

New Insights into the Assessment of Protected Areas – Integrating Rural Development

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1. Introduction

It is widely acknowledged that the main purpose of designating protected areas (PAs) is the resulting environmental protection obtained. Over the last few years, however, socio-economic aims have been incorporated into the wide range of objectives pursued by PAs. While this incorporation has been occurring the prevailing vision of PAs has also been evolving, from a protectionist one to a wider territory-based one. So an integrated approach involving both PAs and the socio-economic development of their environs has been a growing feature of rural policy (see IUCN, 1998; OECD, 1999), to such an extent that PAs have become valuable tools for the promotion of rural development (Buller, 2000).

The new vision of PAs which has emerged from this reinforces local community participation to the extent that it is necessary for both conservation purposes and rural development (Dower, 1992; Wells et al., 1992). In addition, this combined vision is closely linked to a new perspective on rural governance, the most emphasised features of which are working in partnership, community engagement and active citizenship (Woods, 2005). In fact, the theoretical approach to the evaluation of public policies has shifted from a technocratic one to participative one.

In economics, however, the standard approach to assessing policies associated with PAs has continued to be based mainly on Cost-Benefit Analysis (CBA). This assessment method reduces a complex reality into an efficiency problem based on a monetary criterion. This in turn leads to the 'commoditisation' of ecosystem services and disregards existing or emergent economic, social and institutional issues related to local communities. So this mainstream economic approach does not result in a complete assessment of PAs even though it has been employed in a huge number of real-world cases.

This chapter argues that the PAs assessment framework should emphasise two important properties which are often disregarded, namely integration and participation. The implementation of such a dual approach permits the inclusion of rural development issues within current debates about PAs.

The main theme of the chapter is developed as follows. Section 2 describes the prevailing economic PAs valuation framework which measures benefits and costs. In Section 3 this method is critically analysed in relation to three issues: environmental sustainability, the

economic performance of local communities, and governance and participation. The arguments for integrating rural development into the assessment of PAs are set out in Section 4 while Section 5 proposes an innovative assessment framework based on an integrated and participative approach – the so-called Social Multi-criteria Evaluation (SMCE) approach. Section 6 describes a real-world case study using SMCE in a Natura 2000 (N2000) site in the Basque Country (Spain) and the chapter closes with a few concluding remarks.

2. The economic valuation of PAs

2.1 Benefits and costs of PAs

It is widely recognised that PAs have positive environmental effects. In addition to the environmental gains derived from conservation, other benefits are associated with PAs, including those associated with the rural development objectives listed below. Conservation policies, however, also involve costs, which are relatively high though public budgets reflect only a fraction of them. Both the benefits and costs of PAs have been exhaustively discussed by a number of authors (see e.g., Dixon and Sherman, 1990; Kushwah and Kumar, 2001). Although benefits are classified in various ways, corresponding to differences in the criteria and objectives related to each type of PA, those mainly associated with PAs can be identified as follows:

- a. *Environmental benefits.* These are the principal benefits expected to result when an area is protected. They include, for instance, watershed protection, soil conservation and the conservation of biodiversity.
- b. *Recreation, tourism and rural development.* Public use is generally one of the main objectives of PAs. Tourism is also related to rural development since it provides revenues for local people. Protection programmes have an important socio-economic relevance in many rural areas and have accordingly been included in rural development plans.
- c. *Education and research.* PAs can be used for both research and educational activities because they usually contain good environmental practices.
- d. *Consumption benefits.* Traditionally these have been derived from agriculture, cattle rearing and forestry (and the corresponding production of food, forage, timber). PAs, however, may impose different degrees of restrictions on such activities in order to prevent environmental damage.
- e. *Non-consumption benefits.* These include aesthetic, cultural and historical benefits and, unlike consumption benefits, they are not derived from direct use. But the most essential of non-consumption benefits is 'existence value' (Turner et al., 1994), a quality which includes natural resources. Value can be derived from the mere existence of a site independently of any direct present or future use.
- f. *Future values.* The protection of certain areas can produce a number of benefits (consumption or non-consumption) derived from their potential use in the future. This concept has also been denominated 'option value' (Garrod and Willis, 1999) insofar as people may hold the option of using the PA in the future.

Within a formal economic appraisal all these benefits can be measured as use values or non-use values to arrive at an aggregate measure of value, Total Economic Value (Turner et al., 1994).

On the other hand, a number of costs are also incurred as a consequence of designating and managing a PA. The level of these costs depends to a great extent both on the conservation measures taken and on the economic activities developed within the PA (Barreiro et al., 2004). Following Dixon and Sherman (1990) three main types of cost can be identified:

- a. *Direct costs*. These costs take the form of direct outlays, being directly related to establishment and management of PAs. They are usually incurred by Governments and comprise a variety of categories of costs, including owning the site, site facilities, staff costs, protection programmes and so on.
- b. *Indirect costs*. These refer to the adverse impacts of the establishment of PAs, including damage to property or injury to people by wildlife. Quite significant damages can arise from activity and use restrictions within PAs (forestry, for instance) and these usually require economic compensation for local people in order to offset potential losses.
- c. *Opportunity costs*. These costs represent the potential benefits that society or individuals lose due to the protection of a site rather than the utilisation of its resources in other ways.

After identifying both benefits and costs comes the problem of their economic valuation. Converting both benefits and costs of a PA into monetary terms meets a number of methodological constraints. This is basically because there is no market in which environmental assets are valued, and so they cannot be assigned a definite price. In fact, many environmental goods fulfil the two conditions of public goods: non-rivalry in consumption and non-excludability either by producers or consumers. So environmental goods, such as air quality, visual amenity benefits, and flood protection are public goods and, as such, may produce welfare benefits but have no market value. They therefore produce non-market benefits and that complicates their economic valuation.

In environmental economics several methods have been devised to deal with this issue. Despite their limitations, Contingent Valuation (CV) and Travel Cost have been the two methods most employed in empirical work to get around the valuation problem. Hedonic Pricing has also been used but to a lesser extent. These methods have been used to estimate the recreational value of PAs (Garrod and Willis, 1999; Hanley and Barbier, 2009). CV has also been widely employed in research aimed at revealing a wider range of benefits, such as non-consumption benefits (non-use value), and therefore allocating a specific value to particular PAs.

The CV has been the method mainly used to value welfare gains derived from habitat protection. The concept of Choice Experiment (CE) has recently surpassed CV in importance since it is methodologically more advanced (Hanley et al., 2007). Both of these calculation methods are labelled as Stated Preference (SP) methods since, to estimate them, a sample of respondents is asked to place values on environmental assets in a hypothetical market. In this procedure respondents are asked what is their willingness to pay (WTP) for a positive environmental quality change (or willingness to accept (WTA) a negative one). In this context protecting a site could be regarded as a positive environmental quality change.

Those methods are firmly rooted in the theoretical foundations of CBA and welfare economics. However, problems associated with SP methods have been highlighted by several authors (Hanley and Spash, 1993; Hanley and Barbier, 2009). These problems are generally ones of bias which may lead to differences between the prices derived from applying the cited methods

and the 'true' values of PAs. Systematic overestimation or underestimation may have various causes, including strategic bias, questionnaire design bias, cognitive biases, and hypothetical and context biases. Related but different problems have also been identified regarding the valuation of biodiversity benefits (Hanley et al., 1995).

Nevertheless, different compilations of real-world case studies (see e.g. Nunes et al., 2003) have shown how a particular monetary value may be assigned to PAs. One can note the wide range of values that the WTP may assume, depending on the site as well as on the relevant difference existing in each site between the minimum and the maximum WTP estimate.

2.2 CBA: A monetary assessment framework

CBA has traditionally been the principal assessment framework used in economics to assess PAs. The idea behind CBA is the comparison between the gains (benefits) and losses (costs) that a particular project or policy, such as the designation of a PA, may produce for society. Where possible, the effects of a project are measured as the individuals affected would measure them. Thus, individuals' preferences are measured as social preferences. Both benefits and costs, however, are relative as they are concerned with people's wellbeing.

CBA has its foundation in welfare economics. The principle underlying the theoretical foundation of CBA is that if 'winners' from a particular project or policy can hypothetically compensate 'losers' and still have some gains left over society as a whole is better off (and *vice versa*). This is known as the Kaldor-Hicks *compensation principle*, which is consistent with Pareto improvement since 'losers' (once compensated) are indifferent between the existing and the modified state while the modified state is preferred to the existing state for 'winners' (as long as they can over-compensate).

Benefits and costs that may occur over time are calculated in the form of Net Present Value (NPV). Both positive and negative effects generated over time by a particular project must be taken into account at the present time, when a decision is taken. The CBA decision-rule for accepting the proposed change, then, is a positive NPV as defined in Equation 1:

$$NPV = \frac{\sum_{t=1}^T (B_t - C_t)}{(1+r)^t} > 0 \quad (1)$$

where B_t and C_t are, respectively, benefits and costs in year t , T is time-horizon, and r is discount rate.

If the NPV is negative the project will not be undertaken; it must be positive for the project to be accepted. When only a single real-world case is assessed, decision-makers should simply accept or reject the project depending on its NPV (that is, they should follow a cardinal criterion). But when several alternatives are assessed (all of them with a positive NPV) the choice should be made on an ordinal basis, projects being ranked according to their NPV. In either case, the CBA decision-rule only works under conditions of *strong commensurability* (Munda, 1996), that is, all gains and losses underlying a given action can be transformed into the single composite monetary measure of NPV.

Discounting the future is a matter of great debate among economists (see e.g. Hanley and Barbier, 2009). Usually a lower weight is given to a benefit or a cost in the future than in the present, giving rise to the practice of discounting. Discounting is how economists take account of changing preferences for costs and benefits over time, and hence the discount rate (r) is a means of revealing time preference. Referring to Equation 1, the future must be discounted in order to obtain a present value, and that rate depends on society time preference (how much the present is favoured over the future). The longer is a project's time-horizon (the higher is T) and the greater is society's preference for the future (the higher is r) the lower will be the NPV.

CBA has been used as an assessment framework in many different environmental policy areas. It has been employed for assessing environmental global effects such as ozone damage and global warming as well as issues of local concern like water quality improvements, the reduction of lead in gasoline, the control of nitrate pollution and the evaluation of forest practices codes. In the USA it has been employed for evaluating policies mainly since late 1970s¹, being extensively applied after President Reagan's Executive Order 12291 in 1981 for evaluating new regulations. In Europe a more recent legal framework, the 1995 Environment Act in the UK, envisages the widespread employment of CBA in policy-making. In the European Union (EU) context, the Water Framework Directive (2000/60/EC) also addresses the use of CBA to evaluate public projects.

In the PAs policy arena, valuing habitat protection has become a common way of valuing the benefits derived from protection and contrasting them with the costs of conservation. Research in England regarding the implementation of protection programmes in specific sites reveals that benefits generally exceed costs (Garrod et al., 1994; Willis et al., 1996). The programme for implementing the N2000 network in Scotland was also found to pass a CBA, although it failed when non-use values were excluded (Jacobs, 2004). Nevertheless, in most cases benefits are under-valued compared with costs. While estimating opportunity costs may depend on having data on a wide range of factors, the discovery of both direct and indirect costs of a particular site requires less information and resources. Moreover, in most cases total benefits of a particular PA are higher than quantifiable benefits (Dixon and Sherman, 1990).

3. Critical issues of economic valuation

As noted above, CBA has been widely used in environmental policy evaluation. The main advantages of using it, particularly within the PAs policy assessment context, can be synthesized as follows:

- a. CBA is a well-defined method with firm roots in economic theory, and its results can be expected to reflect the logic of economic rationality. This is a characteristic which is highly valued in the mainstream environmental policy-making context.
- b. Environmental values are explicitly incorporated into decision-making. So benefit-cost trade-offs are made explicit, which is a useful feature in the context of limited resources.

¹ Hanley and Spash (1993) analyze in detail the development of CBA in the USA.

- c. Monetary valuation may be a powerful aid to estimating the appropriate compensation (1) for environmental damage such as oil spills or flooding, (2) for loss of welfare due to restriction of uses and activities in PAs, and (3) for establishing 'payments for environmental services' schemes.

By contrast, CBA possesses certain methodological restrictions – some of them described above – leading to certain disadvantages:

- a. There is a long standing problem of comparing inter-personal utility and aggregating individual preferences into a social welfare function.
- b. CBA is subject to uncertainty due to such problems as the projection of future prices, the unforeseen impact of events on ecosystems and human responses to unexpected shocks.
- c. There is no definitive answer to the methodological problems of selecting a social discount rate or of predicting the preferences of future generations.
- d. The value of the environment defies economic measurement and as a result the CV value reveals a number of biases. The valuation of non-markets goods is also raised as a problem for various reasons, including reliability, validity and transferability (Hanley and Spash, 1993). As a consequence, estimates of biodiversity conservation benefits and costs are said to be too imprecise and incomplete to be useful. Hence, the use of CBA as a comprehensive assessment tool is problematic in most real-world cases (Nunes et al., 2003).
- e. The basic inherent problem of CBA is the fact that project evaluation employs an unambiguous uni-dimensional monetary criterion (van Delft and Nijkamp, 1977; Janseen and Munda, 1999). The fact of converting all attributes concerning PAs (environmental, territorial, biological, socio-economic, etc.) into one single monetary dimension is unacceptably reductionist.

The above limitations do not mean that CBA is inferior to other methods of solving the evaluation problem. But the way in which the CBA framework approaches PA assessment is open to criticisms. Apart from the inherent methodological constraints that any assessment framework may possess, in our view there are three main areas in which CBA is weak when it confronts the task of integrating rural development into the assessment of PAs. These are environmental sustainability, economic performance of local communities, and governance and participation.

3.1 Environmental sustainability

Two important questions with regard to the environment are the extent to which natural capital and reproducible capital (that is, human and human-made capital) are substitutes and what effects this substitution (if it exists) has on social wellbeing. The degree of substitutability between natural capital and reproducible capital is related to the paradigmatic concepts of *weak* and *strong sustainability*. Weak sustainability implies that there is a high degree of substitution between natural and reproducible capital; for instance, roads and infrastructures may compensate for the depletion of environmental quality in producing social wellbeing. Strong sustainability by contrast implies that the loss natural wealth (say, of certain biological species) cannot be replaced by increasing utility derived from using man-made infrastructural investments. This contrast poses such questions as: To what extent should natural capital be substituted by reproducible capital? Does reproducible capital generate enough wellbeing for society to be better off even though

natural capital is depleted? Supporters of the strong sustainability paradigm argue that there is a critical threshold in natural capital beyond which we cannot go².

But the degree of compensation in substitutions between natural and reproducible capital is a key factor in the CBA framework. The question of the sustainability approach calls into question the extent to which the compensation principle can be formalised. CBA can neatly be embedded in the context of weak sustainability since it means there is total substitutability between natural and reproducible capital. Therefore, a trade-off between them, using the compensation principle, makes sense. By contrast, the same reasoning suggests that CBA has to be abandoned in the strong sustainability paradigm because it recognizes no compensating trade-offs between natural and reproducible capital and so the compensation principle is not operational.

In addition to this argument, there are others of a more purely ecological nature which discourage the more extensive use of CBA:

- a. The use of the previously mentioned uni-dimensional criterion is not compatible with strong sustainability. Furthermore, CBA, as we have just seen, supports the weak sustainability position. But when a specific site is designated as a PA it means that the habitat and species living there will be protected 'for ever'. Natural sites are not usually protected only for 10 or 15 years; their establishment implies a long-term vision. Such an approach is associated with strong sustainability as long as no replacement of natural capital is permitted. It is reasonable to conclude that an assessment framework which inherently rejects such substitutability is of no use.
- b. Discounting is another issue related to environmental sustainability. If a particular project causes long-term damage (for example, nuclear dumping, landfill sites, genetic diversity loss, and so on), then discounting will make the present value of such damage low. Specifically, the higher the discount rate the less important the impact of future environmental damage will be. Simply lowering the discount rate can solve arithmetical problems but should not be a solution to environmental ones.
- c. Discounting makes it harder to justify projects that only provide future benefits, such as long-term landscape or environmental benefits provided by PAs. It also encourages current generations from consuming non-renewable resources more quickly to the detriment of future generations.
- d. CBA selects projects on the basis of cardinality rather than ordinality. It takes account of the magnitude of net benefits rather than their importance and that can lead to irreversible environmental damage.

These aspects of CBA may result in harming the way of life of many existing rural communities. As environmental and natural resources, from which many rural people earn their livelihood, are threatened, rural communities could become unsustainable.

3.2 The economic performance of local communities

The role played by local communities with regard to PAs can be seen from different standpoints. An in-depth analysis should be undertaken in order to observe all effects

² This issue is approached more in depth by several authors (Turner et al., 1994; van Kooten and Bulte, 2000).

generated between local communities and PA. In the interests of conciseness we will focus on the economic issues regarding local communities although there are many others.

The effects generated by the benefits and costs of PA described above are highly dependent on the geographical scale used in the analysis. In a large scale analysis the benefits involved are those of the whole society, but using a small scale analysis means only assessing the local community. García (2009) describes in detail how the scale of the analysis affects local communities.

It is generally acknowledged that, while the environmental benefits of PAs are 'captured' by the society as a whole, the costs are mainly borne by local communities. While this statement is generally true, it needs some qualifications. On the one hand local communities may gain some benefits; these include the revenues derived from tourism and public expenditure on the PAs which benefits local people in the form of more employment and better roads, and targeted aids for farming and rural development projects. On the other hand local communities also incur cost increases of two kinds: the loss of income and the need to renounce alternative uses of the land. When those two costs are concentrated on a few locations and affect a small number of people their effect can be huge. But, broadly speaking, the greater part of direct and indirect costs falls on the public sector, in other words, on the society as a whole. A well-defined and structured compensation scheme, therefore, will entail significant costs in terms of public expenditure for the public sector.

Nevertheless, the use of CBA casts doubt on the idea that benefits generated by the designation of PAs accrue largely to local communities. In fact, CBA generally neglects the question of equity, which means that its use does not make for fair outcomes (Munda, 1996). The hypothetical compensation that welfare economics predicts does not take into account different income levels and so the benefits and costs which arise do not affect people of all levels of income equivalently. Besides, according to the Kaldor-Hicks compensation principle, the wellbeing gained by society as a whole must be enough to offset 'losers' for a project to be justified. This seems to imply that when these 'losers' are local communities they should be compensated. But whether this actually happens is far from certain. A well-structured and powerful compensation scheme (whereby local people are compensated in relation to opportunity costs) might offset a considerable proportion of the costs incurred by the 'losers'; but as far as we know this is not what usually happens either because public expenditure resources are lacking or because there is insufficient coordination between different public sector actors.

Other empirical studies do attempt to assess the possible socio-economic impact of PAs in their surrounding area even though they have been less frequently used than CBA. For instance, they generally take into account revenues derived from tourism and merchandising, the creation of local employment, and targeted assistance for farming and rural development projects. Several analyses have used this method to value the socio-economic impacts of PAs in terms of their effect on wealth and employment, both from the local perspective (Mills, 2002) and on a regional scale (Duffi-Deno, 1997; Getzner and Jungmeier, 2002). However, there are at least two drawbacks in this approach: first, this assessment framework is mainly focused on the economic performance of local communities but disregards the environmental implications of PAs; and second, it has not included participation of local communities, a subject which has become an important aspect of current public policy evaluation frameworks.

3.3 Governance and participation

The third main factor which discourages more extensive use of CBA as a tool to assess PAs is its model for decision-making. It disregards stakeholders involved in the PA and focuses the decision about whether to proceed with a proposed PA on a judge, briefed by a project analyst. Furthermore, it disregards any participatory involvement, which should be one of the principal indicators of sound governance of a project. The EU White Paper on Governance identifies participation as one of five principles of good governance, the other four being openness, accountability, effectiveness, and coherence (European Commission, 2001). Participation is regarded as an important component of current innovative forms of environmental governance on the grounds that it promotes the legitimacy of governance solutions and so increases their effectiveness while also reducing the cost of policy making (Rauschmayer et al., 2009).

PAs are often good real-world cases of environmental governance in which a number of different stakeholders, scales and institutions interact with each other. The EU-wide N2000 network is a good example of such an interactive system in the context of multi-scale governance. The multi-national EU institutions, the member states and regions, and the local level authorities, all have something to contribute to governance. However, the Habitats Directive (92/43/EEC) embodies an exclusive and top-down approach to governance in this multi-layered community. In accordance with the provisions of the Directive, only ecological criteria and scientific information have been used to designate the areas which compose the N2000 network. Socio-economic criteria have been excluded despite the fact that the definition and establishment of those areas will have significant consequences for local communities. The Directive does not envisage any public participation mechanism in their implementation and development – a decision which is clearly negative for local communities. In fact, the lack of participation has created numerous conflicts in different European countries, including France, Finland and the United Kingdom, leading to drawn-out legal processes and delays in setting up the network (Paavola et al., 2009).

Since conflicts inevitably arise within PAs between biodiversity and natural heritage care they require effective governance (Paavola, 2004). Local communities play a key role in conflict situations and they may show resistance to PA designations. For instance, the forestry sector in Germany showed opposition to the implementation of the proposed N2000 network due both to the lack of economic resources and to insufficient participation (Krott et al., 2000). Thus, increasing the level of participation by local communities is a way of reducing or resolving conflicts (Bergseng and Vatn, 2009). Furthermore, open participation processes where participants can learn from each other can strengthen shared points of view and interests and thereby help to build both increased understanding of the different values of participants and greater confidence in the process itself.

Therefore, good governance is needed to meet effectively the objectives and functions attributed to PAs. This conclusion applies not only to purely environmental objectives but also to others, such as rural development. Evidence from the Triglav National Park (Slovenia) shows the importance that such a participative approach may have on rural development (Rodela and Udovč, 2008). That experience confirms that recognising local communities as key players and prioritizing participation in PA decision-making are important requirements.

4. Incorporating rural development into the assessment of PAs

Two main reasons are given in support of integrating rural development into the assessment of PAs: (a) to place the PAs in a more inclusive perspective; and (b) to meet the need for participation by local communities in order to provide sound governance to the PAs. Those two key ideas lead to an understanding of PAs as systems which coexist and are interrelated in both their ecological and their human aspects. This systemic view is based on both the 'integrated approach' (which stresses multi-dimensionality, trans-disciplinarity and multi-scale analysis) and the 'governance and participation' approach (which advocates multiple perspectives, social learning and institutional analysis). Most of the PAs – particularly those with human populations – consist of so-called ecological and social subsystems, showing the connections and interrelationships among their elements and making up the so-called social-ecological system (Berkes et al., 2003).

The inclusion of multiple dimensions (ecological, economic, social, institutional, etc.) in the evaluation framework allows a much broader assessment of PAs, taking into account multiple issues related to rural development. In addition, *multi-dimensionality*, or the closely connected idea of *trans-disciplinarity* (considering information and data from the standpoint of different scientific disciplines) is a better way to capture the multiple dimensions of PAs. What is required, in Neurad's words, is an 'orchestration of sciences' (Neurad, 1973) to combat the approaches which reduce the analysis to a single-discipline becoming reductionist.

As noted already, the geographical scale used in the analysis is a key issue. Yet, under the integrated view, interactions and interdependencies appear on different scales and this suggests the need for a *multi-scale analysis* as well as a multi-disciplinary one. To give an example, the management of certain facilities in PAs may have relevant socio-economic implications on the local scale (but not necessarily on the regional one) while the conservation of a certain species in a concrete site may influence biodiversity at the regional scale.

Taking into account 'governance and participation' is also necessary for a complete assessment of PAs. First, this is because participatory processes have been widely used as an instrument for including *multiple perspectives* of different stakeholders in regard to PAs (Reed, 2008; Schultz et al., 2011). One of the main reasons for doing this is that it adds to the accuracy and quality of the information used to reach conclusions (Stoll-Kleemann and Welp, 2008). And such multiple perspectives allows the use of different types of knowledge (e.g. traditional, indigenous, scientific) during the participatory process.

Second, *social learning* has become a relevant attribute of participatory processes and environmental evaluation as a whole (Webler et al. 1995; Garmendia and Stagl, 2010). In rural communities it is also important because it is both an instrument during the participatory process itself and a result in the overall assessment.

Thirdly, from an operational point of view there are many additional factors which influence the degree of participation in PA decision-making (Rodela and Udovč, 2008; Bergseng and Vatn, 2009). Those include, among others: the experience of the authorities in leading participatory processes and attracting social actors, and the degree of participatory culture among the citizens. Because of this multiplicity of relevant factors, it is advisable to take account of the institutional peculiarities of each individual place and situation in order

to maximize the potential for participation. Hence, taking into account differences in social organization and institutions is of great importance for the assessment of PAs. The *institutional analysis* should examine such issues as the existing legal framework, the private property regime, the functions and objectives of social organizations and power relations. All this must be appropriately integrated into the assessment.

5. An innovative assessment framework for PAs

It seems clear that the methods belonging to multi-criteria analysis (MCA) evaluation framework can generally be adapted to real-world cases involving PAs. The main methods within MCA have traditionally been rooted in operational research and have been described in depth elsewhere (see Figueira et al., 2005). MCA, however, can be considered innovative in regard to PAs since, so far, there not many real-world examples.

MCA is a useful evaluation framework when there are different alternative projects which can be assessed using multiple criteria, each alternative being evaluated in relation to a particular set of criteria. Another major virtue of MCA is that it can deal with evaluation problems in which various conflicting interests are involved (Nijkamp et al., 1990). For these and other reasons multi-criteria evaluation techniques have been used increasingly in public planning over the last few years:

- a. there has been increasing emphasis on decision-making as a process within institutions using recognised procedures as opposed to conventional 'one-shot' decision-making;
- b. an increasing desire can be noticed in public decision-making to set out all feasible alternatives from which a solution can be chosen, instead of having a single solution dictated technically by an analyst; and
- c. there is growing possibility to include in the analysis some of the effects which are intangible and so incommensurable in conventional CBA.

MCA's attractions in comparison with CBA have been attributed to two general factors (van Pelt et al., 1990). First, MCA is much more flexible: it allows the explicit inclusion of sustainability and is also adaptable to different conditions, allowing, for instance, the evaluation of the interests of different generations by means of different criteria and the inclusion of qualitative information about income distribution issues. Second, MCA avoids most of the methodological constraints, such as measurements and valuation problems, which CBA often encounters in practical applications. Furthermore, MCA has a wider vision than CBA when assessing the effects on environmental amenities such as those provided by PAs. MCA can be seen as a generalized and a more flexible version of CBA because it allows for the inclusion of monetary aspects (Nunes et al., 2003).

For example, several articles discuss real-world cases involving a combination of MCA with CBA (Ciani et al., 1993; Munda, 1995; Strijker et al., 2000). Strijker et al. (2000) develop a simple MCA in which the net result of the CBA is incorporated as one of the two criteria employed for the overall assessment of an ecological network. Their final results are discussed under both MCA and CBA evaluation methods. Ciani et al. (1993) assessed different management alternatives for a particular Nature Park. They incorporated inputs used for CBA into MCA as criteria, concluding that the final results are quite different depending on whether CBA or MCA is employed. Munda (1995) uses a different technique in which economic criteria, such as employment are considered within a multi-criteria

framework; but economic valuation which leads to CBA is not used. As a result, there is no optimal solution but a compromise solution is proposed.

5.1 A participatory and integrated framework for assessing PAs

It is believed that the instrument which most neatly fulfils the requirements for an integrated and participatory assessment of PAs is the SMCE framework (Munda, 2004, 2008). The SMCE's properties are well-fitted to the wide range of PAs' attributes and functions, and it not only takes into account the environmental dimension but also other objectives related to rural development.

SMCE was designed as a multi- or inter-disciplinary approach to situations in which there are multiple objectives as well as multi-dimensional issues. It has been adopted to help solve the problems of decision-making in a complex situation. The SMCE perspective acknowledges that social conflicts usually arise between different stakeholders associated with each alternative. In fact, the SMCE provides systematic information on the nature of these conflicts in such a way that trade-offs are made explicit to a policy-maker.

The main feature of SMCE is the fact that it takes into account the social dimension of the problem at hand. It has introduced to decision-making the concept of *social incommensurability* which denotes the existence of a multiplicity of legitimate values in society (Munda, 2004) and this is reflected in the fact that conflicts in a decision-making context are normal. Thus, public participation is stressed as a necessary but not sufficient component of the evaluation process. Moreover, SMCE allows the employment of different types of knowledge, including that derived from experts, from policy-makers and from stakeholders. The involvement of social actors enriches the evaluation and decision-making process as democracy and the quality of processes are increased.

The SMCE method also promotes transparency. All evaluation processes (and hence their results) may be influenced by ethical judgements introduced either by the analyst or by any of the actors taking part. Compared to CBA, MCA has been criticised due to the opportunities it gives the analysts to include their own value judgements and hence subjectivity when selecting and weighting criteria (van Pelt et al., 1990; Ciani et al., 1993). So transparency about the assumptions used is essential if such problems are to be avoided.

The SMCE process comprises several steps. Figure 1 shows step by step the ideal problem structuring in SMCE, though it is subject to changes according to differences in the circumstances of the real-world cases appraised. In fact, SMCE has been employed in different fields to evaluate projects and policies relating to sustainability, including water supply and management (De Marchi et al., 2000), urban sustainability policies (Munda, 2006), renewable energy production and location (Gamboa and Munda, 2007), the risk of coastal erosion (Roca et al., 2008) and integrated coastal management (Garmendia et al., 2010). There are also practical applications with regard to PAs policy; Oikonomou et al. (2011) emphasized the ecosystem functions in planning and decision-making of a particular PA by means of SMCE.

Both empirically and theoretically SMCE is a valuable decision-support tool which can be used to address sustainability questions. In particular, with regard to PAs the following reasons are given to support SMCE being applied according to the principles underpinning

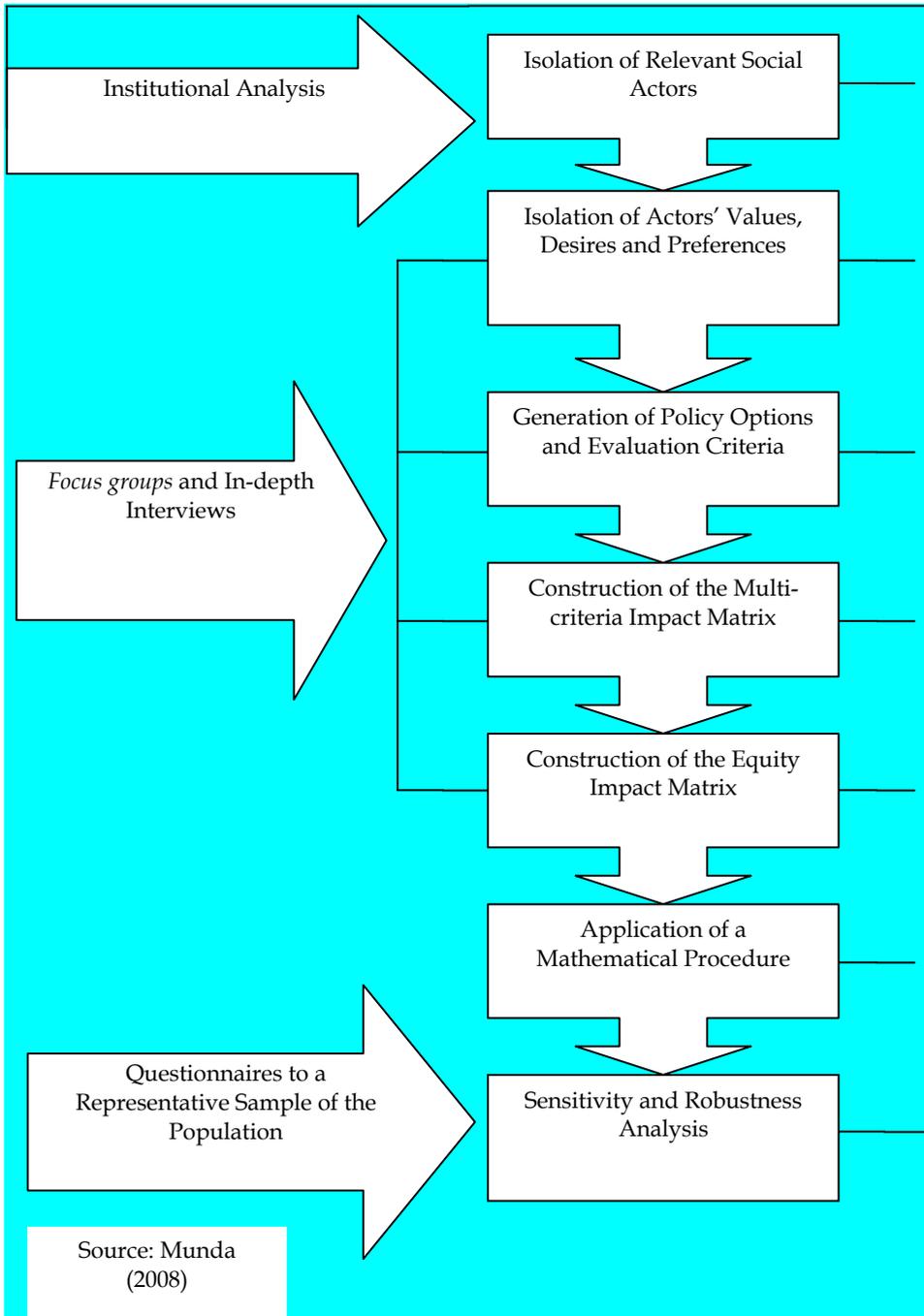


Fig. 1. The ideal problem structuring in SMCE

sustainability. First, PAs imply multi-dimensionality (due to the multiplicity of issues that are generally associated with them); hence a method which employs a multi-criteria evaluation framework such as SMCE should be well-fitted in such a context. The number of dimensions associated with PAs are indeed well-covered by this evaluation framework. And second, SMCE does not, like CBA, employ a single evaluation criterion but several, according to the goals which are set. As a result, the compensation principle is not applied and the method may be much closer to the strong sustainability approach. Both weak and strong sustainability approaches can be addressed in the SMCE framework, depending on the degree of compensability.

It is important to emphasise, however, that SMCE implies *incommensurability of values*, in other words, the absence of a common unit of measurement across plural values (Martínez-Alier et al., 1998). One should note that incommensurability does not imply incomparability, but *weak comparability*. This concept is valid since, on the one hand, comparison is feasible without resorting to a single type of value, and on the other hand, different kinds of measurement are needed to evaluate alternative options. In real-world cases in which different interests confront each other (for example, intensive agriculture *versus* environment conservation) the optimal solution predicted by CBA, for example, does not exist. By contrast, the final result of a decision-making process is a 'compromise solution' among the social actors involved (Munda, 2004, 2008). This statement has been illustrated in many real-world cases by means of SMCE (De Marchi et al., 2000; Gamboa and Munda, 2007; Roca et al., 2008; Garmendia et al., 2010).

6. A real-world case study from the Basque Country

6.1 Overview of PAs policy in the Basque Country

PAs policy in the Basque Country (BC) since the 1990s has placed great reliance on the promotion of Nature Parks. Under the 16/1994 Nature Conservation Act, the number of Nature Parks has increased from two to nine and they now comprise around 10 percent of the territory. The designation of Nature Parks in the BC has had three main objectives: environmental conservation, public enjoyment and rural development. One should note that the second and third of these objectives, taken together, are aimed at strengthening the positive socio-economic effects in areas adjacent to the PAs.

The promotion of Nature Parks has been closely related to rural development policy since 1992, when the first Rural Development Plan was launched in the BC (Etxano, 2009a). Both PAs and rural policy more generally have had shared objectives and functions during the past two decades. In addition, attempts have been made to build a sound relationship between the institutional framework of particular Nature Parks and rural development in their environs (Etxano, 2009b).

The real challenge facing the BC in the realm of nature conservation, however, is the implementation of the N2000 network, the main EU-wide ecological network. 52 Community Sites of Interest (CSI) and 6 Special Protection Areas (SPA) for birds have been designated, and they account for approximately 20 percent of the surface of the BC. As noted above, selected sites have been designated either as CSIs or SPAs exclusively according to scientific and technical criteria on the habitats and species of Community interest. CSIs have been declared according to Annex I (habitat types) and Annex II (habitats

of species) of the Habitat Directive (92/43/EEC) and SPAs have been designated according to specifications under the Birds Directive (2009/147/EC)³. During the last stage of the site selection process, member states have to designate CSIs as Special Areas of Conservation (SAC) within a period of 6 years from their being declared CSIs by the Commission. This period includes the time needed to establish a management plan for the site. Thereby, both SACs and SPAs will shape the N2000 network.

Given this background, there is believed to be some *momentum* in the BC towards finding an innovative design for the assessment framework for PAs, in particular for the N2000 sites. At present much work remains to be done on designing and implementing the management plans for designated sites, so there is an opportunity to incorporate in these plans an integrated and participative assessment framework as a valuable tool in the promotion of rural development.

6.2 A real-world case: The Garate–Santa Barbara N2000 site

The SMCE framework has been put forward as a major support tool for decision-making on the N2000 sites of the BC. A particular SCI, named Garate–Santa Barbara (G–SB), has been selected as real-world case study in order to observe the proposed assessment framework⁴. G–SB is located in the province of Gipuzkoa, between the towns of Zarautz and Getaria (see Fig. 2). The site covers about 142 ha, all of which are under a private property land tenure regime.



Fig. 2. Location of the G–SB N2000 site in the province of Gipuzkoa (Basque Country).

This area is a highly valuable environmental area in the BC because of its endemic biodiversity, including a particularly rare forest in the area based on cork oaks (*Quercus suber*), which are much more abundant in the Mediterranean bio-geographic region. G–SB belongs to the Atlantic bio-geographic region, but the 75 percent of such trees in the BC are found in G–SB and it is the only area in which small forests could regenerate themselves based on this tree species. The site became part of the European list of CSIs in 2004 (code:

³ This is the codified version of Directive 79/409/EEC as amended.

⁴ A detailed description of the real-world case study and its results can be found in Etxano et al. (2009)

ES2120007). The reason for its inclusion in this list is the presence of five types of environmentally valuable habitats as described in Annex I of the Habitat Directive: *Quercus suber* forest; *Quercus ilex* and *Quercus rotundifolia* forest; European dry heaths; endemic oro-Mediterranean heaths with gorse; and lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*).

In addition to its environmental value G-SB has other important values closely linked to rural development in the area. On the one hand, the landscape and recreation values are significant tourist resources for the region. On the other hand, there are economic activities in the area based on forestry, cattle and agriculture. Some of the site's surface is covered by productive forest plantations (of *pinus radiata*, for example) aimed at obtaining economic profit. A few farm-settlements practising cattle breeding can also be found inside the SCI. But the most important economic activity linked to agriculture is the vineyards that produce a highly valued sharp wine known as *txakoli*. This latter sector has grown significantly in the area in recent years. While in 1998 90 ha of vineyards existed in the area, by 2010 this had grown to 400 ha, directly employing 77 people. This increase in wine production has occurred at the expense of a decline in cattle production, a substitution which has led to a marked land use change from grasslands to vineyards. Thus, a conflict arises within the site: conservation of the cork oak forests antagonises the wine producers who are interested in continuing to expand their vineyards⁵.

6.3 Institutional analysis and participatory process

By taking into account the guidelines defined in Fig. 1, the SMCE process can be adapted to the characteristics of real-world cases. So the evaluation process undertaken in G-SB has its own six phases: (1) Institutional analysis; (2) Selection of assessment criteria; (3) Creation of alternatives; (4) Construction of the Multi-criteria Impact Matrix; (5) Application of the mathematical procedure; and (6) Conflict analysis and sensitivity analysis.

The institutional analysis permits a better understanding of the historical roots of the site. It also encompasses the identification of social actors and the definition of the problem at hand according to different perspectives. So the participatory process undertaken is closely linked to the institutional analysis.

The main milestones of the participatory process are described in Table 1. This process involved providing presentations and interviews with various social actors about the issues at stake. Public workshops and individual surveys were also undertaken in a continuous process allowing for dynamic assessment and continuous validation. Moreover, the participatory process included an ample representation of social actors (Table 2).

On the one hand, a major step in the process involved the identification of relevant criteria to assess the site and this was essentially based on the results derived from workshops I and II. Once all social actors' opinions within the participatory forums were analysed eight main evaluation criteria were identified (see Table 3): Landscape quality, Biodiversity, Maintenance of agricultural activity, Income generation, Cost, Recreational and cultural value, Acceptability, and Social wellbeing.

⁵ See Díez et al. (2010) for a detailed review of conflicts in PAs of the BC.

Tasks	Description of actions
In-depth interviews with social actors	Get to know about social actors' discourse. In particular, know about their interests and position on conservation and rural development issues.
Public presentation of the project	Present the project and its participatory milestones to as many social actors concerned as possible. Discuss with social actors possible conflicts identified.
Workshop I: 'Criteria' Workshop	Identify relevant issues for social actors and criteria for assessing the site.
Workshop II: 'Alternatives' Workshop	Contrast results obtained in Workshop I. Identify different scenarios and related alternatives allowed by the current legal framework.
Workshop III: 'Results' Workshop	Present results obtained. Contrast results with social actors' point of view.

Table 1. Milestones of the participative process.

Social actors
<ul style="list-style-type: none"> - Department of Environment and Land Planning. Basque Government. - Provincial Council of Gipuzkoa - Town Council of Zarautz - Town Council of Getaria - Owners: <ul style="list-style-type: none"> • Vineyards landholders • Cattle ranchers • Productive forest landowners • Non-productive landowners - Business Association: Supervising Council of guarantee of origin and quality of Txakoli in Getaria - Farmers' Unions - Ecological/Conservationist Associations - Cultural and Leisure Associations

Table 2. Social actors involved in the participative process.

On the other hand, the creation of alternatives was based on potential future scenarios in regard to the management objectives of the site, its environmental features and the current legal framework. The scenarios were then mapped using Geographic Information System (GIS) tools in order to model the potential environmental impacts of each potential land use plan. In addition to this technical work the different scenarios proposed were discussed with social actors and external experts.

The land use scenarios were then used to identify potential management alternatives associated with the existence or not of payment schemes to landowners. The aim of these schemes is to compensate landowners for changing the present land use to one which will maintain a higher level of biodiversity on the site. According to the current legal framework two types of compensation schemes were outlined:

1. Current compensation schemes ('indirect costs'): established only for forestry, in particular schemes which take into account limitations arising from the slow growth of forest species in N2000 sites;
2. Additional compensation schemes, which at the time did not exist but which were proposed on the basis of existing information:
 - a. Compensation of lost profit ('indirect costs'): compensation given for agricultural activities damaged due to conservation objectives pursued within the SCI; and
 - b. Payments for environmental services: additional payments given for activities and land uses which increase social welfare.

6.4 Integrated assessment

The next step consisted in assessing the suggested alternatives according to the set of criteria defined, which is illustrated in the Multi-criteria Impact Matrix (Table 3). Under an integrative view, each criterion was valued depending on the information available and relying on previously undertaken bio-geographic and economic assessments. Thus, indicators associated with each of the criteria were constructed. Finally, a ranking of alternatives is derived from the resolution of the algorithm allowing the aggregation of all information contained within the impact matrix.

CRITERIA		ALTERNATIVES							
		<i>Status quo</i>	<i>Business as usual</i>	<i>Ecological values Strength Moderate</i>		<i>Ecological values Strength High</i>		<i>Ecological values Strength Maximum</i>	
		<i>Baseline</i>	<i>Scenario 1</i>	<i>Scenario 2</i>		<i>Scenario 3</i>		<i>Scenario 4</i>	
		A01	A11	A21	A22	A31	A32	A41	A42
				Current compen.	Addit. compen.	Current compen.	Addit. compen.	Current compen.	Addit. compen.
Landscape quality	index	10,527	10,590	11,092	11,092	11,928	11,928	15,073	15,073
Biodiversity	index	199	200	218	218	247	247	345	345
Maintenance of agricultural activity	ordinal	5	6	4	2	3	1	5	4
Income generation	Euros	115,838	134,616	118,222	144,000	121,936	148,875	98,547	155,111
Cost	Euros	0	0	3,583	29,361	9,389	36,328	11,106	67,671
Recreation and cultural value	Euros	0	0	3.2 M	3.2 M	3.2 M	3.2 M	0	0
Acceptability	ordinal	5	6	3	2	4	1	5	3
Social well-being	Euros	0	0	47.2 M	47.2 M	102.3 M	102.3 M	228.2 M	228.2 M

Table 3. Example of Multi-criteria Impact Matrix integrating rural development issues.

Biodiversity and Landscape quality were valued by means of indexes elaborated using detailed bio-geographic information. Recreation and cultural value was assessed by a CE valuation undertaken to estimate cultural (non-use) and recreational values. Social well-being was also reduced to a monetary indicator by using the same method. Income generation and Cost were also valued in Euros. However, the former was estimated as

income derived from agriculture, cattle and forestry, including compensation schemes associated with each alternative. The amount of compensation was considered as the Cost since it involved public expenditure in form of compensation schemes. Maintenance of agricultural activity and Acceptability were assessed separately using a parallel multi-criteria assessment. Results derived from each of them were included as ordinal indicators in the Multi-criteria Impact Matrix.

In general, all the evaluation criteria are at least loosely related with rural development as it was interpreted in previous sections of this chapter. Some of them, however, are linked to it more closely. Maintenance of agricultural activity is probably the criterion which best reflects the core idea of rural development. The valuation was based on three indicators that were identified as the most relevant in the participative process: (1) support for agricultural activity, proxied by the total amount of aid received by the agricultural sector in the site (in Euros); (2) the improvement of access roads and infrastructure for farmers and local citizens in the site, in qualitative terms; and (3) the viability of local land management, measured according to the land cover (in hectares) associated with land use for 'commercialised agricultural products'. The larger is the land cover under this form of land use, the greater is the viability of local land management.

Income generation is also an important criterion from the rural development perspective. Average gross margins generated by agricultural activities were used to value it, including those derived from forestry and the production of *txakoli* wine. The amount of compensation was also included as it is part of the total income received by farmers and landowners. In addition, as already noted, Recreation and cultural value are linked to rural development by taking into consideration the revenues derived from tourism. However, in this case a welfare estimate of them has been attempted by means of a CE method; the socio-economic effects of tourism in the G-SB surrounding area, therefore, have not been assessed.

Finally, Acceptability reflects the idea of the preference level of each alternative, making explicit trade-offs between different interests, that is, the winners and losers, for each alternative. This analysis takes place in the context of the present discussion of rural governance and it provides useful information in the search for compromise solutions. So according to the level of acceptance/rejection of each alternative (measured by the number of actors in favour of or against each alternative) an ordinal ranking of alternatives was obtained and fed into the Multi-criteria Impact Matrix.

A main outcome of the SMCE process is the ranking of alternatives reached according to the set of criteria selected. The mathematical algorithm generated within the Multi-criteria Impact Matrix was solved by means of the NAIADÉ (Novel Approach to Imprecise Decision Environment) outranking method (Munda, 1995; JRC-EC, 1996). It can include a mixture of types of information (cardinal, ordinal, and fuzzy) which makes it suitable for multi-dimensional issues and uncertain circumstances. In addition, NAIADÉ allows the degree of compensation between criteria to be adjusted (from completely compensatory to non-compensatory) and hence makes a strong sustainability approach feasible.

Regardless of the final ranking of alternatives obtained, the most important outcome is the existence of integrated evaluation criteria which include measures related to rural development. This real-world case study shows how such integrated evaluation processes can be considered realistic possibilities for the assessment of PAs.

7. Concluding remarks

It has been argued in this chapter that a participatory and integrated assessment framework can produce a full assessment of PAs, including issues relating to rural development. In fact, at least in 'developed countries' such properties are clearly embodied in the currently prevailing visions of both PAs and rural development and governance.

Nevertheless, up to now the majority of real-world case assessments of PAs have relied on an economic valuation approach. The economic criterion is far from useless, but it should not be the only criterion because it possesses an excessive number of drawbacks. In our view the economic dimension should be considered alongside other variables in a multi-criteria framework which reflects complexity and multi-dimensionality of the assessment of PAs.

A useful participatory and integrated framework can be provided by SMCE as has been shown in the description of a real-world case study. The great potential and usefulness of SMCE in different contexts has been demonstrated in a number of other real-world cases. The real-world case study in this chapter has focused additionally on the way in which rural development issues can be integrated into the assessment of an EU N2000 site.

In the whole N2000 network there is an urgent need to establish such assessment frameworks. Generally speaking, the legal framework on which N2000 is based does not envisage participatory governance for such areas. This may lead both to conflicts within local communities and to the non-fulfilment of objectives associated with PAs, especially the rural development objectives. On balance there is some hope that in the near future the spreading use of integrated and participatory decision-support tools may improve these negative situations.

8. Acknowledgments

I am grateful for funding provided by IHOBE (the Basque Environmental Agency) through the research project coded as OTRI 2008.0101 (UPV/EHU) which allowed the real-world case study to be undertaken. I would also like to thank Bob Sutcliffe for his beneficial comments on preliminary versions of this chapter and for his support with language issues.

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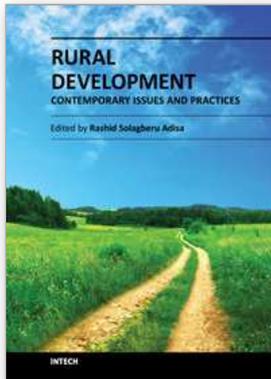
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Rural Development - Contemporary Issues and Practices

Edited by Dr. Rashid Solagberu Adisa

ISBN 978-953-51-0461-2

Hard cover, 408 pages

Publisher InTech

Published online 20, April, 2012

Published in print edition April, 2012

Development of rural areas has witnessed increasing attention globally, especially over the past three to four decades. The highpoint in the renewed global interest in the development of rural people and their environment was reached with the setting of the Millennium Development Goals (MDGs) in the year 2000. All of the set goals are basically rural development goals. With less than four years to the deadline for the achievement of the MDGs, it is almost certain that the goals are far from being achieved in, especially, most developing countries for whom the MDGs were essentially set. The struggle thus continues for rural development. As long as problems of poverty, disease, illiteracy, unemployment, poor infrastructure, environmental degradation and others persist (or increase) in rural communities, better and more result-oriented solutions to perennial and emerging problems of rural communities would be required. But rural development, in spite of the variations in thresholds of rurality among nations, is not exclusively a Third World or “developing countries’ process, owing to its multi-dimensionality. It is a global phenomenon that obviously requires global strategies. This book not only looks at rural development from its multi-dimensional perspectives, it is also a product of the experiences and expertise of distinguished scholars across the continents. Aiming to provide a comprehensive single volume that addresses salient issues and practices in rural development, the book covers themes ranging from sustainable agriculture, biodiversity conservation, strategic environmental assessment, renewable energy, rural financial resources, assessment of protected areas to statistics for rural development policy. Other subject matters covered by the book include social marginality, land use conflict, gender, cooperatives, animal health, rural marketing, information and communication technology, micro-business, and rural economic crisis. The book is thus an invaluable source of useful information on contemporary issues in rural development for researchers, policy makers, and students of rural development and other related fields.

How to reference

In order to correctly reference this scholarly work, feel free to copy and paste the following:

Iker Etxano (2012). New Insights into the Assessment of Protected Areas – Integrating Rural Development, Rural Development - Contemporary Issues and Practices, Dr. Rashid Solagberu Adisa (Ed.), ISBN: 978-953-51-0461-2, InTech, Available from: <http://www.intechopen.com/books/rural-development-contemporary-issues-and-practices/new-insights-into-the-assessment-of-protected-areas-integrating-rural-development>

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