Split. All returned to Norway on Saturday 5 October.

## **2. PROJECTS: PRESENTATIONS AND COMMENTS/OBSERVATIONS FROM THE BOARD**

Eleven of the thirteen projects supported by the HERD/Agriculture programme were presented during this visit.

Project: Mineral improved food and feed crops for human and animal health. Presented at the conference in Sarajevo, 1 October, by Dr. Mirha Djikic, University of Sarajevo, Faculty of Agricultural and Food Science; and at the University of Mostar by Adrijana Filipović, 4 October. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo> and <http://www.umb.no/noragric/article/herdagriculture-board-visit-of-universities-and-project-sites-october-2013>

The presentation pointed to the high level of cadmium and other heavy metals in the soil. Fertilizers are available to farmers; however, there is a lack of experience in the proper use of fertilizers and the use of fertilizers is not intensive. A manual will be prepared on fertilizer use for farmers (this will require funds).

In the Mostar area, it is typical for the soil to have a high pH level (although some areas this is lower). Analysis is being done whether there is cadmium in the soil – this is unknown so far. Farmers do not have the funds to carry out soil analysis, they would need to be subsidized. They generally use manure for fertilizing the fields.

- The Board stated that it is important that farmers develop fertilizing plans which address soil types and soil quality, including consideration of the use of manure. The negative consequences of heavy metals for human health are well known. But the indirect consequences, i.e. contamination via agricultural products, need to be studied more. Heavy metal contamination in agricultural production is probably related to soil quality and lack of fertilization will probably exacerbate the problem. Cadmium, which has negative effects upon agricultural production, may pose a problem in some areas and should be addressed in the future. Organic farming will not be recommended in areas with much heavy metals in the soil, e.g. on some former industrial land.

Project: Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing. Presented at the conference in Sarajevo, 1 October, by Prof. Dr. Slaven Prodanovic, Faculty of Agriculture, University of Belgrade, Serbia; and at the University of Mostar by Leona Puljić, 4 October. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo> and <http://www.umb.no/noragric/article/herdagriculture-board-visit-of-universities-and-project-sites-october-2013>

This project is challenging because it is large and broad with many components and partners. Three out of 12 MSc students have already graduated. There are three PhD students on the project and effective staff exchange, which has led to good research results. There was a discussion about how grasslands/ grazing land could be best managed for livestock production. Bosnia has a particular species of low quality grass. The Faculty of Agriculture at the University of Belgrade has an institutional gene bank, which consists of seeds (cereals) and vegetative material (fruits). The material is stored at 4°C and is regenerated in the fields. The total number of specimens within the gene bank is over 500 of which six were collected from the HERD project, from natural meadows and pastures on Western Balkans. The University of Mostar has also a gene bank. In Mostar, the presenter informed that the project uses the media and targeted advertising in a magazine read by farmers. Answering a question from the Board whether farms, in particular small farms, are able to adopt research outcomes on fertilizers she replied that farms often lack the machinery to work the fields. As an example, the application of results on corn which could be used in the manufacture of cattle feed (and later for human consumption) has not been demonstrated yet. Farmers need to be taught about the advantages.

- Project achievements have met the Board's expectations. The Board is impressed by good organisation and structure in the follow-up of a complex project. The project has developed good web-based solutions, but there is a need for linkages to other like-

mindful web solutions and an overview over curriculum development. The project has developed a BSc programme for ecological/ organic agricultural production. The Board welcomes the suggestion to link websites amongst the projects and to the HERD/Agriculture's website (this applies to all projects). Possibilities of applying organic farming are positive and should definitely be explored. The Board encouraged establishing gene banks.

Project: Agricultural adaptation to climate change - networking, education, research and extension in the West Balkans. Presented at the conference in Sarajevo, 1 October, by Professor Dr. Hamid Custovic, University of Sarajevo, Faculty of Agriculture and Food Science. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

There is a pragmatic attitude among farmers about climate change; the consequences of climate change are not of much concern in the daily running of the farm when other immediate problems are more challenging. The presenter noted that there are opportunities for increased food production in the Western Balkans and as well as opportunities for improvement and for export. The government policy on increasing food production is not consistent. Farmers have good access to water resources for irrigation. But appropriate farming expertise is often lacking and farm product quality and quantity is low, which leads to problems in the export of products. There is a need to introduce more effective farming, e.g. with the use of more fertilizers and by better organizations for farmers. There are also possibilities of increasing agri-technology and organic farming. There is an agency for labelling organic products in Bosnia & Herzegovina.

- The Board appreciates that the development of courses and education is well on its way, including education on organic production. There was good progress and many results in relatively short time.

Projects should make an effort to cooperate with each other where relevant, including joint courses/education activities. Professor Dr. Slaven Prodanovic (presenter of the previous project) confirmed that there is synergy between this and his projects and that the two universities should at least link websites. A suggestion from the audience about students using the same text books was noted.

Project: The use of natural zeolite (clinoptilolite) for the treatment of farm slurry and as a fertilizer carrier. Presented at the conference in Sarajevo, 1 October, by Dr. Vesna Rakic, Faculty of Agriculture, University of Belgrade. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

The field visit on 2 October demonstrated that the project focuses mainly on basic research. The project partners were trained in the use of GIS at UMB in 2004-2009, which has been beneficial. The fact that 6,000 ha of agricultural land have been abandoned over the last five years is a concern. There is a need for soil agronomy expertise.

- The Secretariat is requested to contact the project leader Tore Krogstad and obtain information about future plans and expectations.

- The Board finds that this project addresses practical challenges. Natural zeolite may increase and improve agricultural production, but much depend upon soil types, quality and soil Ph. The Board questions if the introduction of zeolites has any value for improvement of soil quality and for improved fertilisation. (Such questions were raised with the project leader professor Tore Krogstad when the Board had returned to Norway. He claims that natural zeolite binds nitrogen to manure and thereby contributes to more effective fertilisation. In order to be effective, natural zeolite must be spread on the fields before manure is applied. Professor Krogstad agrees, however, that it would be better if urea, manure and natural zeolite are mixed as slurry in containers before the mixture is spread on farmer fields. Poor economic conditions among farmers leads, however, to lack of investments in fertiliser storage facilities.)

Project: Development of education and transfer of knowledge in the area of food technology – EDUFOOD. Presented at the conference in Sarajevo, 1 October, by Professor Dr. Midhat Jasic, Tuzla University. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

The project cooperates with “Evaluation of fruit genetic resources in Bosnia-Herzegovina with the aim of sustainable, commercial utilization.”

- The Board considers that it is important that this project makes findings available at agricultural fairs and exhibitions. A center of knowledge transfer is different from traditional extension services and an interesting concept. There is a need to know more about this. There is also a need to follow up on cooperation with industries.

Project: Evaluation of fruit genetic resources in Bosnia & Herzegovina with the aim of sustainable, commercial utilization. Presented at the conference in Sarajevo, 1 October, by Dr. Fuad Gasi, Faculty of Agriculture and Food Sciences, University of Sarajevo. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

The presenter noted that a report is being made on the sustainable utilization of fruit resources commissioned by the Federal Ministry.

The visit to the laboratory in the University of Sarajevo (2 October) was very encouraging. Many dedicated students are working there, roughly 50-50 men/ women. They were interested in the conservation and use of traditional varieties of fruit and berries, e.g. a Norwegian pear variety “Ingeborg” had been “saved” by this project.

- The Board finds that this project’s progress is excellent; fruits of the best quality are being produced. This project could take a leading role in setting up a genetic resource centre, together with other relevant projects such as “Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing”. The technological approaches and solutions are very good and impressive (“world class”). The project is in the forefront with regard to genetic technology, which can be of benefit to many countries, including Norway. This project is also active at local farmers’ markets where they provide professional advice to farmers and other users and also encourage them to try out seeds or seedlings of plant

varieties. Important knowledge has been transferred to Norwegian partners, which is considered very good. Research under this project can be of importance for quality controls and for utilization of genetic resources and the development of a programme for conservation of genetic resources is a challenge. (A request about this from federal authorities can be important and may also be relevant for other projects under HERD/ Agriculture, e.g. the projects “Manufacture of Traditional B&H Cheeses with Selected Indigenous Bacterial Cultures and Technological Parameters as Basis For Industrial Production” and “Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing”).

Project: Manufacture of Traditional B&H Cheeses with Selected Indigenous Bacterial Cultures and Technological Parameters as Basis for Industrial Production. Presented at the conference in Sarajevo, 1 October, by Professor Dr. Zlatan Sarić, Faculty of Agriculture and Food Sciences Food Technology Department Laboratory of Dairy Science, Sarajevo. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

Regarding the variable quality of cheese from cow and sheep, and payment according to quality, the presenter remarked that ewe milk poses a greater challenge with regard to hygiene than cow milk. 97% of all milk produced in Bosnia & Herzegovina is for domestic use and production, whilst 80% of meat which is consumed comes from import. It is important that raw milk for cheese production satisfy quality and hygienic requirements. Large scale cheese producers must have a certain quality of the milk used for their production, but most often farmers are unable to meet such requirements because of quality control costs. This creates a vicious circle: Although milk production in Bosnia & Herzegovina is sufficient to meet demands for cheese production, the low quality means that farmers are unable to sell, which leads to reduced income. They are thus unable to pay for milk quality controls which again lead to less domestic milk supplies for cheese production. Low scale milk production may have important multiplier effects because small farms are labour intensive and can employ several family members and others. However, small farms may not give sufficient income to sustain a family.

- The Board finds this an exciting project which is well under way. The project has so far been unable to isolate pathogens and hygiene is a major challenge. There are opportunities for cooperation with the project “Study of the microbiological flora of milk and dairy products in Kosovo: with emphasis on pathogenic bacteria and lactic acid bacteria.” The matter of poor hygiene is clearly a problem (ewe milk quality being worse compared to cow milk). The project is making progress but has not used pathogens so far (of the two projects, one has a focus on pathogens and the other on starter cultures).

Project: Comparison of lamb carcass and meat quality of breeds in Western Balkan and Norway achieving improved palatability, sale and sustainability. Presented at the conference in Sarajevo, 1 October, by Goran Vucic, Sci.ass/ PhD, Technological Faculty Banja Luka. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

Regarding possibilities for exporting lamb products, the presenter said that the taste and level of salt in the meat products will be compared to that in other countries before export can be considered. The quality of wool is relatively poor. Wool for clothing is mostly imported. There is no breeding programme for Kemenko sheep or classification system. Adherence to the European system of classification would result in more income for the farmers.

- The Board's consideration is that this project is working with lamb products which are very special for the region, but probably not in much demand in other countries. It seems that bad hygiene during production is masked with salt and smoking. It was recommended that this project should plan for a continuation after funding from the HERD-programme has stopped, e.g. to pursue Norwegian partnership with a breeding programme.

Project: Antioxidant Activity and Stability of Bioactive Compounds during Processing of Ceratin Raw Materials of Plant Origin in Bosnia and Herzegovina. Presented at the University of Sarajevo, 2 October, by Dr. Sanja Orucevic, University of Sarajevo/ Faculty of Agriculture and Food Sciences, Food Technology Department. See link to presentation on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

- The Board expressed its satisfaction with project progress and achievements. Collaboration with other projects is recommended (e.g. "Manufacture of Traditional B&H Cheeses with Selected Indigenous Bacterial Cultures and Technological Parameters as Basis for Industrial Production" ) and sharing technical equipment. The project should explore opportunities for support for women e.g. for collecting and processing of wild berries, herbs and fruits. (The Norwegian Embassy's "small funds" could possibly support such activities; there may also be some modest funding available for gender/women aspects from the Norwegian Embassy, in particular for activities which prioritise women from poor areas).

Project: Evaluation of cattle welfare and housing in Bosnia and Herzegovina and establishing a research/extension group in animal housing, welfare and behaviour. Presented at the University of Tuzla, 3 October, by Miljan Ebrez, University of Banja Luka, Faculty of Agriculture. See link to presentation on <http://www.umb.no/noragric/article/herdagriculture-board-visit-of-universities-and-project-sites-october-2013>

This project has just started (2013) and was therefore not yet in a position to present concrete results and achievements.

Following the presentation on this project at the University of Tuzla, the HERD/ Agriculture Board member Kari Redse Håskjold gave a presentation about Nortura, a Norwegian

agricultural cooperative. Ms. Håskjold is not only Nortura's Vice President, but also a farmer. She argued that Nortura could serve as a model for farmers in the Western Balkans to be better organised in order to provide mutual advice and support and to be more recognised by the authorities.

The audience responded that farmers were better organised before the war in the region, but that the government was less supportive towards farmers today. It is difficult to invest in farming because the future is unpredictable and prices fluctuate, but also because farmers face tough competition from imports, e.g. from Serbia. A quota system for import of meat was recently dismissed by the government. Tariffs were abolished unilaterally without consulting farmers or the industry. Moreover, there is also less demand for some farm products, e.g. sheep meat (sheep are not processed in the Tuzla region). People eat fresh sheep meat but not other sheep products. Some eat cured meat. Poultry is in a better situation: raising chickens costs less than cattle, and producers export to Serbia.

- Ms. Håskjold encouraged domestically produced food, not imported. She recommended establishing a stronger system in Bosnia & Herzegovina which will benefit the country in the long run. A database on dairy cows, such as in Norway, is lacking in Bosnia & Herzegovina.
- Board member Lars Henrik Knutrud pointed to the Central European Free Trade Association (CEFTA), which is the framework agreed by member countries in the Balkans for regulating trade between each other. It is within this arrangement that tariffs should be negotiated. He recommended that the farmers as well as the industry approached the Government in order to clarify the withdrawals of tariffs.

The farm visit on 3 October (Tuzla) gave the delegation a demonstration of equipment used for controlling animal housing quality parameters such as temperature, different air components, light etc. Plans are to develop standards for animal housing in Republika Srpska. The project has developed registration forms to be used on 80 selected farms, of which 95% had unacceptable animal housing conditions. In this context it must, however, be considered that livestock on small farms spend most of their time in the fields and low housing quality is of less concern.

Project: Providing genetic diversity and healthy plants for the horticulture in Bosnia & Herzegovina. Presented at the University of Mostar, 4 October, by Ana Sabljo/ Faculty of Agriculture and Food Technology and supplementary presentation by Alisa Hadziabulic/Agromediterranean Faculty of the University DZemal Bijedic. See link to presentations on <http://www.umb.no/noragric/article/herdagriculture-board-visit-of-universities-and-project-sites-october-2013>

Food fairs are used in the Mostar region, particularly for produce such as figs, pomegranates and wine. PhD students doing research on virus analysis of vine cultivars work together with wine producers. There are approx. 30 vineyards in the region. Wine is exported to Germany and other countries where Bosnians live, and also to China and Japan. There is a web-based catalogue on Bosnian wines and there are plans to produce a printed catalogue for local farmers which will enhance their need for knowledge-sharing. Strawberry plants are imported from Italy but are infected with a virus (research is being done on this). Domestic strawberries

are more expensive than imported strawberries. The import lobby is strong and is supported by the government, and phytosanitary rules are not being implemented. There is also a general attitude that foreign/imported items are better than domestic products. Communication between the different government levels is also unclear: the federal level deals with international rules, whilst cantons make their own decisions.

- The Board questioned the lack of import restrictions and phytosanitary rules which allow the import of the virus-carrying strawberries from Italy. It added that national production should be promoted and that import also has negative effects on e.g. climate. Many countries now promote the use of domestically grown products. A strong lobby by e.g. farmer organizations could change this. The Board added that universities also carry the responsibility of informing the public about the positive aspects of domestic products vs negative aspects of imported items. The media should be used and domestically produced strawberries should be labelled as virus-free.

The project “Study of the microbiological flora of milk and dairy products in Kosovo: with emphasis on pathogenic bacteria and lactic acid bacteria. Microbial quality of milk in Kosovo - a challenge” was not presented during this visit due to the inability of the project coordinator Ibrahim Mehmeti, Research Fellow, University of Prishtina, to obtain visa for Bosnia & Herzegovina.

The project “Grassland management for high forage yield and quality in the Western Balkans” has partners in Banja Luka, Prishtina and Novi Sad, but were unable to meet with the Board.

### **3. OBSERVATIONS AND SUMMARY**

The Board had many opportunities to see and discuss hands-on project activities during the visits. The general perception is that the HERD/ Agriculture projects are progressing well according to plans, with many achievements. There is indeed a focus upon practical use of knowledge and knowledge transfer, institutional development and sustainability related to agricultural activities.

- Setting up knowledge centres (vs extension services): should be explored further. Ways to improve collaboration with industry should be addressed (see EDUFOOD project).
- A government policy for agricultural quality controls or certification system is lacking. Product quality controls and health certificates are prerequisites for EU-export. Farmers are often forced to sell their products at low prices on domestic markets, which often lead to poor hygienic standards. University staff are sometimes invited to local fairs and exhibitions to evaluate products and give prizes for food product quality and/or carry out chemical analyses.
- Legislation, regulations, management roles and responsibilities often differ between cantons and federal government institutions, which pose a challenge to further agricultural development.

- Young people's opportunities for employment and careers in agricultural production and related industries: MSc and PhD candidates who were trained abroad found few job opportunities when returning to their home countries. Students lack the possibilities for getting practical work experience. The industry does not prioritize employment of candidates which hold a high academic degree (MSc or PhD.) Ways and means to improve collaboration between agricultural faculties and relevant industries should be explored. (A suggestion was made at the 1 October conference to establish an internet- forum which would facilitate access to job opportunities in the industry. Alumni have established a Facebook group to share experiences but a formal group was seen to be beneficial).
- Implementing the Bologna process: some universities maintained their traditional education and training without recognition of the Bologna-process. Lack of professional staff who may provide adequate education is a common constraint. Closer cooperation between universities and transboundary visits with the objective to improve and harmonise education was recommended. Better access to internet based libraries would be very helpful.
- Genetic resources in Bosnia & Herzegovina: Bosnia & Herzegovina has more than 10 years' experience and there is a genetic research network with its own web-site. The University of Sarajevo has a gene bank funded by Sweden/ SIDA. There is also a regional network for plant genetic resources with a website. All in all, some of the region's best work on genetic resources is currently done in Bosnia & Herzegovina. Establishing a genetic resource centre should be explored.
- Intellectual property rights: Although Bosnia & Herzegovina is signatory to the Convention on Biological Diversity (which recognises countries' genetic property rights) it lacks a good system for protection of property rights and is hence vulnerable to exploitation from outsiders.

In Tuzla (3 October), Ms. Emilija Spasesaka Aleksovska, Zada Pharmaceutical Tuzla, informed about the importance of herbs for medicinal purposes (folk tradition in Bosnia) and commented that domestically produced food items would be cheaper and faster to obtain but currently the domestic market is small. The industries want to cooperate with the University of Tuzla, which opens up for employment opportunities for students after graduation. Ms. Aleksovska added that her company collaborates with the faculty and currently has 10 PhD students and several Master students involved. Regarding legal aspects associated with harvesting of wild natural resources, patenting and patent rights on products emerging from such resources and customs regulations for agricultural products: small companies extract wild berries which are sold to foreign companies at a low price. The berries are processed and sold at a higher price. In principle wild berries can be picked by the public (except cultivated berries on private land). The Board questioned whether the rural people are aware of this, pointing to the issue of ownership of land.

- Possibilities of applying organic farming are positive and should be further explored.

- Strengthening of cooperatives for support to small scale farmers, e.g. after the Nortura-model should be considered. Possible cooperation with e.g. the Norwegian farmers association (Bondelaget) and The Royal Norwegian Society for Development (Norges Vel) should be explored.
- It is recommended that the Bosnia & Herzegovina government make active use of the CEFTA agreement to enhance competitiveness of its agriculture and food industry. Liberalization of trade in agricultural goods should be dealt with in a reciprocal way within this organization.
- Funding after 2014: The Board strongly recommended that HERD/Agriculture projects should search funds and/or new research collaboration partners soon. There could also be opportunities for some modest funding for gender/women aspects in projects from the Norwegian Embassy, in particular for activities which prioritise women from poor areas.
- Generally, satisfaction and thanks for effective project organisation and funding to the HERD/Agriculture programme was expressed at all venues. A request was made for material sent from Norway to Bosnia be labeled as “Donation from Norway” in order to avoid paying import duties.

Additional comments at the 1 October conference from Amir Lubovac, expert advisor to the Ministry of Foreign Trade and Economic Relations, Department for Agriculture, Food, Forestry and Rural Development: Bosnia & Herzegovina has signed the CEFTA agreement two years ago which opens opportunities for new markets outside the country. He encouraged Norwegian markets to invite Bosnia & Herzegovina producers noting that there are good opportunities for collaboration with investors and businessmen. An international donor conference was scheduled for the fall of 2013 and the Norwegian Embassy would be invited to participate.

## **APPENDIX I. TRAVEL ITINERARY (*daily changes in programme 2-4 October not included*)**

### **The Norwegian Programme in Higher Education, Research and Development in the Western Balkans, 2010-2014. HERD-Agriculture: Visit and conference in Bosnia & Herzegovina, 30 September – 5 October 2013**

#### **Sunday 29 September**

Secretariat + Lars Henrik Knutrud travel to Sarajevo. Stay at Hotel Radon Plaza (10 min. from town centre) <http://www.radonplazahotel.ba/en/> Address: Džemala Bijedića 185, Sarajevo 71 000, telephones: +387 (0)33 752 900 / (0)33 752 987

#### **Monday 30 September**

A.m.: Secretariat verify logistics and conference requirements/set-up at Hotel Radon Plaza and other details for rest of week.

P.m.: 3 board members arrive. 15:30: confirmed visit with the Norwegian Embassy. Dinner in town with key people from embassy. Overnight stay at Hotel Radon Plaza.

#### **Tuesday 1 October**

09:30 – 16:00: HERD/ Agriculture conference at Hotel Radon Plaza.

Programme is attached.

Overnight stay at Hotel Radon Plaza.

#### **Wednesday 2 October**

09:00 – 15:00: Whole day: Board + secretariat (+project coordinators a.o.) visit University of Sarajevo and partners. Purpose: See hands-on project activities (“field visit”). Contact: Hamid Čustović (Faculty of Agriculture and Food Science Sarajevo, telephone +387 61 775 211, email: [custovic.hamid@gmail.com](mailto:custovic.hamid@gmail.com), Gaši Fuad (Faculty of Agriculture and Food Science Sarajevo, telephone +387 61 348 106, email: [fudo01@yahoo.com](mailto:fudo01@yahoo.com)

- 09:00-10:15: A short welcome at the University, project presentation and discussion. Presentation held by: Vesna Rakić (Faculty of Agriculture University of Belgrad, email: [vesna.rakic@agrif.bg.ac.rs](mailto:vesna.rakic@agrif.bg.ac.rs), Zlatan Sarić (Faculty of Agriculture and Food Sciences Food Technology Department Laboratory of Dairy Science, phone number +38761252867, email: [sariczlatan@gmail.com](mailto:sariczlatan@gmail.com), Fuad Gasi (Faculty of Agriculture and Food Sciences, University of Sarajevo. Phone no: +38 76 134 8106. Email: [fudo01@yahoo.com](mailto:fudo01@yahoo.com), Sanja Orucevic (Faculty of Agriculture and Food Sciences, University of Sarajevo, Email: [orucevicsanja@yahoo.com](mailto:orucevicsanja@yahoo.com), phone no:+387 62 146 502), Hamid Čustović (Faculty of Agriculture and Food Science Sarajevo, phone no: +387 61 775 211, email: [custovic.hamid@gmail.com](mailto:custovic.hamid@gmail.com)
- 10:15-10:35 Coffee break
- 10:35-10:50: ”Manufacture of Traditional B&H Cheeses with Selected Indigenous Bacterial Cultures and Technological Parameters as Basis For Industrial Production.” Visiting the laboratory at the faculty, contact dr. Zlatan Sarić, Faculty of Agriculture and Food Sciences Food Technology Department Laboratory of Dairy Science, phone number 0038761252867, email: [sariczlatan@gmail.com](mailto:sariczlatan@gmail.com).
- 10:50-11:05: “Agricultural adaptation to climate change - networking, education, research and extension in the West Balkans.”, Visiting the laboratory at the faculty, Contact: Hamid Čustović (Faculty of Agriculture and Food Science Sarajevo, telephone +387 61 775 211, email: [custovic.hamid@gmail.com](mailto:custovic.hamid@gmail.com) ,

- 11:05-11:20: “Evaluation of fruit genetic resources in Bosnia-Herzegovina with the aim of sustainable, commercial utilization.”, Visiting laboratory at the faculty (Contact: Fuad Gasi, Faculty of Agriculture and Food Sciences, University of Sarajevo. Phone no: +38 761348106. Email: [fudo01@yahoo.com](mailto:fudo01@yahoo.com),
- 11:20-12:30: “Evaluation of fruit genetic resources in Bosnia-Herzegovina with the aim of sustainable, commercial utilization.”, Visiting laboratory at the experimental field Butmir (Contact: Fuad Gasi, Faculty of Agriculture and Food Sciences, University of Sarajevo. Phone no: +38 761348106. Email: [fudo01@yahoo.com](mailto:fudo01@yahoo.com), “Agricultural adaptation to climate change - networking, education, research and extension in the West Balkans.”, Visiting the experimental field Butmir, Contact: Hamid Čustović (Faculty of Agriculture and Food Science Sarajevo, email: [custovic.hamid@gmail.com](mailto:custovic.hamid@gmail.com), telephone +387 61 775 211,
- 12:30-13:30: Lunch at restaurant Rimski most, Blažujski drum bb Sarajevo, [www.hotel-rimskimost.com](http://www.hotel-rimskimost.com). Lunch with HEARD representatives and representatives from Faculty of Agriculture and Food Science University of Sarajevo: Mirsad Kurtović, Hamid Čustović, Fuad Gaši, Zlatan Sarić, Sanja Oručević, Senija Alibegović-Grbić, Mirha Đikić)
- 13:30-14:30: Going to cow and sheep farm in Kakanj where the experiment for the HERD Project: “Mineral improved food and feed crops for human and animal health.” was set up. Contact: Mirha Đikić, (Faculty of Agriculture and Food Sciences, University of Sarajevo. Phone no: +38 761 543 652. Email: [m.dikic@ppf.unsa.ba](mailto:m.dikic@ppf.unsa.ba).
- 14:30-15:00: Visiting farmer's field where the experiment for the HERD project “The use of natural zeolite (clinoptilolite) for the treatment of farm slurry and as a fertilizer carrier” was set up. Contact: Senija Alibegović-Grbić, (Faculty of Agriculture and Food Sciences, University of Sarajevo. Phone no: +38 761 701 760. Email: [s.alibegovic-grbic@ppf.unsa.ba](mailto:s.alibegovic-grbic@ppf.unsa.ba).
- 15:00-17:30: Drive to Tuzla (122 km; 2 hrs). Overnight stay at Hotel Tuzla.

### **Thursday 3 October**

09:00 – 15:00: Board + secretariat (+project coordinators a.o.) Visit University of Tuzla and partners. Purpose: See hands-on project activities (“field visit”).

Invited persons:

#### Professors, students and university staff

1. Doc Dr Sc Ramzija Cvrka
2. Doc Dr Sc Zahida Ademovic
3. Prof Dr Sc Husejn Keran
4. Prof Dr Sc Snjezana Maric
5. Prof dr Fuad Gaši Sarajevo
6. Dr Sc Besim Salkic
7. Hava Mahmutovic dipl.ing

#### Students

8. Mahovac Edin
9. Bašić Azem
10. Azra Beganovic

#### EDUFOOD Project participants

1. Representative Ministry of Agriculture and food industry of canton Tuzla
2. Institute of Agriculture Director Fadil Mehmedovic dipl.ing
3. NERDA representatives Slavis Stajkovic dip.ecc
4. Representative Fana Srebrenik, Alen Dzafic dipl.ecc
5. Representative Memprom Tuzla

6. Jasna Mehic dipl ing Representative Vegafruit Gradačac
7. Almir Pirić dipl ing Representative Bony Tuzla
8. Representative of Eko Herb Srebrenik, Bjelić Hasib
9. Representative of Zada pharmaceutical Tuzl Emilija Spasesaka Aleksovska mr ph
10. Asociation of agriculture of Chambar of comerce, Suad Selimovic dipl ing
11. Vladimir Tomasevic, dip ling farm director

Project coordinators, EDUFOOD project participants, professors and students, members of EDUFOOD Alumni, Nerda –regional development agency and representative from Ministry of Agriculture. FromNorway: Members of HERD Board , secretariat and project coordinators.

- 09:00- 09:30: Dean of faculty visit. Tuzla University (UNTZ), Faculty of Technology, Univerzitetska 8, 75 000 Tuzla. Contact: Prof dr Amra Odobasic , Dean of Faculty.
- 09:30-10:00: Short press conference about EDUFOOD activities project. Prof dr Amra Odobasic, Dean of Faculty, Prof. Dr. Midhat Jasic and guests from Norway will participate.
- 10:00-10:05: Opening the meeting program. Prof. Dr. Amra Odobasic, Dean of Faculty, Prof. Dr Midhat Jasic and guests from Norway. Speech and discussions.
- 10: 05-10:20: “Development of education and transfer of knowledge in the area of food technology – EDUFOOD.” (HiST/Nils Juul). Contact: Prof. Dr. Midhat Jasic.
- 10:20-10:35: “Comparison of lamb carcass and meat quality of breeds in Western Balkan and Norway achieving improved palatability, sale and sustainability.” (UMB/Björg Egelandstal and Dr. Milena Bjelanovic) Contact: Goran Vucic
- 10:35- 10:45: “Evaluation of cattle welfare and housing in Bosnia and Herzegovina and establishing a research/extension group in animal housing, welfare and behaviour.” (HiHM/ Lars Erik Ruud and Fred H. Johnsen.) Contacts: Miljan Ebrez and Biljana Rogic.
- 10:45-11:00 Discussion
- 11:00-11:30: Visit to labs of food technology and show equipment. Prof dr Husejin Keran
- 11:30 -12:15: Transportation. Prof dr Midhat Jasic
- 12:15 -13:30: Farm visit Local Projects partners. Vladimir Tomasevic, farm director, telephone 062 330 702
- 14: 00-15:00: Lunch. Prof dr Midhat Jasic
- 15:00-19:00 Travel from Tuzla to Mostar (237 km; 3,5-4 hrs by car.) Overnight stay at Muslibegovic House <http://www.muslibegovichouse.com/>. Address: Osman Dikica 41, Mostar, 8800. Telephone: +387 36 551379

#### **Friday 4 October**

09:00 – 15:00: Board + secretariat (+project coordinators a.o.) Visit University of Mostar and partners. Purpose: see hands-on project activities (“field visit”). Contacts: Ana Sabljo (Faculty of Agriculture and Food Technology University of Mostar mob. +387 63 423 971), Danijela Petrović (Faculty of Agriculture and Food Technology University of Mostar) Alisa Hadžiabulić (Agromediterranean faculty University of Dzemal Bijedić)

- 9.00-10.00: A short welcome at the University, projects presentations and discussion. Presenation held by: Ana Sabljo (Faculty of Agriculture and Food Technology University of Mostar mob. +387 63 423 971, email: [ana.sabljo@sve-mo.ba](mailto:ana.sabljo@sve-mo.ba)), Danijela Petrović (Faculty of Agriculture and Food Technology University of Mostar mob. +387 63 318 719, email: [danci.petrovic@gmail.com](mailto:danci.petrovic@gmail.com)), Adrijana Filipović (mob. + 387 63 355 000;

email. [adrijanamajic@hotmail.com](mailto:adrijanamajic@hotmail.com)) Alisa Hadžiabulić (Agromediterranean faculty University of Dzemal Bijedić, 0038763315191, email: [alisa.hadziabulic@unmo.ba](mailto:alisa.hadziabulic@unmo.ba))

- 10.00 – 10.20 coffee break
- 10.20-10.35: “Providing genetic diversity and healthy plants for the horticulture in Bosnia & Herzegovina.” Visiting the faculty and laboratories. Contact: Ana Sabljo (mob. +387 63 423 971, email: [ana.sabljo@sve-mo.ba](mailto:ana.sabljo@sve-mo.ba)), Jure Beljo.
- 10.35 –10.50: Visit to the laboratories for virus analysis at the institute. Contact: Ana Sabljo
- 10.50 – 11.50: “Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing.” Visit the goat farm near Široki Brijeg. Contact: Danijela Petrović (mob. +387 63 318 719; email: [danci.petrovic@gmail.com](mailto:danci.petrovic@gmail.com))
- 11. 50 – 12.40: Visit to the collection surface to university field in Rodoč (visit field collection in Rodoč). Contact: Ana Sabljo
- Lunch at restaurant Romanca in Konjusi bb Mostar (<http://hercegovinavino.com/hr/romanca/contact>). Lunch with HERD representatives, representatives from Agromediterranean faculty University of Dzemal Bijedić: Semina Hadžiabulić, Alisa Hadžiabulić, and representatives from Faculty of Agriculture and Food Technology University of Mostar: Stanko Ivanković, Danijela Petrović, Adrijana Filipović, Leona Puljić, Jure Beljo, Ana Sabljo
- Board travels to Dubrovnik (140 km, 2hrs.). Secretariat travels to Split (145 km.)

### **Saturday 5 October**

Board and secretariat return to Norway.

## APPENDIX II.

### **Conference 1 October 2013: Practical use of knowledge and knowledge transfer, institutional development and, sustainability related to agricultural activities.**

Venue: Hotel Radon Plaza, Sarajevo, Bosnia & Herzegovina.

All presentations can be accessed on <http://www.umb.no/noragric/article/conference-under-herdagriculture-1-october-2013-sarajevo>

#### **Opening of the conference**

09:30 – 10:00 Registration and coffee

10:00 – 10:10 Introduction HERD/Agriculture by Board Chair Dr. Sissel Rogne

10:10 – 10:30 [Welcoming address](#) by Norway's Ambassador to Bosnia and Herzegovina, Ms. Vibeke Lilloe.

#### **Session 1: Knowledge transfer from academic institutions towards farmers and farmers' organisations, economy and markets.**

Session Chair: HERD/ Agriculture Board Chair, Dr. Sissel Rogne

10:30 – 10:45 [Mineral improved food and feed crops for human and animal health](#). Speaker: Mirha Djikic, University of Sarajevo, Faculty of Agricultural and Food Science.

10:45 – 11:00 [Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing](#). Speaker: Professor Dr Slaven Prodanovic, Faculty of Agriculture, University of Belgrade, Serbia.

11:00 – 11:15 [Agricultural adaptation to climate change - networking, education, research and extension in the West Balkans](#). Speaker: Professor Dr Hamid Custovic, University of Sarajevo, Faculty of Agriculture and Food Science.

11:15 – 11:45 Questions and discussion

11:45 – 12:30: Lunch

#### **Session 2: Agricultural value chains, entrepreneurship and user aspects.**

Session Chair: HERD/ Agriculture Board member, Kari Redse Håskjold

12:30 – 12:45 [The use of natural zeolite \(clinoptilolite\) for the treatment of farm slurry and as a fertilizer carrier](#). Speaker: Dr Vesna Rakic, Faculty of Agriculture, University of Belgrade.

12:45 – 13:00 [Development of education and transfer of knowledge in the area of food technology – EDUFOOD](#). Speaker: Prof. Dr. Midhat Jasic, Tuzla University.

13:00 – 13:15 [Evaluation of fruit genetic resources in Bosnia-Herzegovina with the aim of sustainable, commercial utilization](#). Speaker: Dr. Fuad Gasi, Faculty of Agriculture and Food Sciences, University of Sarajevo.

13:15 – 13:45 Questions and discussion.

#### **Session 3: Quality control of products after international standards.**

Session Chair: HERD/ Agriculture Board member, Anne Kathrine Fossum

13:45 – 14:00 [Manufacture of Traditional B&H Cheeses with Selected Indigenous Bacterial Cultures and Technological Parameters as Basis For Industrial Production](#). Speaker: Prof. dr.

Zlatan Sarić, Faculty of Agriculture and Food Sciences Food Technology Department  
Laboratory of Dairy Science, Sarajevo.

14:00 – 14:15 [Comparison of lamb carcass and meat quality of breeds in Western Balkan and Norway achieving improved palatability, sale and sustainability](#). Speaker: Goran Vucic  
Sci.ass/ PhD, Technological Faculty Banja Luka (Bosnia and Herzegovina).

14:15 – 14:45 Questions and discussion.

14:45 – 15:00 [Communicating research results: More than transfer of knowledge](#). Speaker:  
Joanna Boddens-Hosang, Senior Advisor, UMB, HERD/Agriculture secretariat.

### APPENDIX III. PARTICIPANTS AT CONFERENCE 1 OCTOBER 2013

Amir Lubovac	Expert advisor Ministry of Foreign Trade and Economic Relations. Department for Agriculture, Food, Forestry and Rural Development. Bosnia- Herzegovina	<a href="mailto:Amir.Lubovac@mvteo.gov.ba">Amir.Lubovac@mvteo.gov.ba</a>
Vanja Jovović	Faculty of Agriculture and Food Sciences, Univ. of Sarajevo	<a href="mailto:Jovovic-vanja@yahoo.mail">Jovovic-vanja@yahoo.mail</a>
Hamid Čustović	Vice Dean for Int'l Cooperation, Univ. of Sarajevo, Faculty of Agriculture and Food Sciences	<a href="mailto:Custovic.hamid@gmail.com">Custovic.hamid@gmail.com</a>
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Slaven Prodanovic	Faculty of Agriculture, University of Belgrade, Serbia	<a href="mailto:slavenp@agrif.bg.ac.rs">slavenp@agrif.bg.ac.rs</a>
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Sissel Rogne	Chair of the HERD/Agriculture Board	<a href="mailto:Sissel.rogne@bion.no">Sissel.rogne@bion.no</a>
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Thor S. Larsen	HERD/Agriculture sector manager (secretariat)	<a href="mailto:thor.s.larsen@nmbu.no">thor.s.larsen@nmbu.no</a>
Joanna Boddens-Hosang	HERD/Agriculture secretariat	<a href="mailto:joanbo@nmbu.no">joanbo@nmbu.no</a>

#### **APPENDIX IV. LIST OF APPROVED PROJECTS, FEBRUARY 2013**

**UMB/ Institutt for plante- og miljøvitenskap (IPM)/ Bal Ram Singh:** “Mineral improved food and feed crops for human and animal health.” Partner in Norway Norges Veterinærinstitutt. Partners in Western Balkans: Faculty of Agriculture and Food Science University of Sarajevo, Faculty of Agriculture and Food Technology University of Mostar, Faculty of Agriculture University of Banja Luka, Faculty of Agriculture University of Novi Sad, Faculty of Agriculture University of Osijek, FAVM University of Prishtina. Funded with kr. 4.704.000

**UMB/ Institutt for plante- og miljøvitenskap (IPM)/ Tore Krogstad:** “The use of natural zeolite (clinoptilolite) for the treatment of farm slurry and as a fertilizer carrier.” Partners in Western Balkans: University of Belgrade (Faculty of Agriculture and Faculty of Technology and Metallurgy), University of Sarajevo (Faculty of Agriculture and food sciences.) Funded with kr. 3.843.200

**UMB/ Kjemi, bioteknologi og matvitenskap (IKBM)/ Judith Narvhus:** “Manufacture of Traditional B&H Cheeses with Selected Indigenous Bacterial Cultures and Technological Parameters as Basis For Industrial Production.” Partners in Western Balkans: University of Sarajevo. Funded with kr. 1.935.000

**UMB/ Kjemi, bioteknologi og matvitenskap (IKBM)/ Ingolf F. Nes:** “Study of the microbiological flora of milk and dairy products in Kosovo: with emphasis on pathogenic bacteria and lactic acid bacteria” Partners in Western Balkans: University of Prishtina, Agricultural Faculty and Veterinary. Funded with kr. 2.174.000

**UMB/ Kjemi, bioteknologi og matvitenskap (IKBM)/ Bjørg Egelanddal:** “Comparison of lamb carcass and meat quality of breeds in Western Balkan and Norway achieving improved palatability, sale and sustainability” Partner in Norway: Animalia – Norwegian Meat & Poultry Research Centre. Partners in Western Balkans: Bosnia & Herzegovina: University of Banja Luka, Faculty of Agriculture, Montenegro: University of Montenegro, Biotechnical Faculty, Republic of Macedonia: University of Skopje Saints Cyril and Methodius, Faculty of Agricultural Science and Food. Funded with kr. 5.470.000

**BIOFORSK, Ås/ Peder Lombnæs:** “Grassland management for high forage yield and quality in the Western Balkans.” Partner in Norway: UMB/ IKBM. Partners in Western Balkans: The Faculty of Agriculture, University of Banja Luka , The Faculty of Agriculture and Veterinary in Prishtina, The Faculty of Agriculture, University of Novi Sad. Funded with kr. 3.247.575

**BIOFORSK, Ås/ Dag-Ragnar Blystad:** “Providing genetic diversity and healthy plants for the horticulture in Bosnia & Herzegovina.” Partners in Western Balkans: University "Džemal Bijedid" in Mostar, Agromediterranean Faculty, Mostar , Faculty of Agriculture and Food Technology University of Mostar. Funded with kr. 2.811.000.

**BIOFORSK, Ullensvang/ Mekjell Meland:** “Evaluation of fruit genetic resources in Bosnia-Herzegovina with the aim of sustainable, commercial utilization.” Partners in Western Balkans. University of Sarajevo, Faculty of Agriculture and Food Sciences. Funded with kr. 2.658.000

**Høgskolen i Sør-Trøndelag (HiST)/ Nils V. Juul:** “Development of education and transfer of knowledge in the area of food technology – EDUFOOD.” Partner in Norway: VRI Trøndelag. Partners in Western Balkans: University of Tuzla, Faculty of Technology (main Balkan partner) og University of Novi Sad, Faculty of Technology. Bosnafarm (Zada pharmaceutical) Tuzla (participate with equipment for analysis), Fana Srebrenik, fruit and vegetable processing factory (participating enterprise), Bony Tuzla, juice producing factory (participating enterprise) (not confirmation yet), Solana doo, Salt factory Tuzla, vegetable spices production (not confirmation yet), PMG VIP Gradačac, indigenous fruit processing (participating enterprise). Funded with kr. 3.155.000

**UMB/ Kjemi, bioteknologi og matvitenskap (IKBM)/ Roland Kalleborn:** “Antioxidant Activity and Stability of Bioactive Compounds during Processing of Ceratin Raw Materials of Plant Origin in Bosnia and Herzegovina.” Partners in Western Balkans: University of Sarajevo, Faculty of Agriculture and Food Sciences. Funded with kr. 3.239.000

**Høgskolen i Hedmark/ Lars Erik Ruud:** “Evaluation of cattle welfare and housing in Bosnia and Herzegovina and establishing the laboratory for research in animal welfare, housing and behavior.” Partner in Norway: UMB/ IHA. Partners in Western Balkans: University of Banja Luka, Faculty of Agriculture. Funded with kr. 1.580.000

**UMB/ Noragric/ Bishal Sitaula:** “Agricultural Adaptation to Climate Change - Networking, Education, Research and Extension in the West Balkans.” Partner in Norway: UMB/ IPM. Partners in Western Balkans: University of Sarajevo, Faculty of Agriculture and Food Science, University of Novi Sad, Faculty of Agriculture, University of Banja Luka, Faculty of Agriculture, University of Belgrade/ Faculty of Agriculture. Funded with kr. 3.655.000

**UMB/ Noragric/ Mensur Vegara:** “Research, education and knowledge transfer promoting entrepreneurship in sustainable use of pastureland/grazing.” Partners in Western Balkans: University of Mostar/ Faculty of Agrioculture and Food Technology, University of Banja Luka/ Faculty of Agriculture, University of Belgrade/ Faculty of Agriculture, University of Belgrade/ Faculty of Veterinary Medicine. Funded with kr. 4.559.000