

Management Alternatives for the Commonlands of Iberian Peninsula: A Multi-Criteria Stakeholder's Perspective

J A R Lopes

Abstract:

Communal lands occupy approximately 1 million ha in NW Iberian Peninsula (400000 in north Portugal and 600000 in Galicia), with high average areas (circa 500 ha in Portugal and 200 ha in Galicia), and are owned by approximately 2900 communities in Galicia and 1000 in north Portugal. During centuries, *baldios* (Portugal) and *Montes Veciñais en Man Común* (MVMC, Galicia) played an essential role in the rural economy of their owner communities. This role was lost during the twentieth century due to the massive forestation and the decline of agriculture prominence. The restoration of democratic regimes in both countries returned the *baldios* and MVMC to their owner communities, now declining, aging, disrupted and disorganized. The multi-functional character of the use of commonlands and the involvement of multiple users and stakeholders, results in complex and uncertain management practices. Thus, their evaluation must be carried out with a methodology capable of assessing contradictory objectives and difficult to quantify and compare. The paper describes the use of a multiple criteria decision aid technique as decision tool for assessing criteria and indicators designed to evaluate management alternatives for the communal lands. The methods are highly transparent, easy to understand, and offer a convenient environment for participatory evaluation processes. This exercise aimed to build an approach to the knowledge of the overall factors evolved in the situation. The results show that current management modalities are not satisfactory in the stakeholders' point of view. The preferred management alternative by most of the stakeholder groups was a theoretical (currently non-existent) management model where the communities and the Administration are co-managers in a parity relationship, and have professional managers. The results also highlight the fact that there is no valuable decision that doesn't take into account the incorporation of stakeholders' desires, knowledge and preferences.

Conference Themes:

1. 'Property rights: recognition, protection and creation'.
2. 'Community and governance: exploring new approaches'.

1. INTRODUCTION

Baldios and *Montes Veciñais en Man Común* (MVMC) are lands with a peculiar type of property – private though collective. They are significantly represented in northwest Iberian Peninsula (north Portugal and Galicia), occupying more than a quarter of the region's total surface. Approximately 2,900 communities in Galicia

and 1,000 in Portugal own those communal lands of predominant forestry use (Baptista, et al. 2002; Fernández Leiceaga, et al. 2006).

There are two main management modalities – direct management by the communities and co-management with the State (in these cases the State holds a prominent position), the latter being dominant in Galicia and even more in Portugal. Most of these communal lands, in spite of their management modality, are characterized by the sub-utilization of their resources. Communities find nowadays their income sources outside the communal lands and, although their connection with the land is still strong, its nature is quite different from the times when agriculture used to be the dominant, sometimes exclusive, activity. The connection to the markets, now indispensable, imposes an adequate technical preparation that most commoners don't have. There is a lack of support – institutional, technical support – disrespecting inclusively legal dispositions.

In the co-management modality, the main decisions are taken by the State services, namely regarding the seasons and harvest volume of timber, forestation or reforestation, and other forestry operations. Any incomes related to wood harvesting are shared between the State and the communities, according to percentages established by law. While the State services dominate the technical aspects of forestry exploration, their slow and routine style functioning does not match with the required dynamic management responses.

Associative practices are being lost, negatively conditioning the participation of commoners in the life of their commonlands, reduced to the – low – presence in annual meetings. Traditional knowledge and uses of the communities are not valorised. The number of communities which delegate the management of their lands is increasing (in the Portuguese case by delegating in Parish Boards). Well succeeded cases are mostly dependent on the strong leadership of one of the community members.

There is a close relation between the social objectives of local and regional development and the adequate performance of the communal lands:

- (i) Dimensions and natural resources. The communal lands of northwest Iberian Peninsula occupy a total of approximately one million hectares with high average surface (circa 500 and 200 hectares, respectively in Portugal and Galicia), most meaningful in regions of very small and fragmented property. Natural resources, although under-used, are an important income source, regardless of occupying the least productive soils. Even though communal lands occupy the least productive soils and despite the sub-utilization above referred, natural resources are an important income source and the potentialities for new uses and good environmental practices are well stated.
- (ii) Human resources. Besides the native residents of the rural areas, the small rural villages are also inhabited by “urban” people - though not economically dependent on the use of the commonlands – that arrive impermanent, semi-permanently or permanently. And there is also the return - temporary or permanent – of former emigrants of various ages and life-experiences. The settlement of this people will be more effective if related to the opportunities for job generation.

The democratic legislation produced in recent times in both countries encourages the communal property characteristics of long-term stability. However, the decisive factor will be the fulfilment of communal lands' social, economic and environmental functions, exercising well designed planning of the territory's use.

The adequate use of natural local aptitudes depends at a large extent on management organization and practices.

The analysis of alternative management models allows for the discussion of strong and weak aspects, the potentialities and the obstacles that the management of the communal lands has to stand for. This analysis has to be able to integrate ecologic, social and economic interactions, considering not only the facts but also the values and preferences of group and individual stakeholders.

The objective of this work is to assess, using multi-criteria analysis to integrate the points of view, the preferences and trade-offs of stakeholders, the best management alternative for the commonlands of northwest Iberian Peninsula. The need for and the advantages of stakeholder participation in multi-criteria decision-aid framework has been increasingly acknowledged and valorised (Banville, et al 1998; Mendoza and Prabhu 2000; Munda 2004; Antunes, et al 2006). Regarding the formation of contemporary public policies, 'it is hard to imagine any viable alternative to "extended peer communities"' (Munda 2004: 667).

Section 2 refers to MCA's characteristics which require the methodology we use. This methodology is described in Section 3. Section 4 presents 'results' and 'discussion' and Section 5 concludes.

2. THE APPEAL OF MULTI-CRITERIA ANALYSIS

The multi-functional character of the forests (productive, social, and environmental) and the involvement of multiple users and stakeholders, results in complex and uncertain management practices. Thus, the evaluation of their management must be carried out following a methodology capable of assessing contradictory objectives as well as those difficult to quantify and compare.

The ability of Multi-Criteria Analysis (MCA) to consider multiple alternatives creates a discussion environment where different management alternatives can be simultaneously considered and accommodated in a management situation which may involve decision makers including stakeholders as individuals or groups. The appeal and wide application of Multiple Criteria Decision Aid (MCDA) are due in part to its inherently desirable features, namely: (1) it seeks to take explicit account [confirmar se esta palavra em inglês contém o significado (pretendido) de quantificação] of multiple, conflicting criteria or objectives; (2) it helps to structure the management problem; (3) it provides a model that can serve as a focus for discussion; and (4) it offers a process that leads to rational, justifiable, and explainable decisions (Mendoza and Martins 2006). In addition, from a practical perspective, MCDA also offers the following characteristics: (1) it can deal with mixed sets of data, both quantitative and qualitative, including expert opinions; (2) its modelling framework is simple and transparent; and (3) it is conveniently structured to enable a collaborative planning and decision-making environment (Mendoza and Prabhu 2003).

Originally developed by Saaty (1980), Analytical Hierarchy Process (AHP) is a general theory of measurement based on mathematical and psychological foundations (Kurttila, et al 2000). The present study poses the same type of problems characteristic of these theories (Malczewski 1999): (i) a common objective that the stakeholders aim to achieve – in the present case, rural development; (ii) the stakeholder groups and the evaluation they make of the criteria based on their experience and knowledge; (iii) a set of criteria for the evaluation of alternatives; (iv) a set of alternatives; and (v) a set of results or consequences associated to each pair alternative-criterion.

3. METHODOLOGY

The five management alternatives assessed in this study were the two already existent, (1) direct management by the communities and (2) co-management with the State, and three others currently non-existent, (3) management by municipalities, (4) private management, and (5) mixed management by the communities and the State but with a directors board where the two parts have equal representation (Table 1). A decision model of this problem could be formulated as given in Figure 1.

The choice of the criteria used for the assessment of the five management alternatives was obtained during an earlier phase of the study, designed to identify the parameters of communal lands contribution to rural development (Table 2). The study was carried out with 10 people belonging to five stakeholder groups (which should integrate the stakeholders more connected with the current and potential uses of the common lands): (1) local communities of joint parties – the members of the community owning the communal lands, (2) elected local authorities, (3) forestry services technicians, (4) forestry experts, and (5) local development agents.

The criteria and management alternatives were analyzed with the Analytic Hierarchy Process (AHP) and pairwise comparisons technique methodologies. Each stakeholder expressed its level of preference with a scale of 1 to 9 where 1 indicates that the two criteria in analysis are equally important and 9 indicates the absolute importance of one criterion over the other. To determine the relative importance of decision elements, the stakeholder preferences were analyzed on pairwise reciprocal matrices (e.g. Janikowski, et al 2000; Ananda and Herath 2003) like shown in Figure 2, where b_i is the importance of decision element i .

The weight vectors of the decision elements were calculated as described in Malczewski (1999). The values in each reciprocal matrix were normalized by dividing the value of a cell by the sum of the respective column. The average values of each row of the normalized matrix were taken as the weight vectors (W), i.e. the overall average of criteria comparisons. The weight vector of each criterion was multiplied by the original value in the reciprocal matrix and the sum of each row of the resulting matrix was divided by the respective weight vector to obtain an inconsistency vector. The sum of the inconsistency vectors is the lambda (λ) value of the reciprocal matrix.

To measure inconsistency of pairwise comparisons, a consistency index, CI, was computed comparing the λ value of each reciprocal matrix with total number of columns or rows, n (Equation 1). The more consistent comparisons will result in values λ closer to n ; if the pairwise comparisons do not include any inconsistencies, $\lambda=n$.

$$CI = \frac{(\lambda - n)}{(n - 1)} \quad (1)$$

To measure the coherence of the pairwise comparisons, a coherence ratio (CR) was calculated on basis of the relation between CI of each pairwise comparison and the inconsistency index, RI, of reciprocal random matrices (Equation 2). Coherence ratios with values ≤ 0.10 were considered acceptable (Kangas 1994).

$$CR = \frac{CI}{RI} \quad (2)$$

These calculations were performed for each stakeholder, on 14 reciprocal matrices. The first matrix was the comparison of the three criteria (social and cultural, economic and management, environmental), the following three matrices compared the sub-criteria in each main criteria and the other 10 matrices compared the management alternatives for each of the 10 sub-criteria (Table 2). The final weight of each sub-criterion was obtained by multiplying its weight by the weight of its respective criterion in the hierarchy structure (Malczewski 1999).

To obtain the final decision matrix for each stakeholder, the weight of each sub-criterion (rows) was multiplied by the weight vector of each management alternative (columns), and the sums of the columns were the value representing the stakeholder preference taking all criteria into account. Final assessment of each management alternative was calculated as the average value of the final decision matrix of each stakeholder.

4. RESULTS AND DISCUSSION

The comparison of the criteria shows that economic aspects are the most valorised while environmental aspects are the least valorised by the stakeholders. The importance of environmental aspects in a rural world is part of everyday life in such a way that may justify the different opinions of the stakeholders compared to current 'urban' tendencies, which tend to valorise these aspects in a world that puts them at stake.

In social aspects, 'job generation' was the most valorised sub-criteria, reflecting the difficulties of the rural world to create jobs. The evaluation of the sub-criteria in economic aspects was more even, with 'diversification of income sources' being the most valorised sub-criteria. In fact, since the rural world is mainly dependent on a seasonal agriculture, it is important to have diverse non-agrarian tasks in order to generate income during the whole year. 'Soil and water protection' was considered the most important sub-criteria of the environmental aspects.

When all sub-criteria were compared, 'job creation', 'diversification of income sources', and 'forestry production (wood)' were the most valorised, while sub-criteria in environmental aspects (with the exception of 'soil and water protection') had the lowest significance.

The final decision for the management of commonlands in north-western Iberian Peninsula choose the alternative 'mixed' as the best one to fulfil the general objective of local rural development (Figure 3). On the opposite, the

alternative of management by private entities was the least preferred by the stakeholder groups.

When analyzed separately, the opinions differed between groups, with mixed management being chosen by three of the five stakeholder groups. This management modality is somewhat similar to the ones already existing; it is suitable for current legislation and also has the advantage of joining financial and technical support as well as field knowledge. Furthermore, professional management would allow the commonlands to respond to the market demands and fulfil environmental and cultural functions. The opinions of the stakeholders penalize the management models farther away from their reality, i.e., the ones for which there is no legal support.

The alternative of management by private entities was in general considered to be a good option in areas directly linked to productive activities (Figure 4), as management efficiency results in profit. Private entities only rent to the communal lands parcels either suitable for forestry or with special characteristics such as areas used for antennas, Aeolian parks or quarries. Both in Portugal and Galicia, the enterprises renting parcels for forestry production are connected to paper-mill industries, and these industries are well known for their expertise with rapid growing trees, namely eucalypt, the most widely used tree for that purpose. However, the management alternative by private entities was the least valorised in terms of environmental and social aspects (Figure 4).

Management by the municipalities was poorly evaluated in terms of economic aspects, although above the private entities (Figure 4). Municipalities were considered most important for 'job generation' and 'preservation of landscape values/open space'. Municipalities are big companies, assuring most of the local jobs, and they are also recognized for their interest in local tourism. Municipalities promoting local production and local specificities could have in the communal lands potential allies. Communal lands are depositaries of outstanding cultural patrimony and leisure and tourism areas, and they can also contribute to the development of various products with guarantee of origin and quality, from beef to linen handcraft. Other municipalities, or in other circumstances, are only interested in controlling the communal property. In Portugal, when the communities are not self-organized, the Parish Boards may replace the Directive Boards in the management of the *baldios*, either alone or together with the Administration. However, this management alternative was not evaluated in this work since there is no correspondent situation in Galicia. The alternative of management by the Administration was badly evaluated by the stakeholder groups in all but the environmental aspects sub-criteria (Figure 4).

The alternative of management by the communities was in general well evaluated, being the 'communitarian uses/cultural patrimony' the most valorised of all sub-criteria (Figure 4). The least valorised sub-criteria were 'forestry production (wood)' and 'preservation of landscape values/open space'. The alternative management 'mixed' was evenly evaluated in relation to all sub-criteria, reflecting the choice of being the best management modality for the purpose of local rural development. This choice may indicate that the stakeholders considered this alternative model as 'improbable' by the stakeholders, and that they chose it when hesitating between alternatives. On the other hand, because it is similar to the model of co-management already

practiced by the communities and the Administration with the advantage of presenting a parity relationship between co-managers, and since it predicts the existence of professional management, it is possible that this alternative was in fact the most attractive one for the stakeholder groups.

It is interesting to note that whenever there is a correspondence between the stakeholder group and one of the management alternatives, this was the most valorised_option in all cases (Figure 5). The stakeholders involved in this study tended to indicate more appealing solutions or solutions reflecting their own ideals. In fact, there is no correspondence between the desirable and the practice; and when the communities have the opportunity to change from the model of co-management with the Administration to direct management, they do not try.

During the performed interviews, one of the main negative signs related to the current management of those commonlands was the non-use of property rights, either by disinterest or by imposition. It was clear that the stakeholders felt that a more professional management, of enterprising character, could assure the implementation of their property rights. Although the communal lands in northwest Iberian Peninsula are normally located in mountain areas and/or areas with low soil productivity, they are being increasingly attractive for external interests. Forestry patrimony is either valuable or has high potential; herding is no longer practiced in a collective way, but the lands are demanded by cattle, horses and sheep breeders. Besides quarries, entrepreneurial initiatives connected to Aeolian and biomass energy are increasing. These mountain areas have great demand for various tourist and recreational activities; hunting, fishing, gathering of mushrooms and wild berries, and fresh air are increasingly valorised. Greed for the lands increases if property rights over those lands are not exerted and «felt» on the outside. The communities' property rights are also at stake when they depend on external support, regulated by law but seldom applied, when the fire brigades – dependent on the State – are not organized and do not take action in time. Moreover, being co-managers that do not manage, the property rights of the communities are also at stake. They do receive a larger percentage of the timber-related incomes, but the co-management with the State doesn't go beyond that, since they never know how much, how or when.

The management modality of the communal lands in northwest Iberian Peninsula is linked to other factors equally important for their future, such as participation, property rights, and the contribution for local rural development. The evaluation of the management alternatives was useful to deep in the reflection of this complex array of factors. A collective patrimony may seem, at first, an irresistible call for the participation of the members of the communities owning the communal lands. But the participation is in fact low, both in quantity and quality. It is now clear that if the communities persist on this trend, they will be sooner or later replaced. However, if the commoners are able to mobilize and organize their communities, they have the conditions to successfully manage their communal lands.

The number of comparisons each stakeholder had to draw, although time-consuming, was adequate for the exercise and did not prevent an interested participation. The high number of comparisons usually needed is considered to be a limitation of the AHP, since a large number of comparisons may be too

costly and tedious (Kangas 2005). Another problem with the application of AHP, this one being felt during the interviews, is that the scale used for the comparisons does not allow for the expression of any hesitation regarding the alternatives (Alho and Kangas 1997). More advanced techniques for AHP have been developed to lessen this kind of problems, although the basic concept and the ways of employing the methods have remained similar (Kangas 2005).

5. CONCLUSIONS

1. The management models already existent in the communal lands of northwest Iberian Peninsula do not satisfy the stakeholders, especially the co-management with the Administration, the most widely adopted model. Management by municipalities and by private entities was also disregarded by the stakeholders.

2. Of the five management alternatives evaluated in this study, the stakeholder groups preferred a mixed model, currently non-existing which seems to best reflect the characteristics of the communal lands and current demands of the rural world.

3. The unequal relationship between communities and the State (co-management modality) disrespects the law, undermines participation and represents a serious threat to the commonlands property rights reconnaissance and exercise.

4. The basic idea of performing pair-wise comparisons, as being a pedagogical and intuitive approach, has proved to be practical. The method was appropriate to the objectives, although the small number of respondents did limit the legitimacy for decision-making.

6. LITERATURE CITED

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TABLE 1
DESCRIPTION OF THE FIVE MANAGEMENT ALTERNATIVES ASSESSED IN
THIS STUDY

Management alternatives	Description
A1. Communities	Direct management by the communities owning the commonlands. One of the management modalities currently existent.
A2. Municipalities	Municipalities had, especially from 1950 to 1960, an important role on the life of the commonlands, considered to be their patrimony during the dictatorships of Franco in Spain and of Salazar in Portugal. It is not such a remote past as to be forgotten and many municipalities still show interest in recovering the use of their many former hectares
A3. A1+State	Co-management by the communities owning the commonlands and the State, where management decisions are made by the State. The other currently existent management modality.
A4. Private	The presence of private organizations in the life of commonlands is mainly related to forestry-related services (mainly projects and application to financial support, but also forestry operations). In some cases there are also paper-mill (cellulose) industries which pay rents for the lands they use as plantations. Communal lands are also an interesting opportunity for privates in the areas of renewable energies, tourism and sports.
A5. Mixed	Co-management by the communities and the State, where the commonlands are grouped in units of adequate dimensions. The group of commonlands thus formed would have a directive board with equal representation of both parts and professional managers.

TABLE 2

THE OBJECTIVE HIERARCHY FOR THE COMMONLANDS IN NORTH
PORTUGAL AND GALICIA

Aim	Criteria	Sub-criteria
Local rural development	Social and cultural	Job generation Communitarian uses/cultural patrimony New uses
	Economic and management	Forestry production (wood) Non-wood forestry production Diversification of income sources
	Environmental	Soil and water protection Arborisation Biodiversity conservation Preservation of landscape values/open space

FIGURE 1

DECISION MODEL FOR THE MANAGEMENT OF COMMONLANDS.

LEVEL 1=MOST_GENERAL OBJECTIVE OF MANAGEMENT.

LEVEL 2=STAKEHOLDER GROUPS. LEVEL 3=DECISION OBJECTIVES

(CRITERIA). LEVEL 4=ALTERNATIVE MANAGEMENT MODELS

FIGURE 2

THE PAIRWISE COMPARISON MATRIX

FIGURE 3

FINAL ASSESSMENT OF THE MANAGEMENT ALTERNATIVES BY ALL THE
STAKEHOLDER GROUPS

FIGURE 4

WEIGHT OF THE SUB-CRITERIA FOR THE FINAL ASSESSMENT OF THE
MANAGEMENT ALTERNATIVES BY EACH STAKEHOLDER GROUP

FIGURE 5

FINAL ASSESSMENT OF THE MANAGEMENT ALTERNATIVES BY EACH
STAKEHOLDER GROUP

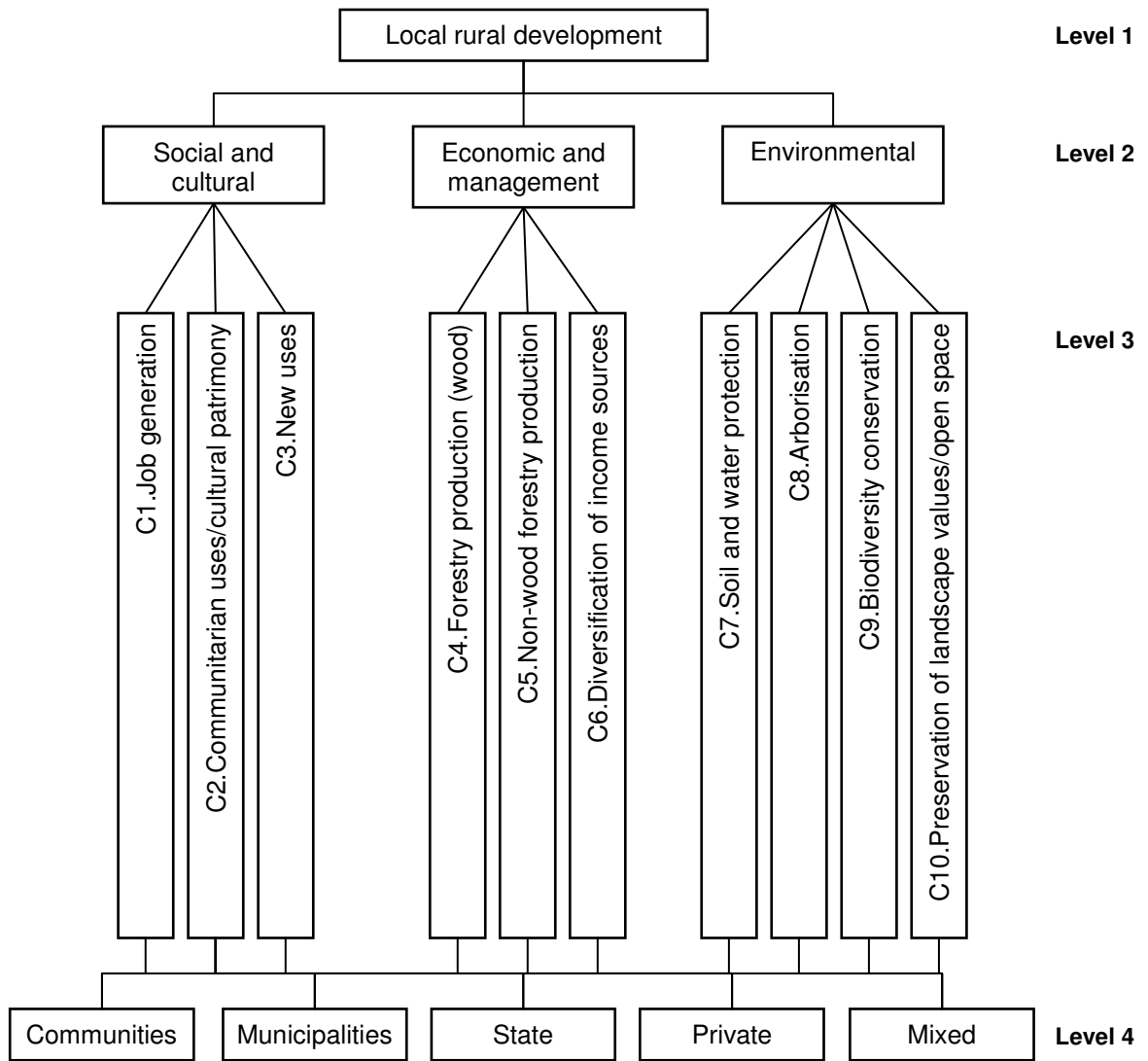


Figure 1

→	A1	A2	A3	...	An
A1	b_1/b_1	b_1/b_2	b_1/b_3	...	b_1/b_n
A2	b_2/b_1	b_2/b_2	b_2/b_3	...	b_2/b_n
A3	b_3/b_1	b_3/b_2	b_3/b_3	...	b_3/b_n
...
An	b_n/b_1	b_n/b_2	b_n/b_3	...	b_n/b_n

Figure 2

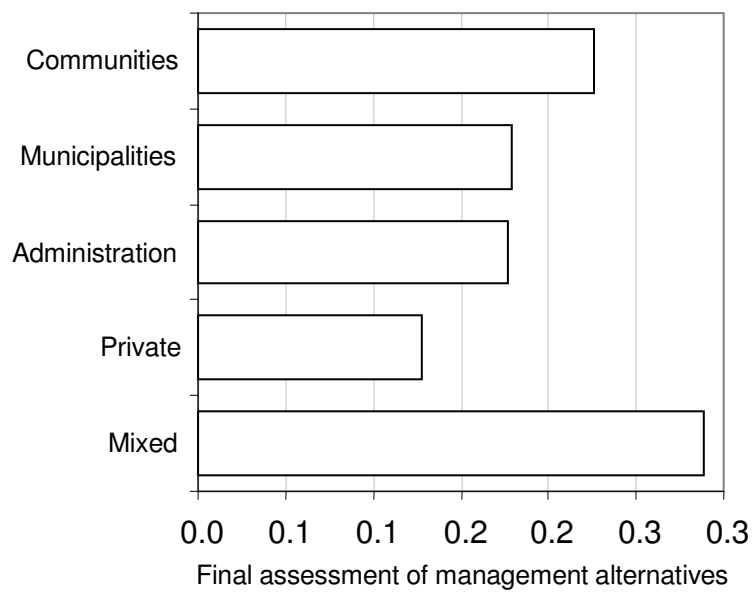


Figure 3

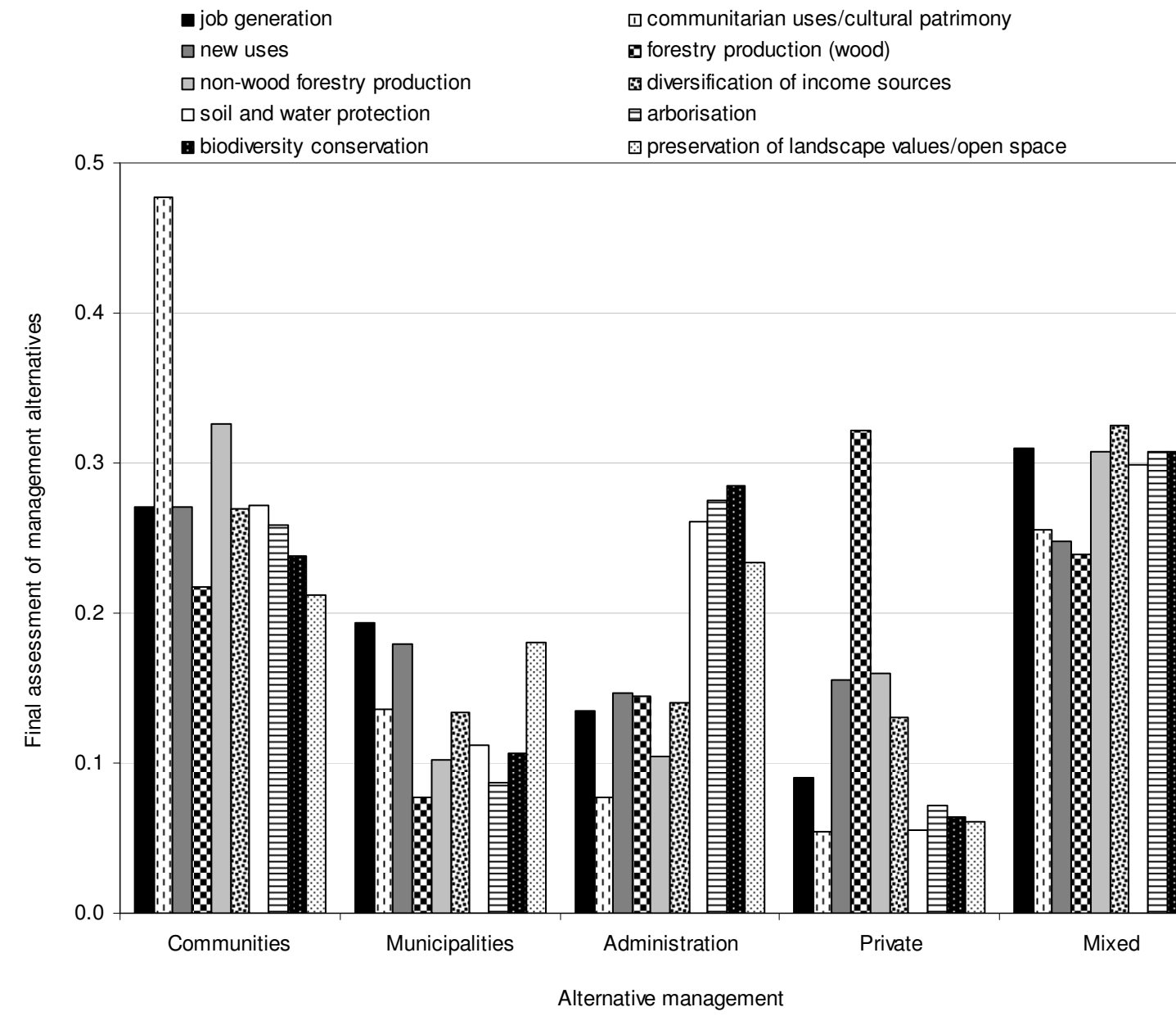


Figure 4

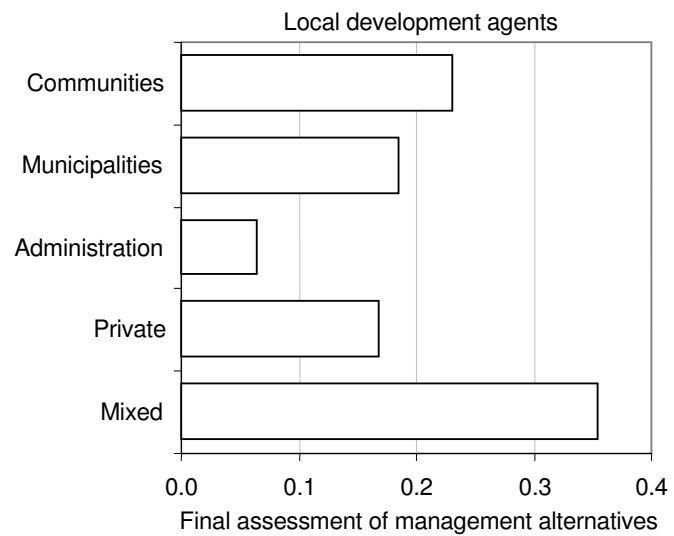
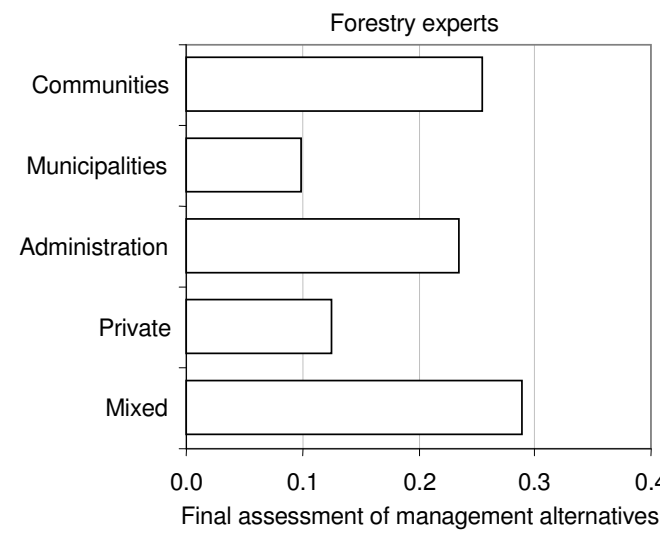
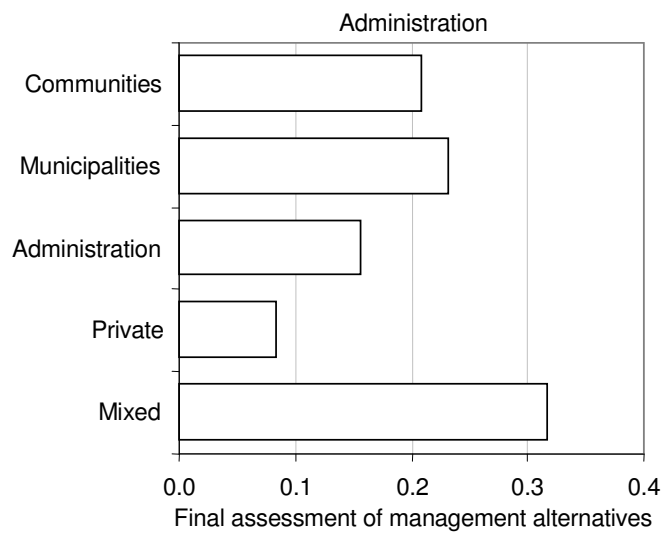
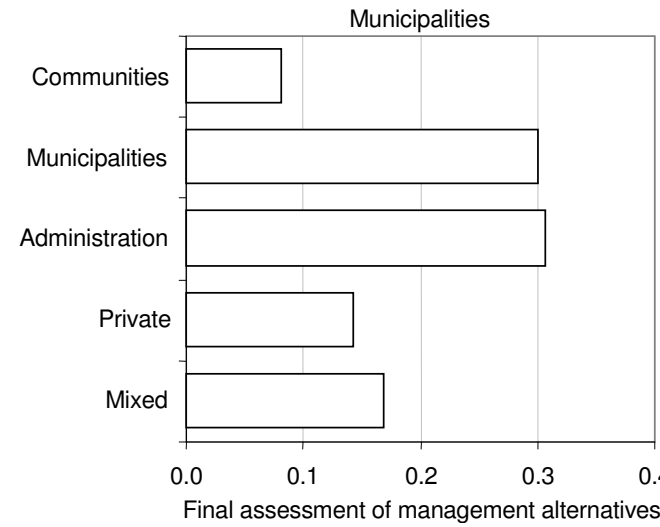
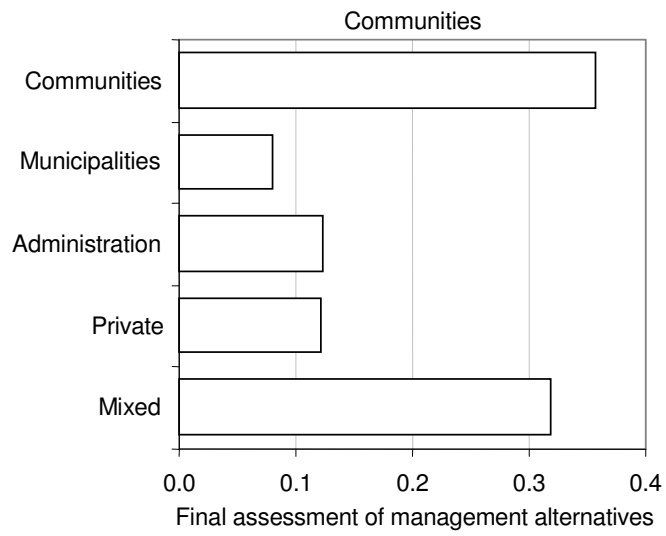


Figure 5