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Conservation policy in traditional farming landscapes

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Abstract

Many traditional farming landscapes have high conservation value. Conservation policy in such landscapes typically follows a “preservation strategy,” most commonly by providing financial incentives for farmers to continue traditional practices. A preservation strategy can be successful in the short term, but it fails to acknowledge that traditional farming landscapes evolved as tightly coupled social–ecological systems. Traditionally, people received direct benefits from the environment, which provided a direct incentive for sustainable land use. Globalization and rural development programs increasingly alter the social subsystem in traditional farming landscapes, whereas conservation seeks to preserve the ecological subsystem. The resulting decoupling of the social–ecological system can be counteracted only in part by financial incentives, thus inherently limiting the usefulness of a preservation strategy. An alternative way to frame conservation policy in traditional farming landscapes is a “transformation strategy.” This strategy acknowledges that the past cannot be preserved, and assumes that direct links between people and nature are preferable to indirect links based on incentive payments. A transformation strategy seeks to support community-led efforts to create new, direct links with nature. Such a strategy could empower rural communities to embrace sustainable development, providing a vision for the future rather than attempting to preserve the past.

Introduction

Traditional farming landscapes provide some of the greatest remaining opportunities for biodiversity conservation. These landscapes occur in regions where farming practices have changed relatively little over long periods of time, often centuries. Examples occur all over the world, and include the Satoyama landscapes in Japan (Takeuchi 2010), the Western Ghats of India (Ranganathan *et al.* 2008), the Milpa cultivation systems in Mexico (Robson & Berkes 2011), south-western China’s terrace landscapes (Liu *et al.* 2012), agroforestry systems in sub-Saharan Africa (McNeely & Schroth 2006), and traditional village systems in parts of Eastern Europe (Palang *et al.* 2006; Hartel *et al.* 2010). Traditional farming land-

scapes often have distinctive biophysical characteristics, including substantial amounts of natural or seminatural vegetation and high heterogeneity in land cover at a fine spatial grain (Plieninger *et al.* 2006). Historically, these biophysical characteristics have been maintained through a suite of distinctive socioeconomic characteristics, namely (1) rotational land uses and mixed livestock, cropland, and forestry systems; (2) modes of resource extraction that are high in labor inputs, but low in nutrient inputs, mechanization, and pesticide application; (3) an orientation toward producing goods for subsistence or local markets; and (4) cultural traditions and norms that evolved to maintain these agroecosystem, including traditional ecological knowledge and a multitude of formal and informal institutions (Berkes *et al.* 2000).

The conservation value of traditional farming landscapes is often exceptional. Many species of natural ecosystems are able to prevail in such landscapes because their habitat remains widespread and well connected, and because land use intensity is low. In addition, some species occur in these landscapes because they have adapted over time or because their native habitat has been largely lost (e.g., European steppe birds and flora).

Many traditional farming landscapes have come under pressure from globalization. On the one hand, people gradually cease to use the landscape in the same way as in the past, for example because more convenient means of extracting value from the landscape become available (e.g., through mechanization, chemicals, more productive crops), or because agribusiness expands into traditional land use systems. On the other hand, people increasingly leave the countryside altogether, often because more appealing options of making a living become available in urban areas. A common result is abandonment of agricultural land, which may benefit natural ecosystems but comes at the expense of farmland biodiversity (MacDonald *et al.* 2000; Lambin & Meyfroidt 2011). Urbanization and increasing integration into global markets furthermore mean that people are less reliant on local ecosystem services, because locally oriented agriculture is being replaced by a culture where goods are purchased in shops. Globalization thus breaks apart the historical links between the social and ecological subsystems in traditional farming landscapes.

Notably, many inhabitants of traditional farming landscapes are financially poor, with limited access to modern technologies and opportunities. The persistence of traditional land use practices thus may not represent the free choice of farmers. From both social and economic perspectives, development therefore is desirable in many traditional farming landscapes—but threatens to undermine several key values of traditional farming landscapes. This raises at least three concerns. First, as traditional farming landscapes disappear, so do their unique biodiversity and cultural heritage. Second, many of the institutions that have governed traditional farming landscapes for centuries exhibit characteristics that are typical of long-enduring institutions governing sustainable resource use (Ostrom 1990; Anderies *et al.* 2004), whereas the sustainability of industrial agricultural systems is questionable (Tilman *et al.* 2002; Tschardtke *et al.* 2005; Perfecto & Vandermeer 2010). Third, traditional farming systems may be more resilient than industrial agriculture. This is because higher biodiversity and landscape complexity may provide a more stable supply of regulating ecosystem services, and greater adaptive capacity in the face of climate change (Bengtsson *et al.* 2003; Tschardtke *et al.* 2005).

A key challenge in traditional farming landscapes is to develop policies that foster socioeconomic development but also safeguarding biodiversity. Here, we consider how different ways of framing conservation policy could lead to fundamentally different long-term outcomes. As a case study, we focus on a traditional farming landscape that we know well, namely the Saxon region in Central Romania. However, we believe that broadly similar challenges are likely to occur in other landscapes that exhibit similar system characteristics. We first provide background information on our case study, and then discuss two contrasting ways of framing conservation policy for traditional farming landscapes. Our aim is to offer a fresh way of thinking about biodiversity conservation in traditional farming landscapes, and to stimulate further new ideas on this topic.

The Saxon region in Central Romania

The Saxon region in Central Romania is one of Europe's most notable examples of a traditional farming landscape. Saxon settlers arrived in the 12th century (Nägler 1992; Baltag 2004) and their land use practices shaped the environment for centuries after that (Dorner 1910; Oroszi 2004). As in other parts of Central and Eastern Europe, population growth during the 19th century led to an expansion of farming. During the 20th century, the Saxon region experienced major perturbations, most importantly the demise of the Austro-Hungarian Empire, the rise and fall of communism, and the accession of Romania to the European Union (EU) in 2007.

Especially the reform processes before and after communism profoundly influenced the agricultural sector. With the agrarian reform ["*reforma agrară*" (1945)] and collectivization (1949–1962) under communism, land ownership changed from private individuals to the state (Turnock 1998; Spoor 2009). Despite these changes, and unlike in other parts of Romania (Kuemmerle *et al.* 2009), intensification in the Saxon region did not go far enough to fundamentally change the character of the landscape or its biodiversity. Following the collapse of communism in 1989, much agricultural land was abandoned, and although some species may benefit from relaxing land use pressure at first, species depending on low-intensity land use are increasingly at risk. Most agricultural land and a substantial amount of forested land were restituted. The parcels of land involved were typically small, thereby effectively preventing intensification. As a result, until now, many fields are tilled by horses and people, and artificial fertilizers and other agrochemicals are scarcely applied. Hay meadows are still being used to provide fodder, and many are still cut by hand (although machinery is increasingly being used where people can afford

it). Similarly, communal pastures still exist around most villages (Akeroyd & Page 2011). In summary, although the Saxon landscape went through a series of upheavals, it has retained much of its traditional character and biodiversity.

The resulting landscape is heterogeneous, and land use follows a predictable topographic sequence (Figure 1). The valleys are occupied by villages and arable fields, and often hay meadows; the slopes are dominated by pastures; and the ridges are occupied by forest. Arable land accounts for approximately 15% of the land, pastures and meadows account for approximately 40%, and deciduous forest accounts for approximately 30%. Settlements and other minor land uses account for the remainder. Seminal vegetation occurs throughout the landscape, and includes grassland, hedgerows, streamside vegetation, and scattered trees.

The continuation of traditional agricultural practices has led to the survival of many species that have disappeared from or are in sharp decline elsewhere in Europe. Meadows and pastures are second to none in Europe in their diversity of wildflowers (Kim Wilkie Associates 2001; Akeroyd & Page 2007), and amphibians that have declined in Western Europe (e.g., yellow-bellied toad *Bombina variegata*; tree frog *Hyla arborea*; great crested newt *Triturus cristatus*) are still common (Hartel *et al.* 2010). Many species that depend on large tracts of intact forest (Mikusinski & Angelstam 1998; Jedrzejewski *et al.* 2004) have also persisted, including several woodpecker species, the European brown bear (*Ursus arctos*), and the wolf (*Canis lupus*; Kim Wilkie Associates 2001). In recognition of its extraordinarily high biodiversity, an area of approximately 270,000 ha was delineated as a Natura 2000 site.

It is critically important to reflect on the linkages between nature and people in traditional farming landscapes such as Romania's Saxon region. Historically, such landscapes have been tightly coupled social-ecological systems (Figure 2). People shaped the land through their activities; and the land, in turn, gave people a variety of ecosystem services (Dorner 1910). These have included provisioning services (in the case of the Saxon area, crops, hay, timber, firewood, honey, and fresh water, to name only a few), regulating and supporting services, and also a cultural identity that is grounded in the landscape.

From a socioeconomic perspective, the Saxon region now faces serious challenges. Traditional subsistence agriculture is economically unprofitable, leading to the abandonment of farmland on the one hand, or its intensification on the other. The number of cows, and with it the number of cow pastures and hay meadows, has sharply declined in many villages. Many villages lack access to medical care and education, and access to information

via sources such as the Internet or public libraries is very limited. Poverty already was a problem in the Saxon region during the communist era, but economic hardship has further increased after the revolution, with unemployment rising as a result of state farms and factories in nearby towns closing. Widespread corruption has eroded trust in local authorities and official community leaders or government representatives. Negative "outside" influences are further exacerbated by problems within local communities. Social inequality and conflicts between different ethnic groups (now primarily Romanians, Hungarians, and Roma) are increasing, and social cohesion is weak. These social problems further undermine the attractiveness of continuing traditional land use practices (T. Hartel, unpublished data gathered in a series of interviews in 2011).

Framing conservation policy: two contrasting options

From a conservation policy perspective, a key objective typically is to maintain the biodiversity value of traditional farming landscapes. For example, much "High Nature Value" farmland in Europe is linked to traditional, low-intensity farming practices (Paracchini *et al.* 2008; Akeroyd & Page 2011). But is it possible, realistic, and desirable to strictly maintain past land use practices? Or might different practices also conserve biodiversity, as long as they follow similar principles (e.g., low nutrient inputs, high landscape heterogeneity)? How should policy be framed to be most successful in achieving enduring conservation outcomes?

Much existing debate on policy approaches, especially in the EU, implicitly assumes a "preservation strategy," which seeks to maintain traditional practices by making them financially attractive, for example through agri-environment payments. The idea behind this strategy is simple: if people can be paid to continue specific practices known to benefit biodiversity, they will be much more likely to adopt these practices. In the EU, the preservation strategy is implemented through the Common Agricultural Policy (CAP), via the (partial) redirection of subsidies for commodity production to payments for environmentally benign practices. The use of a preservation strategy per se is largely unquestioned in the EU. Rather, debates to date have focused largely on which specific farming practices payments should be linked to, and how their effectiveness to conserve biodiversity should be monitored (Kleijn & Sutherland 2003; Donald *et al.* 2007; Kleijn *et al.* 2009; European Commission for Agriculture and Rural Development 2010a).

Although a preservation strategy is widely assumed to be the best policy option, we argue that conservation



Figure 1 A traditional agricultural landscape in the Saxon area of Romania. The image shows high heterogeneity in land cover, with a predictable geographic sequence. Arable land is located in the valleys; pastures occur on the slopes; and forests occupy the ridges. The region harbors a variety of species that are threatened in other parts of Europe.

policy in traditional farming landscapes should be framed differently. An overly strong emphasis on financial payments targeting specific farming practices is a simplistic conceptual model for policy development in traditional social–ecological systems, because it ignores the two-way linkages between people and nature, which traditionally characterized the system (Figure 2). Traditionally, people received direct feedback from the environment—if the environment was managed well, resources were available reliably, year after year. This is not to say that unsustainable resource use did not occur in the past (Diamond 2005) or that land use practices in traditional farming landscapes are always environmentally friendly. Yet, where direct links between nature and society have evolved over long periods of time, people have a clear inherent incentive to maintain the environment and its associated goods and services. Financial incentives, by contrast, provide no inherent incentive. They are attractive only in a monetary sense, and a logical consequence is that if the external payments were to stop for some rea-

son, so would the land use practices that are artificially maintained via those payments.

We propose an alternative way to frame conservation policy, which we term the “transformation strategy” (Figure 2). This model assumes that (1) the ecosystems resulting from traditional agricultural use are worth maintaining in their basic structure and function, although (2) changes in the social system are inevitable and often desirable. Globalization has now reached many traditional farming landscapes which were relatively isolated until fairly recently, in Europe but also in Africa, Asia, and Latin America (Grau & Aide 2008; Perfecto & Vandermeer 2010). Some of the resulting social changes include cultural and demographic shifts, economic development, a decline in subsistence agriculture, and a general breakdown of the traditional institutions governing land use—often with negative consequences for social cohesion and social equality. Framed from a social–ecological perspective, these changes represent a decoupling between ecosystems and social systems.

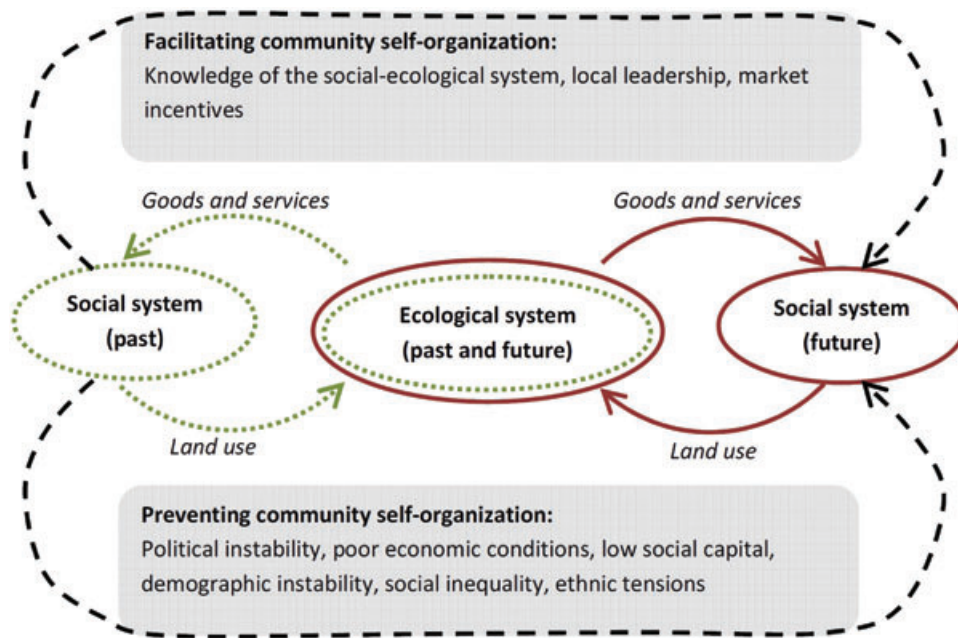


Figure 2 Social–ecological transformation in traditional farming landscapes. Because traditional farming has maintained high biodiversity, the ecological subsystem (center) in traditional farming landscapes is often deemed worthy of conservation. By contrast, the social subsystem of the past (left) is inevitably changing, leading to a decoupling of the social and ecological subsystems. Conservation policy should support a process of community-led transformation, with the goal of recoupling the ecological

subsystem with a new social subsystem (right). Like the old social subsystem, the new social subsystem will be tightly coupled with the ecological subsystem to provide direct incentives for biodiversity conservation and sustainable resource management. Policy measures should reduce pressures from variables that stand in the way of self-organization in the social–ecological system (bottom), and should foster variables that facilitate self-organization (top; see also Anderies *et al.* 2004; Ostrom 2009).

The transformation strategy we propose is based on the premise that strong linkages between nature and society are essential for the effective conservation of traditional farming landscapes. Unlike the preservation strategy, the transformation strategy does not aim to preserve past linkages, but rather seeks to facilitate meaningful recoupling of the ecosystem with a new kind of social system. For a new, enduring social–ecological system to emerge after transformation it is important to encourage an appropriate “land use” link from the social to the ecological subsystem, but also to reinstate an “ecosystem services” link from the ecological subsystem to the social system (Figure 2). We thus propose that other things being equal, if people derive direct benefits from farmland ecosystems, they will be more likely to manage those systems sustainably. The preservation strategy, which is the dominant conservation paradigm at present, recognizes only the land use link, but not the ecosystem services link between people and nature—it therefore does not ascribe any particular importance to managing the social–ecological system as a whole.

An alternative vision for conservation policy in traditional farming landscapes thus is one of active transfor-

mation. Such a process would encourage and assist local people in finding ways to (once again) derive direct benefits from nature. Rather than attempting to preserve the past, policies would empower local communities to self-organize and reconnect with nature in new ways, thereby assisting an active process of (community-led) social transformation. Examples of community-based approaches to manage social–ecological systems sustainably in the face of rapid societal change exist, including the *ejido* community land management principles in Mexico (Bray *et al.* 2003), community forest institutions in Nepal (Nagendra *et al.* 2008), and decentralized natural resource management in India and Latin America (Larson & Soto 2008).

Importantly, policy measures to instigate a transformation approach need not necessarily be directed at individual farmers but may be best delivered through community or nongovernment organizations. This is especially the case in areas where the education level of individual farmers is low, or where the amount of land owned by individual farmers is so small that subsidy payments to individuals are not workable. Under such conditions, an overly narrow focus on subsidies to individual farmers

may cause a widening socioeconomic gap between the wealthy and the poor, and will do little for the development of social and economic sustainability at the community level.

Given our emphasis on community involvement, the transformation strategy we propose has parallels with community-based natural resource management (CBNRM). However, the two are not synonymous. Like our transformation strategy, CBNRM assumes that local people are well placed to manage natural resources. However, we do not claim that empowering locals *per se* will lead to sustainable resource management—an assumption that has often been implicit to CBNRM, which in turn, has been much debated and criticized because of its inconsistent effectiveness (Berkes 2004; Thakadu 2005; Blaikie 2006). Unlike in CBNRM, our central argument is that an ultimate goal of conservation policy in traditional farming landscapes should be to help reconnect people with nature. Although this will not be possible without involving local communities, we do not see community involvement (or empowerment) as a likely solution in its own right. Rather, we argue that there is a need for policy programs (e.g., incentive payments, outreach programs, education initiatives) that specifically support communities to forge meaningful new links with nature. Our proposed transformation strategy thus also has parallels with the discourse on the authenticity of cultural landscapes. Authenticity in this discourse relates both to the specific (typically traditional) ways in which people use the landscape, but importantly, it also relates to their being a genuine connection between people and their environment (Gustavsson & Peterson 2003). The presence of a genuine connection (rather than traditional practices), in turn, is the main focus of our proposed transformation strategy.

Policy implications: from theory to practice

Having reframed the challenge of devising conservation policies in a way that recognizes the interlinked nature of people and their environment, the key question is what can be done to operationalize this approach. Two policy ingredients are important in this context. The first ingredient relates to identifying which new links with the environment are possible and desirable. The second relates to creating a supportive environment in which communities can actively work toward establishing those new links.

Traditional farming landscapes are predisposed to a number of potential new links that can help to maintain biodiversity, although the details will depend on the specific region. For example, policy measures might help communities to receive certification for organic practices already in place, develop markets for organic prod-

ucts or regional specialty products, or develop an ecotourism industry—ultimately helping communities to develop new institutions and a new sense of identity, in which nature continues to play an important role. The key is to find ways of using the land that are deemed worthwhile by local communities, while also maintaining farmland biodiversity. In the Saxon region, some nongovernment organizations have started practical initiatives to this end, with clearly apparent benefits for sustainable development at the local level (ADEPT Foundation 2011; Akeroyd & Page 2011; Mihai Eminescu Trust 2011). For example, the ADEPT Foundation supports farmers to maintain low-intensity agricultural practices by developing markets for traditional food products, and by supporting milk collection centers. Similarly, the “Whole Village Project” run by the Mihai Eminescu Trust offers assistance to local communities to restore traditional buildings and devise development plans that are compatible with the maintenance of natural and cultural heritage. Interviews and focus group exercises carried out in the Saxon landscapes suggest that people from villages with a strong presence of actors such as the ADEPT Foundation or the Mihai Eminescu Trust are typically more optimistic regarding various facets of sustainable development than people from villages without a strong presence of such actors. Moreover, ethnic tensions and social conflicts also appear to be reduced in such communities (T. Hartel, unpublished data gathered in a series of interviews in 2011).

Substantial knowledge exists on which variables are related to the ability of communities to self-organize. Key variables include the prevalence of collective-choice rules, local leadership, existing norms, social capital, adaptability of decision making, and knowledge of the social–ecological system. At the same time, some conditions are harmful to self-organization, including external circumstances such as political instability, poverty, and a culture of mistrust (Anderies *et al.* 2004; Ostrom 2009), but also local factors such as pronounced social inequalities or ethnic tensions. To maximize the chances of forging new links between people and nature, policies should try to increase the strength of variables that support self-organization, while working to stabilize or control variables with known negative effects (Figure 2).

In many countries with turbulent political histories, the role of the state and a history of corruption are critically important. In Romania, for example, a small number of influential people have often exploited the hope of local communities for greater prosperity (Verdery 1995). Similarly, until today, the media have failed to establish themselves as an independent institution and remain tightly controlled by various political interest groups

(Gross 2008). The result is a high level of mistrust in government authorities. Nevertheless, we have witnessed in some villages of the Saxon area how diverse and pluralistic local leadership (*sensu* Goodman *et al.* 1998) can partly counteract the negative influence of an unstable political environment.

Our framing of conservation policy in traditional farming landscapes has important implications for our case study area and other parts of Eastern Europe. A range of Central and Eastern European (CEE) countries have recently joined the EU, and traditional farming landscapes have survived to a far greater extent in CEE countries than in Western Europe. As a result, farmland biodiversity in CEE countries has not declined to the same extent as in Western Europe, as exemplified by pan-European studies on birds (Donald *et al.* 2001) and local evidence on numerous other taxonomic groups (e.g., Akeroyd 2007; Schmitt & Rakosy 2007; Hartel *et al.* 2010).

Traditional farming landscapes in CEE countries are now at a crossroads. Global change has arrived in these landscapes, and they have become subject to market forces and a complex set of EU policies on agriculture and the environment. Most importantly in this context is the upcoming reform of the EU's CAP, which is due in 2013 and already has sparked great interest among the general public, stakeholders, and researchers (European Commission for Agriculture and Rural Development 2010b). Reform options range from minor changes to the current structure of incentive payments, to a fundamental reorientation toward sustainability, including farmland biodiversity conservation (European Commission for Agriculture and Rural Development 2010a). With few exceptions, debate on the CAP reform has been dominated by considerations about who ought to receive subsidies for which kinds of farming practices. To date, we are aware of virtually no input into the CAP debate that explicitly recognizes the importance of strong, two-way linkages between nature and people—which in turn, we consider a fundamental prerequisite for recreating inherently sustainable land use systems.

Financial payments to individuals have a place in conservation policies because they help to provide a favorable economic environment. However, relying solely on agri-environment-type payments is unlikely to maintain genuine (or “authentic”; see Gustavsson & Peterson 2003) links between communities and nature. A substantial part of available resources therefore should foster initiatives that aim to reestablish genuine links between people and nature. In practice, this may mean supporting bridging organizations or ecotourism providers; or public campaigns geared at helping communities redefine their identities and links with nature. Narrowly focused incentives to maintain practices of the past fail to acknowledge

the importance of deep and coevolved linkages between people and nature, and therefore may further reinforce a decoupling of social and ecological subsystems in traditional farming landscapes. Acknowledging existing links between people and nature, while actively creating new links, should be a central goal of conservation policies in traditional farming landscapes.

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References

- ADEPT Foundation. (2011) Adept and local products. http://www.fundatia-adept.org/?content=local_products (visited July 19, 2011).
- Akeroyd, J. (2007) *The historic countryside of the Saxon villages of Southeast Transylvania*. Fundația ADEPT, Saschiz, Mureș, Romania.
- Akeroyd, J.R., Page, J.N. (2011) Conservation of High Nature Value (HNV) grassland in a farmed landscape in Transylvania, Romania. *Contributii Botanice* **XLVI**, 57–71.
- Akeroyd, J.R., Page, N. (2007) The Saxon villages of southern Transylvania: conserving biodiversity in a historic landscape. Pages 199–210 in D. Gafta, J. Akeroyd, editors. *Nature conservation: concepts and practice*. Springer, New York.
- Anderies, J.M., Janssen, M.A., Ostrom, E. (2004) A framework to analyze the robustness of social–ecological systems from an institutional perspective. *Ecol Soc* **9**, 18. Available from: <http://www.ecologyandsociety.org/vol9/iss1/art18>, Accessed 27 February, 2012.
- Baltag, G. (2004) *Sighisoara, Schässburg, Segesvár*. Editura Nereamia Napocae, Cluj Napoca (in Romanian).
- Bengtsson, J., Angelstam, P., Elmqvist, T. *et al.* (2003) Reserves, resilience and dynamic landscapes. *Ambio* **32**, 389–396.
- Berkes, F. (2004) Rethinking community-based conservation. *Conserv Biol* **18**, 621–630.
- Berkes, F., Colding, J., Folke, C. (2000) Rediscovery of traditional ecological knowledge as adaptive management. *Ecol Appl* **10**, 1251–1262.

- Blaikie, P. (2006) Is small really beautiful? Community-based natural resource management in Malawi and Botswana. *World Devel* **34**, 1942–1957.
- Bray, D.B., Merino-Pérez, L., Negreros-Castillo, P., Segura-Warnholtz, G., Torres-Rojo, J.M., Vester, H.F.M. (2003) Mexico's community-managed forests as a global model for sustainable landscapes. *Conserv Biol* **17**, 672–677.
- Diamond, J. (2005) *Collapse: how societies choose to fail or succeed*. Viking Press, New York.
- Donald, P.F., Green, R.E., Heath, M.F. (2001) Agricultural intensification and the collapse of Europe's farmland bird populations. *Proc Royal Soc B: Biol Sci* **268**, 25–29.
- Donald, P.F., Sanderson, F.J., Burfield, I.J., Bierman, S.M., Gregory, R.D., Waliczky, Z. (2007) International conservation policy delivers benefits for birds in Europe. *Science* **317**, 810–813.
- Dorner, B. (1910) *The agriculture of Transylvanian Saxons*, Győr (in Hungarian).
- European Commission for Agriculture and Rural Development. (2010a) *The CAP towards 2020: meeting the food, natural resources and territorial challenges of the future. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. 18 November 2010*. European Union, Brussels.
- European Commission for Agriculture and Rural Development. (2010b) *The Common Agricultural Policy after 2013: public debate summary report*. European Union, Brussels.
- Goodman, R.M., Speers, M.A., McLeroy, K. *et al.* (1998) Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Educ Behav* **25**, 258–278.
- Grau, H.R., Aide, M. (2008) Globalization and land-use transitions in Latin America. *Ecol Soc* **13**(2), 16. [online] Available from: <http://www.ecologyandsociety.org/vol13/iss2/art16/> Accessed 27 February, 2012.
- Gross, P. (2008) Forward to the past: the intractable problems of Romania's media system. *Int J Press/Politics* **13**, 141–152.
- Gustavsson, R., Peterson, A. (2003) Authenticity in landscape conservation and management—the importance of the local context. Pages 319–356 in H. Palang, G. Fry, editors. *Landscape interfaces*. Kluwer Academic Publishers, Dordrecht, Boston, and London.
- Hartel, T., Schweiger, O., Ollerer, K., Cogalniceanu, D., Arntzen, J.W. (2010) Amphibian distribution in a traditionally managed rural landscape of Eastern Europe: probing the effect of landscape composition. *Biol Conserv* **143**, 1118–1124.
- Jedrzejewski, W., Niedzialkowska, M., Nowak, S., Jedrzejewska, B. (2004) Habitat variables associated with wolf (*Canis lupus*) distribution and abundance in northern Poland. *Diversity Distrib* **10**, 225–233.
- Kim Wilkie Associates. (2001) *The Saxon villages of Transylvania, Romania: a future for the mediaeval landscape*. Report to the HRH The Prince of Wales and the Mihai Eminescu Trust, United Kingdom.
- Kleijn, D., Kohler, F., Baldi, A. *et al.* (2009) On the relationship between farmland biodiversity and land-use intensity in Europe. *Proc Royal Soc B: Biol Sci* **276**, 903–909.
- Kleijn, D., Sutherland, W.J. (2003) How effective are European agri-environment schemes in conserving and promoting biodiversity? *J Appl Ecol* **40**, 947–969.
- Kuemmerle, T., Müller, M., Rusu, M., Griffiths, P. (2009) Land use change in southern Romania after the collapse of socialism. *Reg Environ Change* **9**, 1–12.
- Lambin, E.F., Meyfroidt, P. (2011) Global land use change, economic globalization, and the looming land scarcity. *Proc Natl Acad Sci* **108**, 3465–3472.
- Larson, A.M., Soto, F. (2008) Decentralization of natural resource governance regimes. *Ann Rev Environ Resour* **33**, 213–239.
- Liu, Y., Duan, M., Yu, Z. (2012) Agricultural landscapes and biodiversity in China. *Agric Ecosyst Environ* In Press. doi:10.1016/j.agee.2011.05.009
- MacDonald, D., Crabtree, J.R., Wiesinger, G. *et al.* (2000) Agricultural abandonment in mountain areas of Europe: environmental consequences and policy response. *J Environ Manage* **59**, 47–69.
- McNeely, J., Schroth, G. (2006) Agroforestry and biodiversity conservation—traditional practices, present dynamics, and lessons for the future. *Biodivers Conserv* **15**, 549–554.
- Mihai Eminescu Trust. (2011) *Whole villages projects*. http://www.mihaieminescutrust.org/content/nd_village.asp?n=91 (visited July 19, 2011).
- Mikusinski, G., Angelstam, P. (1998) Economic geography, forest distribution, and woodpecker diversity in central Europe. *Conserv Biol* **12**, 200–208.
- Nagendra, H., Pareeth, S., Sharma, B., Schweik, C.M., Adhikari, K.R. (2008) Forest fragmentation and regrowth in an institutional mosaic of community, government and private ownership in Nepal. *Landsc Ecol* **23**, 41–54.
- Nägler, T. (1992) *The arrival of the Saxons in Transylvania (in Romanian)*. Kriterion, Bucharest.
- Oroszi, S. (2004) *The forest management of Transylvanian Saxons, Budapest*. Erdészeti Egyesület, Erdészettörténeti Szakosztály, Budapest (in Hungarian).
- Ostrom, E. (1990) *Governing the commons: the evolution of institutions for collective action*. Cambridge University Press, Cambridge.
- Ostrom, E. (2009) A general framework for analyzing sustainability of social-ecological systems. *Science* **325**, 419–422.
- Palang, H., Printsman, A., Gyuro, E.K., Urbanc, M., Skowronek, E., Woloszyn, W. (2006) The forgotten rural landscapes of Central and Eastern Europe. *Landsc Ecol* **21**, 347–357.
- Paracchini, M.L., Petersen, J.-E., Hoogeveen, Y., Bamps, C., Burfield, I., Swaay, C.v. (2008) *High Nature Value farmland in Europe—an estimate of the distribution patterns on the basis of*

- land cover and biodiversity data, Report EUR 23480 EN.* European Commission, Luxembourg, http://agrienv.jrc.ec.europa.eu/activities_HNV.htm Accessed 27 February, 2012.
- Perfecto, I., Vandermeer, J. (2010) The agroecological matrix as alternative to the land-sparing/agriculture intensification model. *Proc Natl Acad Sci* **107**, 5786–5791.
- Plieninger, T., Hoehchl, F., Spek, T. (2006) Traditional land-use and nature conservation in European rural landscapes. *Environ Sci Policy* **9**, 317–321.
- Ranganathan, J., Daniels, R.J.R., Chandran, M.D.S., Ehrlich, P.R., Daily, G.C. (2008) Sustaining biodiversity in ancient tropical countryside. *Proc Natl Acad Sci USA* **105**, 17852–17854.
- Robson, J.P., Berkes, F. (2011) Exploring some of the myths of land use change: can rural to urban migration drive declines in biodiversity? *Glob Environ Change* **21**, 844–854.
- Schmitt, T., Rakosy, L. (2007) Changes of traditional agrarian landscapes and their conservation implications: a case study of butterflies in Romania. *Diversity Distrib* **13**, 855–862.
- Spoor, M., editor. (2009) *The political economy of rural livelihoods in transition economies*. Routledge, London and New York.
- Takeuchi, K. (2010) Rebuilding the relationship between people and nature: the Satoyama initiative. *Ecol Res* **25**, 891–897.
- Thakadu, O.T. (2005) Success factors in community based natural resources management in northern Botswana: lessons from practice. *Nat Resour Forum* **29**, 199–212.
- Tilman, D., Cassman, K.G., Matson, P.A., Naylor, R., Polasky, S. (2002) Agricultural sustainability and intensive production practices. *Nature* **418**, 671–677.
- Tscharntke, T., Klein, A.M., Kruess, A., Steffan-Dewenter, I., Thies, C. (2005) Landscape perspectives on agricultural intensification and biodiversity—ecosystem service management. *Ecol Lett* **8**, 857–874.
- Turnock, D. (1998) Romania. Pages 200–250 in D. Turnock, editor. *Privatization in rural Eastern Europe the process of restitution and restructuring*. Edward Elgar, Cheltenham.
- Verdery, K. (1995) Faith, hope, and cantos in the land of the Pyramids, Romania 1990–1994. *Comparative Stud Soc Hist* **37**, 625–669.