Valorizing the Montenegrin Katuns through sustainable development of agriculture and tourism

KATUN

Introduction

This is the second KATUN project newsletter. The project is aimed to provide knowledge bases for sustainability of the mountain agriculture and to enhance its competitiveness, to preserve important part of the cultural heritage of rural areas and boost the agro-tourism at the katuns. The project in a nutshell was presented in the previous newsletter. Thus, this issue is mainly focused on the activities and results achieved in the second part of the first research year. More details about the project and its activities can be found at project website: www.katun.me

The main results achieved so far

✓ The data obtained through the wide and detailed survey (with detailed questionnaire) on all katun resources were analysed, systematically checked and put into appropriate data bases.
✓ For the purpose of description of the breeds, morphometric characterisation of Bardoka sheep breed was done by measuring the most important body measures, while for the genetic characterisation 160 blood samples of three sheep breeds (Bardoka, Ljaba and Pivska pramenka) were taken and DNA extraction was done. Also, genetic characterization of sheep beta lactoglobulin was done.
✓ Quality and hygiene of raw milk and traditional dairy products on Kuči mountains (Kuči cheese) and on Durmitor area (Durmitor skorup - kaymak) were analysed.
✓ Original technology for Kuči cheese and Durmitor skorup were recorded.
✓ New samples of the soil and plant material were taken at Žabljak (HM Durmitor plots) and with the samples collected in the previous six months, the lab analyses were completed.
✓ Forests of Pinus heldreichii at Kuči mountains were investigated for health status, morphological and genetic characterisation of its symbionts and pathogens were undertaken.
✓ GIS databases concerning forest/bio diversity were designed: for medical plants and fungi and for forests communities,
✓ Transfer of knowledge: 7 trainings and 2 workshops in sustainable agriculture and boosting agro tourism were realized

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The main results achieved so far (part II)

- Concerning the protection of rural heritage, precise determination of location and condition of 63 katuns in 12 areas, their mapping and photo documentation was achieved through 23 field visits.
- A database with 151 katuns with 2224 belonging objects listed is created.
- Significant amount of ethnographic data on katuns’ lifestyle are achieved through archival/librarian researches, but also through oral interviews with farmers during field work.
- Key tourist resources (e.g. natural and cultural heritage) and activities (e.g. recreation, gastro) are identified and described in sense of level of attractiveness; Key tourist routes that link katuns with existing and potential attractions and activities are identified.

In order to realize the next research activities on the “KATUN” project, 2 new young researchers were selected:

Milena Đokić is engaged in Katun project as a young researcher for the characterization of livestock breeds. Last year, she finished her postgraduate special academic studies with thesis „Application of Genomic Selection in Cattle“. Now she is a student on master academic study at Biotechnical faculty. Professional training during nine month she worked on Biotechnical faculty, when she was involved in teaching, work in laboratories, field work. Milena is a winner of the award Capital city of Podgorica for 2013, University of Montenegro Award for 2014, the award of the Biotechnical Faculty and the Ministry of Agriculture and Rural development.

Dragana Drobnjak is engaged in Katun project as a young researcher for empowerment of farming at the katun. She finished her postgraduate special academic studies with thesis „Production of meat beef in the European Union“ at BTF in 2015. During nine months she worked on Biotechnical faculty (professional training), where she was involved in laboratory and field work. She is a student on master academic study at Biotechnical faculty.
The KATUN project research activities are realized in close collaboration with our international partners. In the following text, brief introduction of the partners and their role in the project are presented.

1. University of Ljubljana - Biotechnical faculty

The mission of the Biotechnical Faculty is to provide university level, advanced professional, and postgraduate education, as well as to carry out scientific research and technical and consulting work concerning the sciences of living nature, agriculture, forestry and fisheries, and the related production technologies. The Faculty's scientific and research work combines basic, applied and developmental research work, enabling the rapid transfer of research results into practice.

In realization of the KATUN project activities Department of Animal Science is involved, with its two units: a) Chair for agricultural economics, policy and law; and b) Institute for dairy science and probiotics. Prof. Emil Erjavec and Prof. Luka Juvačič from the Chair for agricultural economics were included into the project activities from the very beginning. They worked on preparation of questionnaire for inventory of agricultural resources and activities at katuns). Questionnaire was used for general survey and deep interviews with selected producers at Kuči mountain area (54 households) and in Durmitor region (42 households) during the summer 2015. Additionally, deep interviews with producers who showed entrepreneurial skills and interest to expand their business (16 ) were held in August, with the involvement of both Slovenian and Montenegrin experts. All obtained data were systematized and statistical analysis is processed in collaborative work.

The project collaboration with Department of Animal Science will be continued in many ways. Mobility program - Rural development measure and new CAP of Prof. M.Marković will be realized in this department during first part of July 2016. The main objective of this mobility program is to acquire new knowledge on design and implementation of the rural development measures targeted to the mountain areas in Slovenia, which has had long experience in their implementation.

Mobility program of Dušica Radonjić, M.Sc. will also be realized in Department of Animal Science in the field of animal nutrition, which is very important for the overall development of summer pasture and improvement of livestock production. It is particularly important to examine the quality of pasture in order to get clearer picture of their true value and possibilities for improvement. Hence, Dušica Radonjić started collaborative work with colleagues from this department. She visited Laboratory of animal nutrition in order to get insight into the methods used for determination of fatty acids in milk, what is the topic of her PhD thesis.
**BF Ljubljana - Institut for dairy science and probiotics** is also involved into the KATUN activities in the area of dairy products (cheese and skorup – kaymak), primarily in Creation of the new dairy products, new types of cheese at HM Durmitor (semi-hard cheese and cheese with aromatic herbs), and two types of goat cheese at “Inter tehna” company, (semi-hard and white brined cheese); and Establishing producer’s association in order to promote and protect origin (PDO) of chosen dairy products from Kuči and Durmitor area and preparation of the application for their PDO; collection of the relevant data (according to the national Law) for writing the PDO Application for chosen dairy products.

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**2. University of Basilicata**

The University of Basilicata is a public State University, located in Potenza and in Matera, inside a Basilicata Region in Southern Italy, well known for its agricultural, cultural and touristic vocation. It comprises of several schools and departments, research centres, interuniversity, excellence centres and laboratories, all engaged in preserving and stimulating the cultural, economic and environmental heritage of the region. One of the Departments of the University of Basilicata is the SAFE School, focused on activities connected with agriculture, forestry, food technology and environmental management.

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Prof. Pietro Picuno, PhD, from SAFE, took a significant part in realization of KATUN project’s activities, mostly in knowledge transfer in different aspects of agro tourism from Basilicata Region to stakeholders in Montenegro. In October 2015, he presented the Southern-Italian experience with introduction of family run agro tourism enterprises to farmers from Durmitor and Kuči areas.

Prof. Picuno gave the lecture at FTHM concerning agro-tourism, where the students and representatives of local tourism, were in position to learn more about Italian experiences in agro-tourism development. At the same time, he helped the dissemination activities of the project team and results of their research at the international conference 44th international Symposium *Actual Tasks on Agricultural Engineering*, held in Opatija in Feb. 2016. His is also very active in initiatives for upgrading project activities through attempts of joining other EU funded projects, especially those from ADRION call.
Swedish University of Agricultural Sciences (SLU)

provides research, education and environmental monitoring and assessment over the wide-ranging fields of agriculture, forestry, food industry, environmental sciences, veterinary medicine and biotechnology. Research and education at SLU spans the range from genes and molecules to biological diversity, animal health, sustainable forestry and food supply.

**Department of Forest Mycology and Plant Pathology**, one of 39 Departments of SLU, conducts both fundamental and applied research, focused on interactions involving plants, pathogenic, symbiotic and saprotrophic fungi and other microorganisms and their roles in forest and agricultural systems.

The areas of research of Department of Forest Mycology and Plant Pathology of SLU in the KATUN project are **forests and biodiversity**. The research activities are focused on distribution of *Pinus heldreichii* forests in Kuči mountains area, with aim to make inventory and characterisation of forests and fungi diversity. *Pinus heldreichii* forests in Montenegro are unique and are very important component for conserving the biodiversity. It is tertiary relict and subendemic on western Balkans, inhabiting a forest zone on upper forest line on high mountain regions exposed to certain influence of the Mediterranean climate (alt. 1200-2000 m), on limestone terrains. They also provide many forest ecosystem services in mountain region, which are of crucial importance to the society, including protection against gravitational natural hazards (erosion, avalanche, rockfall), non-wood forest products, etc. *P. heldreichii* forests today are often endangered by forest fires.

Pathogenic and symbiotic fungi influence health status of forest tree. Besides, symbiotic fungi are necessary for normal growth of pines. However, there is little or no data about community structure of needle pathogens, symbiotic fungi and other rhizosphere fungi associated with *P. heldreichii*.

Therefore, the experts from BTF and from SLU, Dr Rimvyys Vasaitis and Dr Audrius Menkis developed the appropriate sampling strategy and checked it in the field. Transfer of knowledge from the SLU researches to researchers at BTF was conducted in October 2015. The representative research sites were selected, visited and assessed for their suitability for the studies on fungal symbionts and pathogens and collection of representative plant materials.

Later, BTF researcher Dr Jelena Lazarević was trained at the SLU for morphological and molecular identification of fungal symbionts and pathogenic fungi from the materials of *P. heldreichii*. Needle samples from 5 localities were processed, and samples were prepared for high-throughput sequencing. Generated sequence data will be analysed using bioinformatics in collaborative work between BTF and SLU researchers. Field and laboratory work will be continued during second project year, mainly with symbiotic fungi.
4. Institute of technologies applied to cultural heritage - ITABC, Italy

ITABC combines the so-called "hard sciences" with the "human sciences" with the construction and refinement of a common language in research applied to cultural heritage. It implements and optimizes new methodologies and technologies of investigation to study the territory and its historical artifacts. The new methods and technologies in the are intended to create a new knowledge, enhance and enjoy cultural, archaeological and architectural heritage in Italy and abroad. The policy is to develop strategies for preventive conservation and management of cultural resources representing an innovative approach to the protection, conservation and enhancement of cultural heritage in all its complexity.

In realization of the KATUN project activities, the researchers from HIM collaborate with the colleagues from the Virtual Heritage Lab of CNR-ITABC, that is focused on the use of digital technologies for archaeology and enhancement of cultural heritage. The Lab carry out projects ranging from surveying and implementation of geographic information systems to the virtual reconstruction of landscapes, sites and artifacts with the aim to represent historical processes through interaction in immersive environments. The Lab is currently working on several European and national projects and is one of the leading Italian centers as regards multimedia and virtual reality in development of cultural heritage.

Mobility training “Education in application of IT technologies in heritage protection” for two researchers from HIM (Dr. Ivan Laković and Dr. Tatjana Koprivica), was realized in Dec. 2015 at ITABC, Rome. They were introduced to application of modern IT techniques and procedures of treatment of cultural and historical heritage (integrative approach to joint archaeological-architectural research of material heritage, geomorphologic and geophysics analyses in archaeological researches, photogrammetry and reconstruction of the potential past landscapes; procedures and methodologies of digital presentation, topographical research methodologies, spatial analyses and GIS equipment), as well as multidisciplinary researches for analysis, documentation, evaluation, recovery, conservation and exploitation of the built heritage.

In March 2016, HIM organized workshop “IT technologies in cultural heritage protection, preservation and valorisation”, guided by Dr. Sofia Pescarin, from CNR-ITABC. The main issues were: applications of procedures and methodologies of digital presentation of cultural heritage, topographical research methodologies, 3D modelling of cultural heritage objects and spatial analyses and GIS equipment.

The activities with ITABC-CNR will be continued during the second project year (field work, 3D modeling of the typical huts, digital terrain data analysis and development of 3D elevation terrain model of Kuči Mountains and Durmitor).
In the project implementation, the commercial companies play very important role: HM Durmitor Žabljak, The Old House doo, Podgorica and Inter tehna doo Berane.

"HM Durmitor" Žabljak

The main activities of the company are tourism, agriculture and commerce. In addition to hotel "Žabljak", and restaurant "Momčilov grad", HM Durmitor owns 350 ha meadows and pastures and sheep farm with more than 700 breeding animals, located about 4 km from center of Žabljak. It is the largest sheep farm in Montenegro. It is engaged in organic production and produces certified products: lamb meat ad mutton, dairy products ("skorup", low fat sheep cheese "Prilo" and special dairy product named "saljevak"). This company has its own katun Dobri Do, located in high mountain area of Durmitor, 20 km from Žabljak at about 1900 m of altitude. During summer (from middle of June to beginning of August) sheep flock moves from Žabljak area to Dobri Do. This aspect of livestock production in HM Durmitor is especially interesting for KATUN project.

HM "Durmitor" is involved in the most KATUN project activities. The trainings, workshops, field demonstration are organized at farm or in fields of HM Durmitor. Very important mutual task is work on creation of new dairy products (cheeses), what is supported by BTF expertise, but also through engagement of Prof Dr Bogdan Perko from Slovenia, as a consultant for this specific activity. Also, the equipment for this purpose (vacuum packing machine, press with molds) was purchased from the project resources.

In order to improve fodder production, new trial field was cultivated and sown this springs. User friendly manuals for sheep and cattle rearing are under preparation, with special focus on beef cattle breed Angus, which the company is going to purchase very soon.

Promoting and marketing activities in the Durmitor area, planned through the project, are focused on HMD company and family producers from surrounding. Special focus will be on enhancing of agro tourism at HMD katuns in Dobri Do, and spreading positive experience to other households.

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Tel.: +382 (0) 77 400190, "HM Durmitor" is a part of "The Hotel Management Aktiengesellschaft" that has been operating in Montenegro since 2004.
“The Old House” doo Podgorica

is a leading company in tourism and agriculture on Kučići mountains. It promotes the traditional values in its business approach, based its image on the cultural and economic heritage of the region. Connecting the national cuisine, accommodation facilities in traditional style and agricultural products, the company build its reputation through a recognizable offer that resembles on the local history and promotes local products, through the resort (lodges, restaurant, ski resort for kids, playgrounds etc) at the Kućka Korita (30 km from Podgorica), national cuisine restaurant in Podgorica and farm at Donje Stravče, on the foothills of Žijevo mountain. The vision is to have the autochthonous agricultural products for the tourism facilities. There are several on-going activities on valorisation of local potentials in tourism and market activities (organic agricultural production, creation of new products and improvement of present marketing lines).

Within the KATUN project company is supported by the project partners in improving and enriching its agricultural and tourism offer, eliminating the bottlenecks in present activities and boosting the economic development of the area in whole. This is done through support of organic vegetable production, branding and promoting traditional meals and products and provide the infrastructural support to other project activities.

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D.O.O INTERTEHNA – Berane

was established in 1990. An important part of the activities is agriculture –bee keeping and goat farming with cheese production. It started with small flock of the purebred Alpine goats (20 doers) now reached 250 milking doers. Parallel, it has been expanding facilities for cheese making and today processes 2000 litres of milk daily, from its farm and from nearby farmers. The range of products is large (soft cheese, semi-hard cheese, whey, kaymak, albumin cheese etc.). So far, INTERTEHNA has received several awards: Best goat farm at Regional exhibition in Berane (2013), Great gold medal for the goat cheese at 78th Fair in Novi Sad (2011) and Gold medal for the goat cheese at 79th Fair in Novi Sad in 2012.

It is a new KATUN project partner (since May 2016), that is included into creation of new dairy products, branding and promoting traditional products. The existing goat farm will be supported by experts’ knowledge and analysis of quality of dairy products will be done. In the special focus of the mutual work will be creation of new two types of goat cheese - semi-hard and white brined cheese). The equipment for this purpose (vacuum packing machine, press with mold) was purchased from the project resources. Other important aspects of goat breeding and cheese making will be developed too (education how to improve technology and quality of dairy products and how to develop recognizable packaging for new cheeses).
The KATUN project team is glad to announce

**International conference**

**Sustainable Development of Mountain Areas**

- Experiences, challenges and perspectives -

Žabljak, Sept. 14-16, 2016

MONTENEGRO

The Conference is organised in collaboration of all project partners and in association with MONTENEGRIN ACADEMY OF SCIENCE AND ARTS.

The conference will be focused on the social, cultural and business environment in development of mountain areas, specifically on:

- Social innovations and entrepreneurship in rural development
- Sustainable agricultural production in mountainous areas, especially on katuns
- Promotion and protection of the traditional products
- Ecological system services in mountainous areas, environment and biodiversity protection
- Sustainable eco-rural tourism
- Cultural-historical heritage: story, material, the perspectives

Round table on ideas and recommendations for further development of the katuns will be organized at the end of the program.

The eminent experts will act as keynote speakers on the Conference:

- **Prof. Dr Stefano Grego**, FAO, World Agricultural Heritage Foundation
- **Prof. Dr Emil Erjavec**, University of Ljubljana, Biotechnical faculty
- **Prof. Dr Natalija Bogdanov**, University of Belgrade – Faculty of Agriculture
- **Prof. Dr Giovanni Giuseppe Vendramin**, Inst. of Biosciences and Bioresources, CNR Italy
- **Prof. Dr Jelena Erdeljan**, University of Belgrade - Faculty of Philosophy
- **Dr Izidora Marković Vukadin**, Institute for tourism, Croatia
- **Dr Marija Klopčić**, University of Ljubljana, Biotechnical faculty

For more information on KATUN project visit our web site [www.katun.me](http://www.katun.me).


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