TRAINING MASTERS IN ECOSYSTEM SERVICE MANAGEMENT IN PROTECTED AREAS - ECOSERVE

SĂLĂȘAN COSMIN*[1], TSERENNADMID SUKHTULGA[2], YAMPILOVA ZOYA[3], MOLA-YUDEGO BLAS[4], VEGA-GARCIA CRISTINA[5]

[1]Banat University of Agricultural Science and Veterinary Medicine "King Michael I of Romania" from Timișoara/Faculty of Management and Rural Tourism, Romania

[2]Mongolian Life Sciences University, Ulaanbaatar, Mongolia

[3]Buryat State Academy of Agriculture, Ulan Ude, Buryat Republic, Russian Federation

[4]University of Eastern Finland, Joensuu, Finland

[5]University of Lleida, Lleida, Spain

*Corresponding author's e-mail: cosminsalasan@gmail.com

Abstract: *Addressing the ecosystem services produced by forests have been the focus of international debated during the past decades, including important events such as the RIO-20 summit, the EU Biodiversity Strategy. An important volume of research projects and desk researched address the topic while interface to policy making and development planning took place in parallel. Given the context, the importance and the impact of ecosystem services' management and value of protected areas in Central Asia, a consortia of 14 institutions: six EU universities, four universities form Central Asia and five non-academic partners including national and local authorities and NGOs proposed and contracted an Erasmus+ Capacity Building project, Training Masters in Ecosystem Service Management in Protected Areas - ECOSERVE. The description of the approach and its implementation are detailed in the present paper for inspiration and illustration of public and private responsibility towards nature and its future.*

Key words*: ecosystem services, capacity building, MSc degree*

INTRODUCTION

Ecosystem services (ES) could be broadly defined as the sum of benefits we humans receive from the natural environment; often taken for granted [18]. Research focused on ES operates with measures and methods to gauge both goods and services as well as addressing changes in the use of services as a result of adapting to local or regional conditions. ES are mainly categorized in: provisioning, regulating, cultural and supporting services [10, 16, 17]. In environmentally conscious societies, citizens are increasingly willing to pay for those services, directly or indirectly related to their life quality [1]. In this sense, the US Environment Protection Agency offers early education packages for 4-6 grade pupils in order to get them familiarized with ES concepts [19]. Tackling the interest for the interaction of farmers' collective actions and ecosystem services driven payments by the fact that spatially coordinated conservation practices can prove environmentally of higher effectivity leads to the finding that most farmers are rather pessimistic [15]. Systematizing and analysing the limitations of policy tools that are market-based in improving the provision of ecosystem services, Muradian et al. [9] finds that hybrid regimes are more suitable. Farley [4] states that the ecosystem services concept is a valuable economic analysis tool and shouldn't be disregarded only due to disagreements of economic assumptions concerning sustainability, efficiency, or justice; adjustments should be performed in adapting the institutions to the physical environment and not the other way around. Strict economic appraisal of ecosystem services can well serve for building indicators sets and value estimates, de Groot et al. [5] after screening 320 publications reflecting over 300 case studies and 1350 of value estimates, apprising 665 values finds ranges with amplitudes from 490 - 350000 USD/ha annually (most of these values are not linked to the market and therefore non-tradable benefits). Forest ecosystem indicators

proposed by Tiemann and Ring [14], drinking groundwater, provision of timber, regulation of global climate, local reduction of air pollution, recreation, education and training, secure the forest mapping as ecosystem service appraisal. The economic benefits of biodiversity and ecosystems service need a superior consideration in terms of contribution to the welfare of the society at large [13]. Exploring the link and interactions between ecosystem services, biodiversity, and conservation policy Maestre et al. [8] indicates that a necessary yet insufficient condition for a transition to a sustainable economy is that conservation of biodiversity (analysis) take into account undesirable and preventable (indirect) effects of biodiversity policies. Mapping and assessing ecosystems at European scale requires precise identification of knowledge gaps and a coherent methodology to answer the EU Biodiversity Strategy 2020 [7]. Measuring and valuing services doesn't lead directly to improved use of knowledge while current governing ecosystem services are basing decisions on traditional knowledge compartmentalised to specific geographical areas and sectors, habitats, or ecosystems [12]. The assessment of the cultural component of the ecosystem services (CES) as methodological framework bridges the spaces between sustainable development and heritage. A set of 36 indicators was screened by Lopez Sanchez et al. and observed that the large majority prove a good potential for the heritage where half of them were already used in different studies [6]. A considerably wider set of indicators (109) was used to acknowledge the ecosystem services in intermittent rivers and ephemeral streams involving the broadest audience in a participatory process and thus ensuring broad understanding for large audience maintaining the importance of public preferences in the design of socially-accepted policies [11]. Urban development needs to quantify with a higher accuracy the effects of planning decisions Cortinovis and Geneletti detailing 7 urban regulating ESs [2].The interest and the research results in the field of ES are well highlighted a decade ago by Constanza and Kubiszewski inventorying the period 1990-2011 and finding 2400 papers listed in Web of Science outputted by 2000 authors out of which 172 authors published half of the total [3].

MATERIALS AND METHODS

The employed method is the review as descriptive narrative of the project logic and approach and the implementation as it occurred during the shortened duration of the project. Highlights are given over the objectives, target group, advantages, and precise activities with the aim of linking the implementation effort with the overarching objective of developing the institutional capacity of the stakeholders in the region with particular emphasis on universities to implement and deliver master's education in the field of ES management for the protected areas.

RESEARCH RESULTS

The approach was properly refined three times before successful contracting and aiming to provide for the administration and management of the protected areas in Central Asia the knowledge, skills and competencies needed for the administration and long-run planning of the respective natural reserves. Centrally to the approach was placed the development of the institutional capacity to structure, develop and deploy a master's degree for the future managers and employees of the natural parks, natural reserves, and other protected areas. The first enrolling period was planned for the winter semester of 2022 and while most of the activity in the project was implemented online, few activities could take place face-to-face, as planned both in Europe and Central Asia. Nevertheless, the structure, content and more importantly the results of the activities were delivered as initially designed, both timely and conform to the quality requirements.

The ECOSERVE project. The contract awarded is co-funded by the Erasmus+ of the European Education and Culture Executive Agency (EACEA) of the European Commission. Over the past thirty years protected areas and sectors with particular value in terms of environment constantly grew as popularity in the public policy interest and research focus worldwide. That interest fed the international community in drawing strategic approaches regarding the potential of these areas and also in the field of education as major duties for the current century. A practical-based innovative master's program incorporating the European Credit Transfer System for delivering the management competencies for protected areas. The proposed network activities are meant to comply and provide for the requirements of the labour market and the sustainable development, generally.

The learning resources of the program developed in English, Mongolian and Russian languages are in constant monitoring and update and distributed by the active involvement of the resource centres for environment services as network nodes. The centres' inner further development relies on international and trans-national activities meant to answer the preservation of biodiversity and management of protected areas.

Universities in Central Asia implement and deliver the new master's program in Ecosystem Service Management for Protected Areas in both Russian and Mongolian Higher Education Institutions. The new program creates the grounds for a long-run partnership among the universities and the actors and stakeholders, outputting in the future the professionals expected and required by the public structures, private players, and tourism operators. The Sustainable Development Goals are integrated in the approach of the new program by synchronising the strategies' design for all type of interventions over the ecosystem resources from land to climate factors.

Objectives of the Project. The central project's objective consists of the master's study program for ecosystem service management in protected areas as consistent and coherent answer to the need of experts and professionals in both private and public specific services. Jointly with the non-academic partners in the project the Russian universities (Buryat State Agricultural Academy and Ulyanovsk State Agrarian University) and Mongolian universities (Mongolian University of Life Sciences and private university Eco-Asia EMU) structure, develop, consolidate, and deliver the afore mentioned master's program.

Recipients of the project

- *Employees and management of protected natural sites*. Most of which are updating and upgrading their professional competences with the aim of delivering integrated actions throughout different ecologic projects/programs as part of their day-to-day job;
- principles. *Where particular* needs related to their research activities requires components of the master's program on management of the ecosystem services (ES);
- *Management and employees of different structures*. Where activities' impact is linked to adverse influences over the ecosystem and where integration of eco-efficiency and eco-equity is required for further delivery of their actions;
- *Private operators*. Capable and willing to contribute with financial resources for green management as part of their business or charitable contribution;
- *Anyone*. Prepared to reconsider their current professional activity and ready to integrate the ethics of ecosystem services.

The ECOSERVE project's aim is to assist and support students in developing a complete perspective regarding the ES and develop knowledge and awareness regarding the common responsibility for environment degradation and ecosystem protection. Training and educating for professionals and executives face the challenge of a dense issue and complex reality and invites for diversified attitudes and methodologies according to the level of intervention. Further and advanced levels of thinking for program participants, commitment, and awareness demands for broad and multithread environmental scanning and ecosystem investigations, particularly in protected sites.

The perspective and current circumstances demand new and improved teaching methods, new means in sustaining the academic staff development while employing innovative techniques and advanced appraisal tools allowing the students to acquire new transversal and society-oriented competences in the fields of sustainable development, ES and biodiversity preservation.

The fourteen initial project partners include academic, non-academic, administrative structures and NGOs where the higher education institutions as majority type of actors originates from six countries four in EU (Finland, Italy, Romania, and Spain) and two in Central Asia (Mongolia and Russian Federation).

The project's duration of three years started the15th of January 2021 and was supposed to end the 14th of January 2024, still given the decision of EACEA the last implementation month will be July 2022.

The main goal of the ECOSERVE project is the elaboration and implementation of a master's degree program in each partner university from Central Asia, delivering the future specialists in ES in protected sites to answer for the increasing regional demand for professionals and management staff as well as for related public or private business linked to the respective natural parks and reserves or other specially designed areas. Considering the limitations and requirements of the public health crisis during the COVID-19 pandemic, the kick-off meeting of the project was organised and deployed exclusively online (March 11th, 2021) yet allowing partners to acknowledge the immediate and future specific workloads, deadlines, and other implementation specific topics.

Based on the EU partners' experience in curricula development for study programs, experience accumulate in prior and current project-based activities and adjusting the structure and contents according to the national specific requirements in terms of accreditation as well as amending the program subject list and contents corresponding to the expectations of the employers, leads towards a success product outputting graduates in accordance with the current market expectancies. The advantages generated by the new program can be summarized as:

- Project activities and the generated study program lead to highest possible employment chances for the new MSc. graduates both in Mongolia and Russian Federation as well as in other countries in the region;
- Master's program curricula incorporates innovative contents, subjects, methods, and tools, considering the fact that this type of program does not exist currently in any of Central Asia partner. Incorporating a number of subjects in English language facilitates the cross-access for the students willing to enrol in a particular campus, as well as for the students from the other countries in the region accessing them as mobility or full-time program;
- Important updates and upgrades in terms of equipment and teaching support is foreseen for the partner universities in the area leading to a wider modernisation process with benefits at institutional scale;

- The largest part of the implementation process, as two thirds of project's duration, is dedicated to organisation, planning, structure, and content development for the new master's program in ESM in protected areas. The link with the society at large, administration, NGOs and business is permanently checked along the entire series of processes to ensure solid and relevant education for the future professionals and managers;

ECOSERVE activities. Specific capacity building activities for projects developing new study programs are foreseen and grouped in a dozen of events where seminars, workshops, trainings, internships, and conferences mobilises over one hundred persons. The reversed timeline of the project is presented bellow starting with the most recent:

- 7th ECOSERVE International Project Board (IPB) Meeting February 22nd, 2022;
- Attending the scientific-methodological conference "Innovative technologies in higher education" December 21-22, 2021. Local Working Group (LWG) members and representatives attended the conference "Innovative technologies in higher education", hosted by Ulyanovsk State Agrarian University;
- ECOSERVE new project partners' meeting, December 10, 2021. University of Zaragoza as newly added partner in the project's consortium (replacing an outgoing partner) met the project leader at the University of Lleida;
- Innovative Teaching & Learning Methods workshop organised the 24th of November, 2021;
- Regional LWG members attending online international conference "Integration of education, science and business in modern conditions" November 18, 2021 at the Institute of Economics and Law;
- 6th ECOSERVE IPB Meeting 17th November, 2021. Project's progress assessment presented by the consortia members;
- Working meeting 03.11.2021. Russian and Mongolian partner universities organised a regional meeting at the initiative of the Mongolian LWG to advance on curricula development;
- #ErasmusDays 15th October, 2021. Ulyanovsk State Agrarian University presented the CBHE project "Training Masters in Ecosystem Services Management in Protected Areas" during the events organised during the Erasmus Days;
- #ErasmusDays in BSAA, October 14, 2021. A dissemination event supported by the International Department in BSAA was organised;
- 5th ECOSERVE IPB, 13th October, 2021. The scheduled meeting for progress assessment took place with all partners participation;
- Participation in the All-Russian Conference "Development of rural tourism as a tool for the development of rural areas", 18-20th of September, 2021. The Republic of Buryatia welcomed the All-Russian Conference on the development of rural tourism;
- 4th ECOSERVE IPB, September 14th, 2021. Online IPB meeting with the participation of all consortia partners assessed the progress of projects' implementation;
- GREEN INTERNATIONAL ERASMUS+ SUMMER WEEK, July 26th to 30th important international event held at the Banat University of Agricultural Sciences and Veterinary Medicine "King Michael Ist of Romania" with the participation of colleagues from BSAA from Ulan Ude.

- "Training Masters in Ecosystem Services Management in Protected Areas" - ECOSERVE starts, 2021, March 11. Formally, the projects partners attend and assume the specific workloads, deadlines, results and outputs as well as all financial requirements for a sound implementation;
- ECOSERVE 1st Monitoring Progress Meeting 2021, July 1st, an online meeting of the project working group was held. During the meeting WP heads presented reports concerning issues of the project implementation, specifically work packages and events. Also, schedule and plan of further activities were discussed. It should be stressed that implementation of the project ECOSERVE "Training Masters in Ecosystem Services Management in Protected Areas" goes on as planned despite the current epidemiological situation in the world;
- Working process. Aleksandr Toigildin about the Erasmus+ project and Ulyanovsk agrarian university

CONCLUSIONS

The need for advanced and specialised competencies in the field of ecosystem service management in protected areas in Central Asia was building up over the past decades. The ECOSERVE project ensured the transfer of modern, adjusted, and relevant skills and competencies as well as the capacity to open a master's programme for the preparation of the next generation of employees and managers hosted at four partner universities from the region. Although the implementation of the project started with a delay, further confronted with the lock-down and public health requirements during the pandemic of COVID-19, moreover, forced to conclude the activities earlier than planned, the international partnership managed to secure the outputs and outcomes as proposed by the project's approach and designed implementation arrangements. The review of the successfully concluded activities as well as the projected approach could further serve as inspiration to other regions and countries actively seeking to improve decision-making and policy integration of their ecosystem services for the benefit of the entire society and indirectly contribute to global improvement of the ecosystem.

ACKNOWLEDGEMENTS

The authors wish to express their gratitude to EACEA of the European Commission for the support granted in the implementation of the project ERASMUS+ 619060-EPP-1-2020-1-ES-EPPKA2-CBHE-JP ECOSERVE within the frame of Erasmus+ Strategic Partnership Key Action 2.

REFERENCES

[1]. BALLOFFET N., DEAL R., HINES S.., LARRY B., SMITH N., 2012, Ecosystem Services and Climate Change, U.S. Department of Agriculture, Forest Service, Climate Change Resource Center. www.fs.usda.gov/ccrc/topics/ecosystem-services

[2]. CHIARA CORTINOVIS, DAVIDE GENELETTI, 2019, A framework to explore the effects of urban planning decisions on regulating ecosystem services in cities, Ecosystem Services, Volume 38, 100946, ISSN 2212-0416,https://doi.org/10.1016/j.ecoser.2019.100946

[3]. ROBERT COSTANZA, IDA KUBISZEWSKI, 2012, The authorship structure of "ecosystem services" as a transdisciplinary field of scholarship, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.06.002

[4]. JOSHUA FARLEY, 2012, Ecosystem services: The economics debate, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser. 2012.07.002

[5]. RUDOLF DE GROOT, LUKE BRANDER, SANDER VAN DER PLOEG, ROBERT COSTANZA, FLORENCE BERNARD, LEON BRAAT, MIKE CHRISTIE, NEVILLE CROSSMAN, ANDREA GHERMANDI, LARS HEIN, SALMAN HUSSAIN, PUSHPAM KUMAR, ALISTAIR MCVITTIE, ROSIMEIRY PORTELA, LUIS C. RODRIGUEZ, PATRICK TEN BRINK, PIETER VAN BEUKERING, 2012, Global estimates of the value of ecosystems and their services in monetary units, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.07.005

[6]. MARINA LÓPEZ SÁNCHEZ, ANTONIO TEJEDOR CABRERA, MERCEDES LINARES GÓMEZ DEL PULGAR, 2020, The potential role of cultural ecosystem services in heritage research through a set of indicators, Ecological Indicators, Volume 117, 106670, ISSN 1470-160X, https://doi.org/10.1016/j.ecolind.2020.106670

[7]. JOACHIM MAES, BENIS EGOH, LOUISE WILLEMEN, CAMINO LIQUETE, PETTERI VIHERVAARA, JAN PHILIPP SCHÄGNER, BRUNA GRIZZETTI, EVANGELIA G. DRAKOU, ALESSANDRA LA NOTTE, GRAZIA ZULIAN, FAYCAL BOURAOUI, MARIA LUISA PARACCHINI, LEON BRAAT, GIOVANNI BIDOGLIO, 2012, Mapping ecosystem services for policy support and decision making in the European Union, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.06.004

[8]. SARA MAESTRE ANDRÉS, LAURA CALVET MIR, JEROEN C.J.M. VAN DEN BERGH, IRENE RING, PETER H. VERBURG, 2012, Ineffective biodiversity policy due to five rebound effects, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.07.003

[9]. ROLDAN MURADIAN, LAURA RIVAL, 2012, Between markets and hierarchies: The challenge of governing ecosystem services, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.07.009

[10]. NATIONAL WILDLIFE FEDERATION, UNITED STATES, 2022, https://www.nwf.org/Educational-Resources/Wildlife-Guide/Understanding-Conservation/ Ecosystem-Services

[11]. PASTOR A.V., TZORAKI O., BRUNO D., KALETOVÁ T., MENDOZA-LERA C., ALAMANOS A., BRUMMER M., DATRY T., DE GIROLAMO A.M., JAKUBÍNSKÝ J., LOGAR I.,. LOURES L, ILHÉU M., KOUNDOURI P., NUNES J.P, QUINTAS-SORIANO C., SYKES T., TRUCHY A., TSANI S., JORDA-CAPDEVILA D., 2022, Rethinking ecosystem service indicators for their application to intermittent rivers, Ecological Indicators, Volume 137, 108693, ISSN 1470-160X, https://doi.org/10.1016/j.ecolind.2022.108693

[12]. EEVA PRIMMER, EEVA FURMAN, 2012, Operationalising ecosystem service approaches for governance: Do measuring, mapping and valuing integrate sector-specific knowledge systems?, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.07.008

[13]. IBRAHIM THIAW, RICHARD MUNANG, 2012, RIO+20 outcomes recognize the value of biodiversity and ecosystems: Implications for global, regional and national policy, Ecosystem Services, Volume 1, Issue 1, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2012.07.013

[14]. ANDRÉ TIEMANN, IRENE RING, 2022, Towards ecosystem service assessment: Developing biophysical indicators for forest ecosystem services, Ecological Indicators, Volume 137, 108704, ISSN 1470-160X, https://doi.org/10.1016/j.ecolind.2022.108704
[15]. SERGIO VILLAMAYOR-TOMAS, JULIAN SAGEBIEL, JENS ROMMEL, ROLAND OLSCHEWSKI, 2021, Types of collective action problems and farmers' willingness to accept agri-environmental schemes in Switzerland, Ecosystem Services, Volume 50, 101304, ISSN 2212-0416, https://doi.org/10.1016/j.ecoser.2021.101304.
[16]. UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE (UNECE), 2022, https://unece.org/ecosystem-services-0
[17]. UNITED NATIONS FOOD AND AGRICULTURE ORGANISATION, 2022, https://www.fao.org/ecosystem-services-biodiversity/en/
[18]. UNITES STATES ENVIRONMENTAL PROTECTION AGENCY, 2022, https://www.epa.gov/eco-research/ecosystem-services
[19]. UNITES STATES ENVIRONMENTAL PROTECTION AGENCY, 2022, https://www.epa.gov/enviroatlas/introduction-ecosystem-services