INSTITUTIONAL OPTIONS FOR THE CONSERVATION OF BIODIVERSITY: EVIDENCE FROM THE CZECH REPUBLIC

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ABSTRACT

The paper focuses on changes in property rights and policies regarding interactions between agriculture and nature in the Czech Republic. In the first part the recent situation is reviewed. The institutional and organisational features and their development during the transition and recent years are illustrated by the case study on the White Carpathian protected landscape area. The key issue in conservation in the White Carpathians (as in the number of other marginal areas) is to maintain grassland management at large scale. While environmental policy lacks measures for maintaining grassland management, respective incentives were launched in the frame of agricultural policy, although they do not sufficiently consider environmental concerns. There are two other problem areas hampering efficient organisation of conservation: uncompleted land reform and little involvement of local population in determining conservation priorities. In the second part, the paper examines three policy options for enhancing sustainability of landscape and biodiversity on farmland. The proposed policy options each reflect the identified problems in the White Carpathian case study.

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ABBREVIATIONS

AA	Agricultural Agency of the Ministry of Agriculture
CEEC	Central and Eastern European Countries
CSOP	Czech Union for Nature Protection
ICMK	Information Centre of Moravske Kopanice (NGO)
LA PLA	Local Administration of the Protected Landscape Area
MoA	Ministry of Agriculture
MoE	Ministry of Environment
MP PLA	Management Plan of the Protected Landscape Area
PLA	Protected Landscape Area

1. Introduction

The paper refers to sustainable land management in marginal areas. These areas are often protected for its landscape and biodiversity values. Much of the land has poor soils and the areas tend to be underdeveloped. Historically, low-intensity farming was practised maintaining the richness of the wildlife and the diversity of the landscape. Collectivisation in the 1950s and the subsequent intensification of agriculture threatened the area's natural values. In order to curb some of these adverse effects Protected Landscape Areas (PLA) were designated in 1970s and 1980s.

The political change in 1989 and the following economic reforms led to both a sharp economic decline and major structural adjustments in agriculture. Whilst, on the one hand, these have resulted in reduced pressures on the natural environment, they have, on the other hand, led to the extensive withdrawal of land management practices that had been essential to the maintenance of landscape and biodiversity. The available nature protection policy measures and approaches, however, were not appropriate to these new threats, being rather blunt controls over the intensity of production.

In 1997, new agricultural legislation and policy were introduced which recognised the need for compensation for restrictions on agricultural practices and provided a basis for the gradual introduction of incentives to cultivate marginal land. However, this policy has not been integrated with the governance of environmental protection. The obstacles to the long-term sustainability of land management in the Czech Republic and policy options to deal with them are illustrated by the White Carpathian Protected Landscape Area case study. We identified two other principal institutional imperfections in land management in the White Carpathians: Division and uncertainty surrounding property rights to the land and the limited involvement of local people in determining how areas should be managed and developed.

Cultural landscapes and biodiversity on farmland even in protected landscape areas are outcomes of human interactions with nature. Thus their state will always depend on the values and priorities of current local, national and global populations and the mechanisms by which the priorities are transmitted to agents providing environmental qualities. The central question of this paper rests in options to improve institutions, particularly arrangements in order to get more environmental values on a sustainable basis.

This paper proceeds as follows: First, we introduce a theoretical concept. Then, we explain how the provision of environmental goods was organised in the case study area - the White Carpathians - and make general conclusions. The final section defines and examines policy options for institutional change enhancing sustainability of the organisation of the provision of landscape and biodiversity on farmland

2. Theoretical concepts

Our attention is paid to three goods (assets) – land, agricultural products (conventional or ecological), and landscape and biodiversity. Property rights over these goods have changed during the last decade. Land reforms (Land Law, 229/91) returned titles to land to original (pre-1948) owners and their heirs in 1992-1993. Ratinger and Rabinowicz (1997) listed outstanding problems with delineation of property rights to land. Among them, uncertain subdivision of property due to inheritance and the prevalence of unidentified/inactive owners have been the most pertinent problems regarding landscape

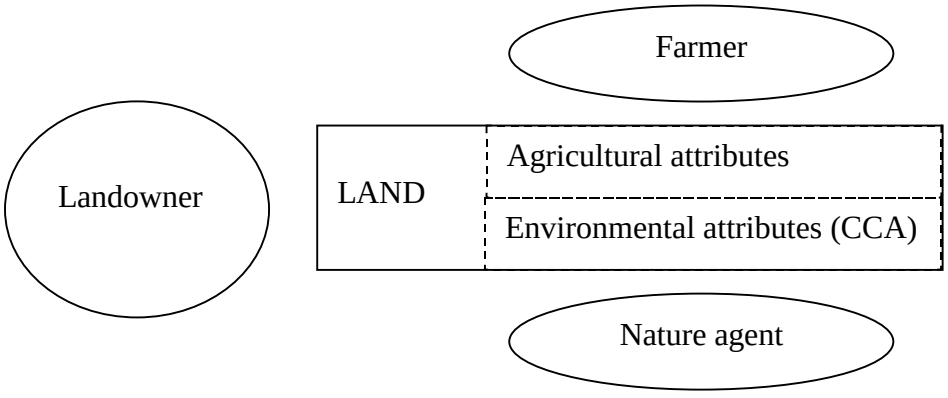
and biodiversity management. The steady depopulation of the marginal regions over a long period of time has exacerbated these problems. The heirs of the original owners may now live far away, may be unaware of their property or may have such a small or uncertain stake as to provide insufficient incentive to them to pursue their claims.

In the effect of market liberalisation and commercial reforms, farmers (as all other entrepreneurs) acquired economic property rights over their "food & fibre" output. Since that, farmers' incomes have depended on selling their products instead of discretion of central planners.

Landscape and biodiversity are another outputs of the land. For reasons that will become apparent later we divide environmental output "landscape and biodiversity" into four categories: Landscape (as composition of meadows, pastures and arable land, its tillage etc.), landscape amenities (hedges, trees, (traditional rural) buildings etc.), biodiversity (diversity of species on a large area) and micro habitat protection (nature reserves). We deal with non-rival and (partly) non-excludable goods (Slangen 2001, 2002), especially if we consider their intrinsic values.

Lippert (2002) suggests associating the bundle of capabilities (to provide food and fibre and to provide environmental qualities) to land and distinguishing between agricultural and environmental attributes of land ownership. Bromley and Hodge (1990) use a broader term 'countryside and community attributes' (CCA) to a bundle of non-food & fibre attributes associated with land. Obviously, these attributes will not necessarily be controlled by one and the same person. The fact that different agents may optimise agricultural and environmental attributes (CAA) may lead to 'divided ownership'. While property rights to agricultural attributes are supposed to be held by farmers, environmental attributes may finally be in hands of a non-farming person or organisation, e.g. a 'nature agent' (for illustration see Figure 1).

Figure 1 Lippert's scheme



Source: own illustration

The question is which institutional arrangement (governance structure) ensures the optimal provision of environmental qualities. The arrangement will depend on transaction costs (here: costs of enforcing property rights) arising with provision and transfer of environmental attributes. Lippert (2002) distinguishes three kinds of transaction costs: costs of excluding, cost of measuring the benefit, costs of monitoring inputs. If the sum of production costs (inc. opportunity costs) and costs of excluding is below the value of an environmental quality, the market will sooner or later provide for remuneration of the

providers' effort. If costs of excluding are prohibitive while production costs are less than the (social) value of the environmental attribute, a territorial authority may promote its provision. Then the remuneration modality will depend on costs of output measuring (Lippert, 2002):

(a) If these costs are low (justifiable high) a result-related remuneration of the person or organisation improving the environment will be preferable.
(b) If costs of measuring are prohibitive an action-related remuneration will be preferable. Since the output is not measurable (at acceptable costs), the measure must rely on such (farming) practices, which are supposed to produce desired environmental effects.

Falconer (2002) pays particular attention to transaction characteristics as assets specificity, observability and inseparability in the context of farmers' participation in voluntary schemes for provision of landscape and biodiversity. In the theory of Williamson (1991), assets specificity refers to the fixed costs related to a transaction or better to the low opportunity costs that assets have for an alternative use (Vernimmen et al., 2000). These fixed costs may relate to the particularity of site, long-term investment or knowledge. Low separability (high inseparability) is often due to joint production of environmental goods provided by agents. Joint production (by a number of agents) might be associated with low observability of individual contributions and, hence, high costs of measuring them. This we have already considered. Beyond this, there are often joint productions, for which inputs by individuals are rather complements than substitutes. Consider the production of landscape, if one land operator refuses to provide/maintain certain landscape features (attributes) extra landscape management activity of another land operator will not compensate (Falconer, 2002). Following Williamson (1985) we can distinguish four types of contract-cooperation modalities: spot market, obligational market, primitive team and relational team (Table 1).

Table 1 Governance structure in respect to separability and assets specificity

	Low assets specificity	**High assets specificity**
Separabilty	*Spot market*: short-term contracts and highly individualised incentives (high observability)	*Obligational market:* contracts of longer duration likely, easy implementation
Inseparability	*Primitive team:* problems in identifying individual contribution to overall performance. Contracts are more complex than the spot market, with more costly monitoring required. Longer duration contracts (given the costs of re-negotiation), but still relatively short term as low specificity.	*Relational team:* complex organisation; tendency to opportunism- cooperation, need of shared values. Long-term contracts to capitalise on the costs of building team capacities with a greater role of organisational incentives over monetary incentives.

Source: Falconer, 2002

Slangen (2002) following Lyons and Mentha (1997) is more precise and distinguishes between contracts (terms under which property rights are modified/exchanged) and arrangements (under which contracts are implemented). Three types of contracts are suggested: classical, neo-classical and relational. In classical contracts, the identity of parties does not matter, price is the most important co-ordination mechanism, safeguards are of little importance and term is short. The relational contract is quite the opposite. The identity and personal characteristics of parties in the relational contract are crucial,

price is of minor importance as co-ordination mechanism, safeguards are very important and the term is very long. In between there are neo-classical contracts, in which the identity of parties matters, price is less important than co-ordination mechanism, safeguards are important and term of contract is longer. Obviously, contracts and governance structures are closely related. Intuitively, classical contracts relate to spot markets (from Table 1), relational contracts to relational teams (which may take a form of environmental cooperative) and neo-classical contracts to primitive teams or obligational markets. Actually, transaction characteristics determine both features of contracts and features of governance structures. The above discussion is summarised in Table 2. As Menard (1997) pointed out, the best contract is a contract that can be set up and implemented under low costs, with simple enforcement procedure. Therefore, the choice (or evolution) of the governance structure will depend, besides the above-discussed transaction characteristics, on the completeness and complexity of contracts (Slangen, 2002). Incompleteness results from bounded rationality, particularly if the environment is uncertain and from opportunistic behaviour of the partners. Complexity has to do with writing of and implementation of contracts mainly as a result of an unclear distribution of residual control rights between parties.

According to Barzel (1997), the attribute, like biodiversity or landscape, is an impure public good or a common good, i.e. it is under public domain. Therefore, we have to deal with complex contracts. The contract might be settled as if all possible events are foreseen, i.e. as complete contract; the corresponding governance solution will be the (principal) agent model. In practice, it will be difficult to take all contingencies into account, hence, contracts for landscape and biodiversity tend to be incomplete. In this case, the arrangement will depend mainly on the importance of horizontal co-ordination.

Table 2 Transaction characteristics and organisation

Transaction characteristics	**Features of contracts/organisation when transaction costs tend to be high**
Excludability	non-market governance structures
Assets specificity	need for long-term contracts
Measurability (observability) of output	action-related contracts
Monitoring	commitment and trust needed, securities important
Inseparability (low separability)	horizontal coordination important

Source: own classification

For those attributes/environmental qualities for which horizontal coordination is essential, the relational contracts and relational teams (e.g. environmental cooperatives) are proper arrangements. For the others it can be hybrid forms based on neo-classical contracts. When result-related measures are justifiable and when specialisation and scale effects can be expected, the introduction of a ‘nature agent’ (e.g. Conservation, Recreation and Amenity trusts, (Hodge, 1991)) can be considered, who has to be the ‘residual claimant’ to the outcome of his effort (Lippert, 2002). Now, the question arises how the discussed transaction characteristics, contracts and governance structures relate to various environmental goods/services from the family of landscape and biodiversity. We might get a notion of the linkage between goods and transaction characteristics from Lippert (2002) and Falconer (2002) (Table 3).

Table 3 Transaction characteristics of environmental services - "landscape and biodiversity"

	Cost of exclusion	**Assets specificity**	**Measurement cost (observability in the reciprocal way)**	**Inseparability (jointness in inputs)**
Landscape maintenance	High, prohibitive	Tends to be high	High	High
Maintenance of **landscape amenities** (hedges, trees, etc.)	High	Rather low	Low	Low
Biodiversity protection	High, prohibitive	High	High (attempts made)	High
Micro habitat protection	High	High	Rather low (definitely possible)	Low

Source: Lippert, 2002, Falconer 2002

This allows us to build an image of "optimal" governance structures for landscape and biodiversity provision. It is obvious that due to high costs of exclusion we have to deal with non-market arrangements. Assets specificity tends to be high for the family of landscape and biodiversity goods, claiming long-term contracts. Due to high inseparability, landscape and biodiversity will require significant horizontal coordination. Results and individual contributions in protecting microhabitat or providing certain landscape amenities are observable and measurable. Therefore, governance might be result-oriented and relatively simple. Lippert (2002) suggests that landscape amenities and microhabitat protection might be provided by (non-farming) 'nature agents' also due to specialisation and scale effects.

On the one hand, we distinguish between the intrinsic value of the diversity and existence of species and the aesthetic value of landscape and visible richness of the nature, on the other. We would argue that meadows in the White Carpathians provide public goods to the global society in the form of the former values and to the local society in the form of the latter ones (for an analogous example see Hanley et al., 1997). This distinction indicates another (possible) level of divided ownership besides that originating from the agricultural (food and fibre) and environmental values. This definitely has an implication for the "optimal" governance structure.

Due to prohibitive costs associated with environmental transactions (discussed above), the private-rights-based regime leads to sub-optimal production of environmental output (Grafton, 2000). Bromley and Hodge (1990) suggested to depart from the traditional model and let the management (and exclusion) rights reside with the community or the state. If community rights are to be successful in addressing common pool problems, the collective interest must be accounted for in the decision-making and in the behaviour of resource users (Grafton, 2000). Ostrom (1990) stresses the following prerequisites as necessary for enduring community rights: Well-defined geographical boundaries, rules acceptable by the community and tailored to the resource, monitoring and enforcement capacities, resolution mechanisms for disputes, participation of most resource users in changes to collective rules, and recognition of collective rights by the outside authorities. Obviously, a property regime based on community rights is similar to the relational team described above, deploying community social capital (commitment and trust). A

property regime based on state rights is appropriate when large co-ordination is needed, and economies of size exist in terms of processing of information, monitoring and enforcement (Grafton, 2000). In both, community- and state-based property rights regimes the legal ownership of land does not matter unless it generates significant costs, which do not occur under sole ownership. Current protected landscape areas can be considered as state-rights-based property regimes at least to some extent (keeping in mind that we have divided ownership due to the splitting of control (rights) over agricultural and environmental attributes). In the following paragraphs, we will first describe the current organisation of the 'provision' of landscape and biodiversity, marking sources of significant transaction costs. Subsequently, we will suggest institutional innovations resulting in alternative arrangements with presumably lower transaction costs. It will include the option of the relational team bringing together local people including farmers with their social capital and representatives of 'global/national interest' (e.g. the state).

3. White Carpathians case study

The White Carpathians are a mountainous area in the East of the Czech Republic on the border with Slovakia. The area was settled for agriculture in the 16th and 17th centuries when much of the forests were cut or burned down. The poor soils only allowed for a pastoral agriculture of extensive cattle and sheep grazing with small domestic plots cultivated for cereals and potatoes. Traditional farming - non-mechanised and relying on low inputs - remained characteristic until the middle of the 20th century.

After collectivisation, in the period between the 1950s and the 1980s, there was an increase in the concentration of cattle stocks for both dairy and beef production. There was a switch to housing the animals throughout the year. Mineral fertilisers were applied to the grassland, and the grass and hay were mechanically cut. The Protected Landscape Area designation, imposed in 1980, was intended to safeguard biodiversity from these changes.

The protected area extends to 71,500 hectares, just over half of it being agricultural land. The zones with strongest protection - including restrictions on fertiliser and pesticide use and prescriptions of certain aspects of land management - cover 28,300 hectares, about a third of which is agricultural land.

Since 1989, the recession in dairy and beef markets has resulted in reduced concentrations of cattle. On the one hand, this has led to a beneficial extensification of production and animals have started to reappear on pastures. On the other hand, meadows that are less accessible or fall under fertiliser restrictions have little value any more to the farmers. The area of fallow agricultural land has grown, reaching 5 % by the late 1990s.

The significance of the landscape and biodiversity of the White Carpathians has been nationally and internationally recognised. The meadows are amongst the most species-rich plant associations in Europe, including many protected species. The mosaic of meadows, pastures and forests and the varied topography produce a variety of habitats, including some plant life adapted to dry conditions and some to humid conditions. This biodiversity can be diminished in a short period of time by such practices as fertilising or mulching, or by idling the land (Willems and Van Nieuwstadt, 1996). The land has to be mowed or grazed (in the proportion 2:1, as suggested by LA PLA of the White Car-

pathians). Stopping such management leads to shrubby growth that reduces the diversity of species.

Table 4 Farm Structure in the White Carpathians

Farm Size (ha)	Share in the Number of Farms (%)	Share in the Area (%)
Above 500	0.2	48
10 – 500	0.8	16
Below 10	99.0	32

Source: Sample survey of the Information Centre for Moravske Kopanice (ICMK, 2001)

Decollectivisation and land restitution have produced a dual farming structure. A few large farms over 500 hectares occupy almost half of the agricultural land; while 99 percent of farms are smaller than ten hectares and together account for about a third of the agricultural area. Most of the latter are household plots of less than two hectares. The household plots and smallholdings are mainly farmed for direct consumption and for supplementing other household incomes. The small and medium-sized commercial farms are run by people, often pensioners, who are keen to re-establish their family farms. Survey evidence suggests that these two groups are deeply committed to the landscape. The large commercial farms, in contrast, are very profit oriented. They are also sensitive to changes in market or policy incentives. They usually have land outside the protected zones. Typically their businesses are differentiated into intensive food and fibre production and extensive environmental quality management.

4. The current institutional arrangement in the White Carpathians

4.1 GOVERNANCE STRUCTURES STEMMING FROM THE ENVIRONMENTAL POLICY

The environmental policy for designated protected landscape areas comprises both direct regulations (on the use of fertilisers and pesticides, on grazing, etc.) and contracting for improving landscape and biodiversity (Law 114/1992). A requirement of proper grassland management is not explicitly mentioned in the legislation; it is argued by the environmental administration that it follows from the Law on the Protection of Agricultural Land (334/1992, amended by 231/1999). This is obviously a weak point – such a subordinated "legal" requirement is difficult to enforce. Originally, regulations on protected landscape areas restrict property rights without compensation. As pointed out by Slangen (2001), uncompensated regulations on resources would largely result in their incomplete or inefficient use. Thus, the result of uncompensated regulations has not only been that farmers have suffered from income losses, but also that land has been idling (abandoned), reducing the provision of landscape and biodiversity attributes in the White Carpathians.

Environmental legislation is implemented, monitored and enforced by the local administration of protected landscape area (LA PLA). Since 1992, the competencies and range of tasks of this body have significantly increased along with the increasing conservation requirements set to farmers and local communities. LA PLA is generally supposed to manage all environmental attributes: landscape, landscape amenities, biodiversity and microhabitats (see Table 3). However, the actual main LA PLA activity focuses on fulfilling regulations (such as fertiliser application, restrictions on grazing, etc.) and negotiating and governing contracts for microhabitat protection and landscape amenities.

Being very limited in contract opportunities, the overall landscape and biodiversity management relies only on information dissemination provided by LA PLA in association with agricultural landscape management programmes (before 2000) and LFA payments (after 2000).

LA PLA contracts for microhabitat protection and landscape amenities present very detailed management prescriptions with precisely calculated value of the service. In this case, the governing body (LA PLA) knows exactly what it wants from the producer (farmer) and can hence enforce the contract (Shleifer, 1998). The contracts assume separability and sufficiently low (acceptably high) measurement costs. These contracts are in principle available (accessible) for any land user operating in the area. However, it follows from interviews with LA PLA representatives that the identity of parties matters. The administration is concerned about the ability and reputation of the contractor to provide the service in a sufficient quality and at a reasonable low/high cost. Farmers are interested in these contracts, particularly, when they wish to restore degraded land (often previously abandoned meadows). This creates a self-enforcing safeguard. The contracts are not made for more than one year. The contracts (the programme) have been criticised mainly for their uncertainties: there is no guarantee that proposed management agreements will finally receive money from the state budget and the time spans between proposal making and payment may be rather long. In the light of the outlined theory, the LA PLA contracts are incomplete if we take the contract preparation period into account. Generally, contracts are not complex:

- if farmers are interested (i.e. they also envisage "agricultural" benefit) they will usually get the contract (provided financial resources are available) and
- if landholders (owners or tenants) are not interested (because of the lack of "non-environmental" benefit) the LA PLA will look for a nature agent.

In either case contractors are residual claimants.

Since the budget is very limited, contracting based on the environmental legislation is almost exclusively used to improve or maintain the highest natural values or to restore the habitats of valuable species, which as a rule is costly. There are obvious constraints for the LA PLA to maintain biodiversity and landscape at a larger extent by these types of contracts.

While observability or separability of transactions covered by the LA PLA contracts is high, this is not the case for transactions directed to maintain/enhance the overall biodiversity and landscape. In fact, those are subject to legal requirements for certain farm practices (no fertilisers, mowing). Monitoring capacities of the LA PLA are very limited; monitoring and enforcing related to biodiversity and landscape are, in general, costly and, in particular, accompanied with high organisational costs resulting from the "transitional" land tenure system. First, LA PLA identifies a landowner (in the cadastral office) and then the landowner names the land operator(s). It is obviously an inefficient system, since there are thousand landowners (and many of them are not identified), but much less operators. Therefore (to avoid these costs), the LA PLA sees its role in permanent and patient education of agents acting in the White Carpathians rather than in sanctioning improper practices, especially those which are subjected to the MoA support programmes. Extension capacities of LA PLA are also limited. However, a close co-operation with other organisations, particularly NGOs (e.g. Czech Union for Nature Protection, Information Centre for (development of) Moravske Kopanice) has been developed. Over the last decade, the LA PLA has noticed increasing interest of local

agents - farmers as well as municipalities - in gathering information and exchanging opinions on conservation practices.

4.2 GOVERNANCE STRUCTURE TO ADMINISTRATE INCENTIVES OF PROGRAMMES OF THE MOA – AGRICULTURAL AGENCY OF MOA

The regional agricultural agencies (AA) of the MoA are responsible for administrating contracts stemming from agricultural policy. On large scale, protection of landscape and biodiversity has been encouraged by payments from the budget of the MoA. Initially (1997-2000), it rendered support to landscape management. In 2001, it was replaced by cross compliance associated with compensations for less favoured conditions and environmental restrictions. The proclaimed objective of this programme has been to modify farming practices in a way that would best yield environmental quality (biodiversity and landscape). This is understandable, since historically "farmland biodiversity and cultural landscape" are outcomes of agricultural cultivation of land. However, the programme was launched at a time when farmers had tended to stop cultivating land at all. Therefore, the primary objective of the MoA programme was to stimulate farmers to continue cultivation by providing income incentives, while the environmental objectives were supposed to be achieved by means of cross compliance. The original programme was not restricted to farmers. Hence, nature agents (e.g. mowing and hay harvesting companies) emerged, which in contrast to farmers have been primarily oriented on the production of environmental amenities. Two groups started to oppose this arrangement: the first ones (farmers and their associations) argued that money determined to support farm income flew out of the sector, while the other group (the conservation authority and municipalities) expressed their doubts whether nature agents would contribute to sustainability. The latter was based on the observation that nature agents were often not local residents and were, thus, lacking local knowledge and commitment to provide the service, especially when the programme conditions and budget continued to vary from year to year. MoA responded to this criticism and restricted the eligibility to only farmers. Moreover, a minimum livestock unit (0.15) per hectare was introduced with at least half of it being cattle or sheep. With this regulation, MoA has coupled environmental attributes to "food & fibre" production.

Facing a minimum livestock unit regulation in the MoA contracts, farmers more or less have to combine commercial farming with relatively sophisticated marketing (beef market). To cover the cost of conversion and make beef/sheep farming economically viable, farmers need supplementary assistance. At the moment there are suckle cow and ewe premiums, a premium for cattle or sheep on pasture and payments for ecological production. Accepting the latter farmers are driven into even more sophisticated marketing. In the effect,

(a) farmers maximise their income from (conventional) beef and sheep production, while environmental services are minimised to the level at which they still get the fixed payment per hectare. The transaction of producing and delivering the public goods of landscape and biodiversity has become complex with quite a high degree of uncertainty due to the instability of beef market and underdevelopment of sheep market;
(b) if a farm switches to ecological production, the provision of landscape and biodiversity is included in the farmers' objective functions. However, unknown markets for ecological products put the price premiums at risk. In addition, ecological farming

requires considerable knowledge (human capital). The complexity is high and it is likely that the objective function will not be maximised.

Until recently, the AA lacked capacity to monitor all plots to which payments were assigned. Hence, there was a high risk of opportunistic behaviour and hidden actions of farmers. In 2000, the AA monitored the region by aerial screening for the first time and the evaluation was discussed with the LA PLA. The screening has shown that farmers did not cultivate bands and strips of meadows along forests already invaded by shrubs and young trees. This was interpreted as falsely declared area which accounted up to 20 percent of the total declared area. The AA claimed the subsidy to be proportionally returned.

It was evident from interviews that land users (farmers) were becoming aware of this monitoring capacity of the AA. Legally, farmers are entitled to get the payment on the overall registered area. It is in the interest of farmers to remove all shrubs and forest invasions. However, the removal does involve costs. Farmers will not do it until the costs are outweighed by benefits, e.g. fixed costs per hectare drop while revenue (over a period) per hectare increases. The former can be reached by expanding the area, the latter may result from beef premiums or higher beef prices and increased beef production. If grasslands are out of the zone 1, biodiversity and landscape value of shrubs and bushes can be (it is likely) higher than the one of meadows. As a result, MoA payments may contribute to a reduction of biodiversity and landscape value.

It is important to understand that aerial screening disclosed places that had been deficient in treatment for long times, places where meadows had already reverted to scrub with thick stems of shrubs that could not be cut by ordinary machines any more. In light of the explanation given in the previous paragraph, farmers have had so far no incentive to remove shrubs and treat the overall registered area. On the other hand, they have had no basis for declaring less area. Furthermore, the AA continues to lack capacity for monitoring the quality and current (short-term) absence of treatment (current compliance). This brings us to the issue of trust and commitment. However, the identity of parties gets only little attention in MoA contracts. The payments are mandatory and the LA PLA approval of current compliance (non-violation of environmental regulations) is formal. Actually, the LA PLA cannot do more than confirm that there is no record of a conflict in the recent past, acknowledging that its monitoring is insufficient too.

The advantage of the agricultural support policy enacted in 2000 is that it has introduced compensations for regulatory restrictions (e.g. on fertiliser application) in the landscape protected areas (mainly in zones 1 and 2). It must be stressed that these compensations likewise apply to mountainous areas. They do not constitute a separate programme, and it is supposed that payments in zones 1 and 2 are high enough to cover also income losses due to restrictions. It was evident from interviews in the White Carpathians that farmers had rarely been aware of this fact.

Despite the fact that the protection governance was legally placed with the LA PLA, MoA contracts determine the provision of biodiversity and landscape. These contracts are (were) weak management agreements with action-related remuneration. They lack most of contractual features relevant to transaction characteristics of biodiversity and landscape (identity of parties, longer duration, safeguards, non-price coordination etc.). The MoA programme is largely criticised by the LA PLA for these imperfections. This

attitude prevents LA PLA officers to take the agricultural support as a serious effort to promote production of landscape and biodiversity.

4.3 WEAKNESSES OF THE CURRENT SYSTEM

Generally, commercial farmers have exhibited their willingness to provide landscape and biodiversity by responding positively and to large extent to environmental and agricultural policy incentives. Although their commitment has been limited to minimum income, they need to survive. Currently, the maintenance and improvement of biodiversity and landscape relies on commercial farming. In contrast, owners/operators of land that do not engage in livestock farming have been "effectively" excluded from the agricultural support. In order to get the payments, some landowners attempted to start cattle or sheep production, but the majority of particularly small landowners have been driven to rent their land to large commercial farmers/farming companies. Large operators inherited and gained the monopoly position on the local land (lease) market, i.e. there is often one large operator surrounding one village. Thus the opportunity value of land has dropped significantly and rents have fallen almost to zero. As a result, they also gained the local monopoly and monopsony in providing environmental values. The position of large operators is even strengthened by the fact that large farms reduce the need and cost of horizontal co-ordination. Also LA PLA prefers to deal with large farmers in provision of overall biodiversity and landscape. However, more horizontal co-ordination is still important in several respects: scale effects exist in conservation of some habitats and species, in information collection and distribution and in organising marketing of ecological products. This need is significantly underestimated by both LA PLA and AA. The gap is filled by an NGO, the Information Centre for the development of Moravske Kopanice[1] (ICMK). ICMK has initiated mutual communication among farmers, exchange of experience and knowledge and transfer and spread of environmentally proper farming practices. It has also encouraged farmers to organise themselves in a marketing co-operative to co-ordinate production and distribution of ecological and locally specific (labelled) products. The listed activities indicate that ICMK plays an important role in vertical co-ordination too. Since the NGO has mediated the communication between farmers and authorities, it has contributed to improved co-ordination between LA PLA and AA.

The mission of LA PLA highlights the preservation of high natural values for global society, while it almost completely omits the fact that the protected area is the environment of local inhabitants and might be as well a place for recreation of urban people. Officers of AA criticised LA PLA for little understanding that maintaining human settlements (farmers) in the region would require to balance economic and conservation interests.

Local people are concerned about the aesthetics of their environment as well as the biodiversity. However, those members of local communities, who are not engaged in commercial farming, find it difficult to participate in the protection of landscape and biodiversity although their concerns fit with those of the LA PLA. This contributes to the reservation of local people against conservation activities of commercial farmers.

[1] Moravske Kopanice is a sub-region of the White Carpathians. However, the influence of ICMK exceeds this sub-region.

Local authorities (mayors) clearly pointed out that for them wildlife and landscape characteristics would in many respects belong to the local community. Therefore, they claimed to be involved in organising the provision of these environmental qualities. In the current support policy of MoA, the local municipalities missed a role for small local land users and owners who (as mayors believed) might substantially contribute to the character of the local areas. On the other hand, there is an evident wish of commercial farmers, particularly those who switched to ecological production, to build a good reputation among the local people. In their opinion, however, the current arrangements were not helpful to this end.

Also NGOs miss to address the involvement of local people in provision, co-ordination and finally positive consumption of environmental values, like biodiversity and landscape. The ICMK has concentrated on commercial farming and environmental attributes. The other NGOs tend to participate in conservation either directly (as nature agents), providing some conservation services on their costs or indirectly by increasing awareness among general public and donors. There is an NGO closely related to the LA PLA (The Czech Union for Nature Protection, CSOP) doing both. For instance, CSOP shares most of LA PLA's perceptions of conservation problems, and most of the LA PLA officers are members of CSOP too. Thus, other actors in the region consider the activities of CSOP in the protected area to be LA PLA activities. The intention of CSOP as well as of LA PLA is to renew most valuable meadows, often already assigned as nature reserves, to their original pre-collectivisation state. This means in many cases to clean in fact (long-)afforested meadows. CSOP/LA PLA are even more keen on doing so, after they realised that on newly cleaned meadows biodiversity reaches a peak within a few years. This activity is difficult to understand by the other farmers. Because such areas are usually remote and too poor on nutrients for livestock feeding, it seems to farmers strange or unfair that resources are spent there. The farmers argue that their meadows and pastures nearby might have lower diversity of species, although their landscape value is high (by contributing to very nice scenery).

5. Policy options

The case study identifies obstacles to the long-term sustainability of land management in marginal areas:

- the division and uncertainty surrounding property rights to the land (or better CCA);
- the limited involvement of local people (particularly those that are not commercial farmers) in determining how the area should be managed and developed;
- poor horizontal co-ordination including the difficulties of integrating measures and policies for agricultural support and environmental protection – in the effect
- split vertical co-ordination (between the LA PLA and MoA)
- insufficient (MoA) contracts to govern transactions relating to biodiversity and landscape

Here we present three policy options, addressing the above-identified obstacles:

(a) The state represented by LA PLA takes over the ownership and management of all the land that is most valuable from a conservation point of view

(b) Improved horizontal and vertical co-ordination by integrating environmental and agricultural policies at all levels; it should also include improved contracts for biodiversity and landscape.

(c) Agri-environmental policies are delivered through local partnerships which ensure that they are responsive to local people.

The options concentrate first of all on provision of overall biodiversity and landscape. They are proposed to highlight some aspects of alternative property rights setting and institutional arrangements.

5.1 POLICY OPTION A: LA PLA TAKES OVER THE OWNERSHIP AND MANAGEMENT

The officers of LA PLA favour a simplification in the institutional arrangements surrounding the management and control of the land, i.e. unified ownership of all land attributes. In their opinion, the most effective way of achieving this would be if the state acquired the most valuable land in the sense of natural values. The LA PLA itself would then become the provider of the public goods contracting out the maintenance tasks, such as mowing the grass. In this way, many of the problems connected with inter-agency liaison and inadequate delineation of property rights could be overcome. The LA PLA also sees this as a means of avoiding the opportunistic behaviour of actors (farmers claiming meadow management payments for land that has turned into scrub).

The idea of the LA PLA as landowner, however, is not widely supported. The representatives of the municipalities, the officers of the Agricultural Agency and the local farmers – they all oppose the LA PLA's preferred model. The municipal representatives fear that it would force people from the region leading to a loss of rural amenities. The AA officers argue that the landscape of the White Carpathians was a cultural one that was the outcome of the interaction between farming and nature. The local farmers fear that they would lose their livelihoods.

The key element of this proposal rests in the extent of which exclusion rights are held, particularly rights on those environmental attributes that are joined with the agricultural ones. It is obvious from the case study that LA PLA feels in the position of a claimant, i.e. holding management rights but not the exclusion right over ecological attributes. LA PLA blames agricultural policy of protecting farmers against exclusion, what makes it difficult to exercise management (rules). In fact, the landowners do not hold the exclusion rights over all CCA, particularly, ecological attributes (as held by PLA). Because it is impossible to separate agricultural and ecological attributes and distribute the control over them to farmers and the LA PLA, respectively, co-ordination is needed.

The purchase of land by the state and the consequent management by an environmental administration (e.g. LA PLA) might be regarded as a very pragmatic approach in the respect of reducing co-ordination costs. However, unified ownership will improve co-ordination only partly. As the separation of agricultural and ecological attributes is impossible, it is also impossible to lease agricultural or ecological attributes separately. At the same time, LA PLA may loose provision of landscape features, which are linked to farmers' dwelling in the countryside, and probably are better achievable by co-ordination at community level or even by an individual property rights regime.

In contrast to current LA PLA contracts, the contracts for overall biodiversity and landscape will have to be related to input, requiring much higher monitoring costs and significant horizontal co-ordination of contractor activities. Moreover, we found that the economic interest of farmers/owners was to invest in the improvement of the resource

when removing shrubs. But this interest will probably vanish. As pointed out by Falconer (2002), farmland biodiversity and cultural landscape maintenance require relational teamwork, a precondition that will not change with the change of ownership. Therefore, more stable (long-term) co-operation with agents will remain very important.

The obvious advantage of this option is that the land managers at PLA have all information about conservation needs and practices at hand. Despite this potential benefit of state-based rights, many examples exist that common pool resources degraded under PLA management, especially when state-based rights superseded pre-existing private or community rights (Grafton, 2000).

5.2 POLICY OPTION B: IMPROVED HORIZONTAL AND VERTICAL CO-OPERATION BY INTEGRATING AGRICULTURAL AND ENVIRONMENTAL POLICIES

The second option responds to the loss of environmental benefits due to the split of co-ordination competencies between MoA and MoE, on the one hand, and insufficiently designed contracts, on the other. It is proposed as a unified agricultural and environmental policy framework that sets certain restrictions on land use (and compensates them) and provides incentives to farmers to produce environmental amenities. This option recognises that the land and natural environment in protected areas as the White Carpathians are probably best managed and conserved through extensive farming.

This scenario differs from the current political and organisational arrangement in so far as it supposes co-ordination to be fully in hands of the local administration of protected landscape areas, while financial resources will continue to flow from the MoA budget. In practice, the contracts will be made between farmers and the LA PLA that decides on the choice and targeting of measures. To facilitate achievement of desired environmental effects, the agri-environmental policy has to be rich in measures. Therefore, we suppose that also the national agri-environmental programme framework should be set up in close co-operation between MoA and MoE. Grassland management will be ensured by neo-classical contracts; their duration will be expanded (to 5 years) and the applicant will have to demonstrate that he/she has the capacity to provide the service at the expected extent and quality. Non-use values (e.g. scrubs along the forests) will be recognised and hence contracted with farmers. However, more relational contracts will still be needed for overall protection of landscape and biodiversity. This demand results, for instance, from the highly fragmented land ownership that may hinder sustainable management of many high natural valuable sites if sufficient co-ordination and co-operation are missing.

In protected landscape areas, it will necessary to strengthen/build up LA PLA capacity to prepare, negotiate and co-ordinate new contracts. Implementing contracts of neo-classical character requires deploying social capital of local provenience. It seems (from the case study analysis) that there is sufficient social capital available in the White Carpathians. Doubts may arise if the situation is similar in all other 27 protected landscape areas and national parks.

It may also be doubtful whether this option improves participation of non-farming population. It can be expected that MoA funds are only eligible for farmers, constituting the continuous need for additional MoE measures and budget funds. The proposed arrangement for PLAs will not be applicable to organising the provision of landscape and

biodiversity in marginal areas outside the PLAs. Such organisational efforts outside the PLAs will require increasing capacities at the agricultural agencies (to ensure that the contracts will be neo-classical). However, a local partner with environmental concerns would be desirable.

5.3 POLICY OPTION C: AGRI-ENVIRONMENTAL POLICIES DELIVERED THROUGH LOCAL PARTNERSHIPS

This policy option responds to imperfections in horizontal and vertical co-ordination in the current arrangement: insufficient MoA contracts and inadequate (poor) involvement of local people in the decision making on how the area should be managed and developed. In this scenario, farmers are still the entitled land users (owners, rightful tenants), but the local community has a right and a capacity to influence the level and quality of environmental services provided in the PLA; i.e. to set rules (management right) and regulate access to the resource (exclusion right). The scenario reflects the argument that the local community is the most important consumer of environmental goods. It might be the landscape, in general, a number of landscape amenities or some wildlife that will contribute to the exclusivity of a site (village) and may attract tourists. Likewise, it can be a spot nature reserve or a particular protected animal that yield the same effect.

Basically, this option would raise the influence of the local community in decision-making. It would require a substantial revision of the policy framework, on the one hand, and of the local arrangement, on the other. The main change would rest in the need for consensus amongst all local actors (representatives of the local people, the LA PLA, representatives of the farmers, the AA, etc.) about development and conservation priorities at the local/regional levels. To reach consensus an organisation is needed. We suggest establishing an environmental co-operative involving at least the above-mentioned actors as members. Such co-operative should be obligatory in the protected landscape areas and voluntary outside them. The co-operative would facilitate public discussion on conservation in the area of concern. The role of the LA PLA would change from a master planner toward a representative of national and global interests in the public discussion.

The important output of the public discussion and the work of the co-operative will be a master (management) plan. In the protected areas it will have defined minimum contents. The master plan sets the rules of using land in relation to most agricultural and environmental attributes. It is evident that agricultural, environmental and rural development policies will merge at the local level. It will be preferable if the policies are co-ordinated at the national level as well. Similarly to Option B, the policies have to be rich in the measures they offer. Also the budget should be reasonably balanced. To ensure a serious involvement of municipalities and underline their decision-making role, co-financing (rather very small) is proposed. The introduction of a co-operative and the involvement of local authorities will increase horizontal co-ordination and facilitate relational contracts. Of course, the national programme/budget framework should be settled for long time periods to ensure that the costs are covered that arise with building relational teams.

There are several difficulties associated with this policy option. First of all, it would represent a major shift away from the current arrangements. It would require a new financial framework, which may be difficult to agree at the very top level if the agricul-

tural lobby is too strong. Another weakness of the scenario may show up if the power of the local community is high but environmental awareness low. Then the production of environmental goods will likely be much lower than socially (nationally, globally) demanded. Furthermore, a local community/co-operative may lack capacity to control farmers who have a strong position both as large farmers and beneficiaries of specific agricultural policies. Farms of one to two thousand hectares usually spread over a territory of two or more villages. This might require that villagers come together and create micro-regions (one micro-region can cover the whole protected landscape area), but it will definitely require that the power of environmental co-operatives, operating in the communities or micro-regions, will be recognised by the government. And in the end, there might be little potential for collective action, which would lead to a failure of this policy option.

This policy option is attractive for its assumption that if the local community actors get more responsibility in the organisation of environmental services conservation awareness will grow in the area and the local community will give its support to the local farmers as providers of these services. If such a policy is successful, the effect of social learning amongst policy actors (especially local community stakeholders and farmers) will substantially increase the sustainability of nature conservation.

6. Conclusions

Options were designed to highlight certain aspects of institutional arrangements for provision of landscape and biodiversity. We particularly investigated the following characteristics: who actually organises, sets rules and provides landscape and biodiversity, which kinds of organisational forms are available, what are the requirements for social capital and how are economies of size reflected or the needs for large-scale co-ordination. Table 5 summarises and compares the options with respect to the mentioned characteristics. The gradual change of the role of the state throughout the options can be observed. While in the first option the state is entirely responsible for landscape and biodiversity management, in the third option, the state sets minimum rules and authorises locally or regionally based bodies, i.e. environmental co-operatives, to organise the provision of biodiversity and landscape. The participation of farmers or nature agents in decision making is gradually increasing. The need for social capital goes hand in hand with it.

Table 5 Comparison of option characteristics

OPTION	**A**	**B**	**C**
Who does organise?	State	State/ participation of farmers essential	Local partnership
Who does set rules? (management right)	State	State	State + local partnership
Provider	State	Farmers	Farmers, nature agents
Organisation/ contracts	Principal agent, classical contracts	Hybrid, neo-classical contracts	Environmental Co-operatives/ relational contracts
Need for Social capital	Little concern	Medium (to enable neo-classical contracts)	High (to enable collective action)

Reflection of economies of size, ability of large scale co-ordination	High in principle, doubtful in practice	High	Low-medium (depends on the size of a co-op)

Source: own classification

In Option A, the involvement of local inhabitants is not of concern, while in the other two scenarios local people matter. The state will carry high costs of horizontal co-ordination if it is not able to deploy local social (and often also human) capital. Such a organisation will require a lot of trained staff and a well-designed decision making procedure. Option C is preferable to scenarios A and B if there is little benefit from economies of size in terms of information and enforcement. Measurement cost is also an important determinant for the choice of options. Local partnership may significantly reduce these costs due to a high level of trust. State-based regimes may carry these costs and deploy relatively expensive technical equipment. Locally/regionally based organisations will always tend to suffer inability to envisage implications of their decisions in the national or even global context.

If attributes (groups of attributes) are (weakly) separable from other countryside and community attributes, all three regimes may co-exist. However, it seems that Option A has only very little potential to improve the provision of landscape and biodiversity. It may be used in case that there is actually very little interest by local land users/owners to cultivate land in the way which ensures high natural values. Option B is very close to the current arrangement. Transition costs are rather low – it will be rather political costs (loss of control) that have to be paid. Adopting Option B can be regarded as the first step of improving organisation for providing landscape and biodiversity. The following step will be to merge this option with Option C wherever this will be relevant.

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