

CULTURAL ECOSYSTEM SERVICES IN AGROECOSYSTEMS - PERCEPTION OF STAKEHOLDERS - CASE OF BULGARIA

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Abstract

Cultural services as a part of Ecosystem Services represent intangible benefits of ecosystems related to their aesthetic and recreational value, their spiritual characteristics, their educational value, and the creation of an environment for the development of the spirit. Relationship between culture and nature is very important for sustainable agricultural practices and rural landscapes maintenance. Cultural ecosystem services (CES) are perceived strongly by local communities because they are identified with place of living and cultivation of land. The aim of current study was to obtain data on CES perceived by farmers and local residents, based on a raking from 1 to 10 in the Questionnaire to assess cultural ecosystem services and land-use management changes (LUMC) in selected regions in Bulgaria. This investigation was made in the frame of the STACCATO project.

Key words: Bulgaria, Cultural Agroecosystem Services, stakeholders.

INTRODUCTION

Ecosystem Services (ES) - briefly presenting all possible human benefits, identified in several major groups. Cultural services as a part of them represent intangible benefits of ecosystems (Sarukhán and Whyte, 2005). Based on the Millennium Ecosystem Assessment (MA, 2003; 2005) cultural ecosystem services (CES) related to aesthetic and recreational value of ecosystems, their spiritual characteristics, cultural identity and educational value.

Relationship between culture and nature is very important for sustainable agricultural practices and rural landscapes maintenance (Gullino and Larcher, 2013).

In case of change or loss of culture and traditions of local communities related to land management changes the environment and deeply affects the interconnection between humans and nature (Zheng et al., 2015).

In traditional communities CES are perceived strongly by local communities because they are identified with place of birth and traditional agricultural practices are essential for cultural identity (Milcu et al., 2013). This also applies to Bulgaria, whose population has for the most part preserved the rich history, traditions, agricultural practices and their transmission

from generation to generation (Borisova et al., 2015).

The aim was to obtain data on CES perceived by farmers and local residents, based on a raking from 1 to 10 in the Questionnaire To assessment cultural ecosystem services and land-use management changes (LUMC) in selected regions in Bulgaria.

MATERIALS AND METHODS

Case study regions for the assessment of cultural ecosystem services were selected and core issues of interest identified. A Questionnaire was developed for the evaluation of stakeholders' acceptance of cultural ecosystem services, and for the documentation of site characteristics (land management system) as well as social and economic structures of land use (e.g. ownership patterns, export orientation, demographic change). The survey was conducted from April to December 2016 in 11 different villages, in two different regions based on direct face-to-face interaction: South-Central and South-East Bulgaria (Table 1). The work was undertaken through the collaboration of STACCATO researcher partners from the Universitat Autònoma de Barcelona and the Agricultural University of Plovdiv.

Table 1. Study areas in Bulgaria

Bulgaria		
Region	Municipality	Village
South-Central: Plovdiv	Maritsa	Kostievo
	Kaloyanovo	Kaloyanovo
	Kaloyanovo	Duvanlii
	Rhodopi	Tsalapica
South-Central: Haskovo	Haskovo	Haskovo
South-East Yambol	Elhovo	Chernozezen
	Elhovo	Borisovo
	Straldza	Straldza
	Straldza	Malenovo
North Central Pleven	Cherven Bryag	Suhache

On the base of methodological scheme by STACCATO protocols of stakeholders mapping the lists of stakeholders at the regional level was made (Fres Osmán, 2016). It's including the following types of organisations or entities:

- Agrarian Cooperatives Federations;
- Agribusiness companies;
- Agricultural engineers;

- Agriculture departments, including agricultural extension/technology transfer;
- Consumers' organisations;
- Development NGOs;
- Environmental organisation;
- Farmers union;
- Farming associations;
- Green Parties;
- Organic agriculture certification bodies;
- Organic agriculture engineers; developing and conserving local varieties;
- Organic farming associations;
- (Inter) Institutional Programmes/Platforms;
- Public research institutions.

The next step was categorising these organisations. For this an Interest-Influence Matrix (Ackermann and Eden, 2011), a method that classifies stakeholders based on their level of influence and interest, resulting in four types of positioning subsequent recommended strategies. The result of this process is presented in Figure 1.

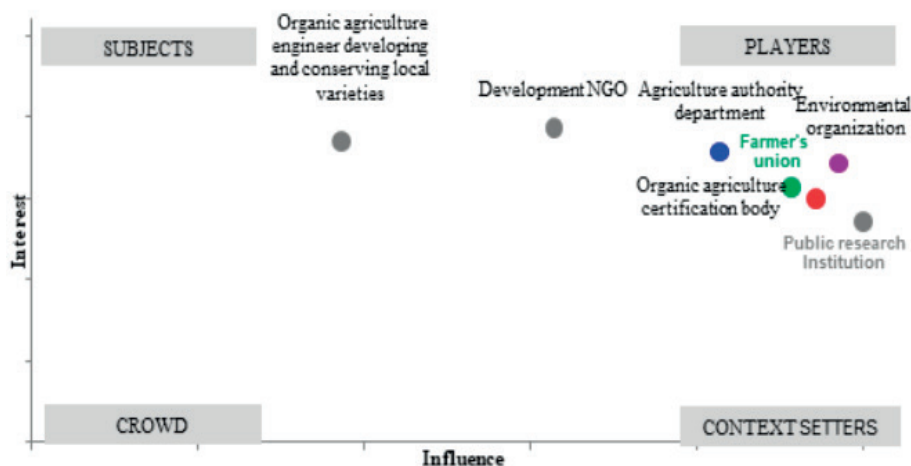


Figure 1. Interest and Influence Matrix of Group B (Plovdiv Region)

In group B (Plovdiv Region), 'Players' were represented by Agriculture authority department, Development NGO, Environmental organization, Organic agriculture Certification Body and Farmer's Union. In this case, Organic Agriculture engineer developing and conserving local varieties was categorized as a 'Subject'. In none of the groups there was any stakeholder that could be categorized as 'Crowd' i.e. 'Potential'.

RESULTS AND DISCUSSIONS

The representative from stakeholders' group was selected for Plovdiv Region (Group B) - based on their willingness to participate in the activity. The types of stakeholders selected, and their main interests and motivations are shown in Table 2.

Table 2. Participant stakeholders in the online consultation in Plovdiv (after Fres Osman, 2016)

Stakeholder type	Main activities	Plovdiv
Agriculture authority department	Formulation of agricultural policy, ensuring that natural resources are used sustainably, ensuring food supplies to the region, promoting the exchange of knowledge and training, promoting regional products.	B1
Development NGO	Protection of biodiversity and reduction of pollution through partnerships with several stakeholders and society.	B2
Environmental organization	Promotion and conservation of flora and fauna, promotion and encouragement of sustainable management approaches by campaigns and projects.	B3
Farmer's union	Representation of farmers interests in relation to the preservation of family farm, fair income, legal framework, and rational land use, production of quality products, protection of cultivated land and the protection of nature.	B4
Farming association	Representation of groups that produce the same type of product, to assure their economic, politic, legal interests, as well as provision of common services.	-
Organic agriculture certification body	Certification, inspection, pre-auditing, standard and regulation services to enhance organic agriculture.	B6
Organic agriculture engineer	Individuals, developing and conserving local varieties, with function of snow-how transference, technical consultation and training, partnerships with other stakeholders for organic agriculture.	B7
Organic farming association	Representation of organic farmers to develop common guidelines and standards for agriculture and processing, as well as knowledge exchange among its members.	-
Private research institution	Generate, support and exchange scientific knowledge regarding agriculture through private funds.	-
Public research institution	Generate, support and exchange scientific knowledge regarding agriculture through public funds.	B10

The survey involves researchers and agronomist that conducted previously a field work around the sites, book authors worked on the regions, through conversations, our observations, meetings and discussions. Especially for the farmers' cooperatives and individuals, important was to have a contact, such as a person that grow up there and is working on the fields, as well as collaboration with NGOs implementing projects, e.g., on biodiversity conservation or birds nesting. The workshop held by the Agricultural University of Plovdiv brought together 16 participants representing three main groups: the first group included members of the local NGOs and ecologists, the second one comprised agricultural technicians and scientists, and the third group was formed by local farmers and residents.

ECOSYSTEM SERVICES PERCEIVED BY STAKEHOLDERS

The different types of benefits perceived by consulted stakeholders in Bulgaria listed in Table 3 are based on both workshops with regional experts and direct interviews to farmers. The results show that all the stakeholder groups identified benefits across the four categories traditionally used to classify ES. In this research work the notion of service-generating structures (SGS) (Fischer and Eastwood, 2016) refer to the physical elements that, through human intervention and often involving the transformation of ecosystems, promote ES co-production.

Table 3. Ecosystem services identified in the study areas of Bulgaria

ES class	Authorities, Technicians, Agr. experts	Ecologists & NGOs	Farmers and rural inhabitants
Cultural	Aesthetics, Agro-tourism, Heritage intangible: traditional local language (names for crops and plants), Home gardens, Local festivals, Local flora and fauna, Religious beliefs related to local plants, Traditional cultivations, Traditional grazing, Traditional knowledge, Traditional local landscapes, Traditional rural lifestyle and way of living, Traditional vineyards and wine production, Traditional water channels	Customs, Home gardens, Homemade food, Local landscape, Tourism, Traditional houses with bird nesting roofs, Traditional local food markets, Traditional knowledge	Aesthetics, Community spirit, Education, Enjoyment, Heritage, Home gardens, Inspiration, Local festivals, Local production (e.g. artefacts), Medicinal plants, Motivation, Responsibility, Spiritual enrichment, Traditional food, Traditional knowledge, Traditional landscape, Traditional poems and stories, Traditional pottery from terra cotta clay in the region
Provisioning	Food, Natural resources (e.g. land), work	Biofuel, Food, Fuel, Natural resources (e.g. land), Pollination, Raw materials, Space for living	Food, Natural resources, Work, Income
Regulating	Air purification, Biotechnology, Climate regulation, Erosion control, Landscape, Local agr. production	Air purification, Local animal diversity, Erosion control, Local climate regulation, Local environment, Soil and land conservation	Air purification, Climate regulation, Climate regulation, Erosion control, Pollination, Soil conservation, Soil fertility
Supporting	Biodiversity, Genetic diversity, Local traditional crops	Biodiversity, Habitat	Biodiversity, Genetic diversity, habitat, Local animals and crops

In agro-ecosystems, CES depend on humans, and in that way, are sustained and maintained. Features in the landscape can be also abstract notions linked to its aesthetic and sensorial characteristics.

Hanaček and Rodríguez-Labajos (2018) review the types of structures used for that purpose and their relative importance in the literature. Rural landscapes have always been shaped by agriculture-based societies creating a build and nature-based heritage, as well as (agri)cultural and semi-natural landscapes. In turn, these become a means for CES generation and often for the

provision of other types of ES. The protection and maintenance of these structures is therefore crucial for the multifunctionality of agro-ecosystems.

Different SGS can be divided in agricultural landscapes: agricultural heritage systems, mosaic elements and semi-natural landscapes, depending on local environmental conditions for example or traditions related to farming activities of a given place (Fischer and Eastwood, 2016; Hanaček and Rodríguez-Labajos, 2018).

Here we present how different stakeholders groups relate CES that these farming landscapes hold (Table 4).

Table 4. Identified links between types of service generating structures and CES in Bulgaria, per stakeholder type

SGS class	Ecologists and NGOs:	Authorities, Experts, Technicians:	Farmers
Agricultural landscapes 	1. Aesthetic, 2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 5. Co-creation of Ecological values, 6. Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 9. Education, 12. History and historical memory, 13. Inspiration, 14. Outdoor Recreation and Cultural hunting, 15. Physical, intellectual, emotional sustenance, 16. Place shaping and attachment, 17. Social interaction, 18. Spiritual enrichment, 20. Traditional agricultural practices & Small-scale farming	1. Aesthetic, 2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 4. Celebrations, 6. Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 9. Education, 11. Heritage-intangible, 16. Place shaping and attachment, 17. Social interaction, 18. Spiritual enrichment, 20. Traditional agricultural practices & Small-scale farming	1. Aesthetic, 2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 5. Co-creation of Ecological values, 6. Connectedness to nature, 7. Sense of place – belonging, 9. Education, 10. Heritage-tangible, 16. Place shaping and attachment, 17. Social interaction, 20. Traditional agricultural practices & Small-scale farming, 21. Traditional knowledge
Heritage systems 	1. Aesthetic, 2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 4. Celebrations, 5. Co-creation of Ecological values, 6. Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 9. Education, 11. Heritage-intangible, 12. History and historical memory, 13. Inspiration, 15. Physical, intellectual, emotional sustenance, 16. Place shaping and attachment, 17. Social interaction, 18. Spiritual enrichment, 19. Tourism, 20. Traditional agricultural practices & Small-scale farming, 21. Traditional knowledge	1. Aesthetic, 2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 4. Celebrations, 5. Co-creation of Ecological values, 6. Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 11. Heritage-intangible, 12. History and historical memory, 15. Physical, intellectual, emotional sustenance, 16. Place shaping and attachment, 17. Social interaction, 18. Spiritual enrichment, 19. Tourism, 20. Traditional agricultural practices & Small-scale farming, 21. Traditional knowledge	2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 4. Celebrations, 6. Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 10. Heritage-tangible, 11. Heritage-intangible, 12. History and historical memory, 13. Inspiration, 16. Place shaping and attachment, 17. Social interaction, 18. Spiritual enrichment, 19. Tourism, 20. Traditional agricultural practices & Small-scale farming, 21. Traditional knowledge
Semi-natural landscapes 	1. Aesthetic, 2. Artistic creation, 3. Traditional local varieties and breeds (Biocultural Diversity), 5. Co-creation of Ecological values, 6. Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 9. Education, 10. Heritage-tangible, 13. Inspiration, 14. Outdoor Recreation and Cultural hunting, 15. Physical, intellectual, emotional sustenance, 16. Place shaping and attachment, 17. Social interaction, 20. Traditional agricultural practices & Small-scale farming	1. Aesthetic, 2. Artistic creation, 5. Co-creation of Ecological values, 6. Connectedness to nature, 9. Education, 10. Heritage-tangible, 11. Heritage-intangible, 12. History and historical memory, 13. Inspiration, 14. Outdoor Recreation and Cultural hunting, 15. Physical, intellectual, emotional sustenance, 18. Spiritual enrichment, 20. Traditional agricultural practices & Small-scale farming	1. Aesthetic, 3. Traditional local varieties and breeds (Biocultural Diversity), 6. Connectedness to nature, 8. Cultural transmission, 10. Heritage-tangible, 14. Outdoor Recreation and Cultural hunting, 15. Physical, intellectual, emotional sustenance, 17. Social interaction
Mosaic elements 	1. Aesthetic, 2. Artistic creation, 5. Co-creation of Ecological values, Connectedness to nature, 7. Sense of place – belonging, 8. Cultural transmission, 9. Education, 12. History and historical memory, 13. Inspiration, 14. Outdoor Recreation and Cultural hunting, 15. Physical, intellectual, emotional sustenance, 16. Place shaping and attachment, 17. Social interaction, 20. Traditional agricultural practices & Small-scale farming	1. Aesthetic, 4. Celebrations, 5. Co-creation of Ecological values, 6. Connectedness to nature, 7. Sense of place – belonging, 9. Education, 11. Heritage-intangible, 17. Social interaction, 20. Traditional agricultural practices & Small-scale farming	3. Traditional local varieties and breeds (Biocultural Diversity), 5. Co-creation of Ecological values, 13. Inspiration, 14. Outdoor Recreation and Cultural hunting, 16. Place shaping and attachment, 18. Spiritual enrichment, 19. Tourism

Authorities, technicians and agricultural experts perceive more CES to each SGS in comparison with other two stakeholders groups. In general, they relate CES mostly to heritage systems. Follow agricultural landscapes in CES perception and then semi natural landscapes. The least CES perception is related to mosaic elements. Similarly, farmers relate CES mainly to heritage systems. In lower degree farmers perceive CES to agricultural landscapes, and even less to semi-natural landscapes. Mosaic elements for farmers were also the least SGS related to CES. Ecologist and NGOs relate and perceive CES less than authorities, technicians, agricultural experts and farmers. However, similar to the previous findings, ecologists and NGOs relate CES mainly to agricultural heritage systems. Follow agricultural landscapes and semi-natural landscapes. The least CES, ecologists and NGOs relate as well to mosaic elements.

CES categories were found across all four SGS. However, stakeholders connect CES in higher or lower degree depending on SGS category. Aesthetics, arts, connectedness to nature are the main CES related to SGS. Follow nature connectedness, sense of place and belonging. In lower degree CES that relate to each SGS were biocultural diversity, place shaping and place attachment, traditional small-scale farming practices. Mainly intangible heritage, spiritual enrichment and cultural transmission were, for instance importantly related to heritage systems, including social interaction and traditional knowledge. In lower degree different stakeholders relate CES, such as history and memory, tangible heritage, education and inspiration. For semi-natural landscapes the most important CES is recreation.

All four categories of ES provided by agroecosystems were found to be perceived by all three stakeholders' groups at the regional level. Cultural services are dominantly perceived by authorities, technicians and agricultural experts with 56% and farmers with 51%. Ecologist and NGO's perceived CES with 31%, in lower degree when compared to other user groups. Regulating services follow in importance ranking in similar percentage for all three groups: 22% for authorities, technicians and agricultural experts; 23% for farmers, and 27% for ecologists and NGOs. Provisioning services were mainly perceived by ecologists and NGOs (31%), while

only from 11-12% for authorities, technicians, agricultural experts and farmers. All three groups perceived supporting services from 11-14%.

CONCLUSIONS

The results show that birthplace, sense of belonging, connection with nature, aesthetic and transmission of knowledge from generation to generation are the most important cultural ecosystem services on investigated villages in Bulgaria.

Stakeholders' evaluation of CES at both regional and community levels indicate a disrupted trend of CES evaluation, in which the value of some CES increase while others decrease. In particular, at the regional level there has been an increasing trend for the CES, connectedness to nature, sense of place, history, cultural memory and intangible agricultural heritage. On the other hand, stakeholders express the decreased relevance of traditional agricultural practices and traditional knowledge (Hanacek, 2019). Our results are similar to the study of Gómez-Baggethun et al. (2010) and demonstrate that traditional agricultural practices and knowledge are critical to sustainable farming systems (Burton and Riley, 2018; Gobattoni et al., 2015).

Frequent land-use changes found in the studied communities are agricultural intensification, expansion, and monocultures.

CES have huge importance for human and society well-being.

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