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# PRIORITIZATION OF PUBLIC INVESTMENT IN REGIONAL SPATIAL PLANNING

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## ABSTRACT

The Regional Spatial Plan for the Algarve, approved in 2007, was the first spatial plan made in Portugal which has included an innovative participatory process to support the formulation of the regional development strategy. A Multicriteria Decision Aid (MCDA) approach involving all the relevant public sector institutions and NGO was adopted to identify and prioritize the policies adequate to achieve the proposed Vision. This approach proved to be fruitful in ensuring not only the true involvement of all stakeholders, but also the understanding about the specific scope of each decision area and each set of policies and its operational objectives, but also of the concrete actions/measures that detail each policy. Each policy was evaluated by panels though a series of decision conferences which allowed quantifying the value of the direct and cross impacts of each policy, based on the elicitation of qualitative panel judgements about the relative benefit of those impacts. Also based on qualitative judgements, this decision conferencing process has also included the quantification of the level of 'doability' of each policy, considering technical, financial, institutional, and political constraints affecting their implementation. Finally, a debated formulation of recommendations about the more attractive policies was made, considering the extent to which they contribute to achieve the objectives and their 'doability'. More specifically, the MACBETH multi-criteria approach was used to elicit the qualitative judgements by the experts of the several panels, for each sub-set of policies, and reconcile them to automatically generate two ratings for the policies. On the one hand, a rating designated by impact-value measures the value of each policy in terms of the contribution (of its impacts) to the achievement of each

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objective. These were weighted also using MACBETH in order to reflect their relative importance for the achievement of the Vision, therefore enabling to calculate overall impact values of the policy measures to support the final decision process. On the other hand, a 0 to 1 'doability' rating enabled to the establishment of priorities from the ratio level between the overall impact values and the effort (the complement to 1 of the doability rating) required to implement each policy. The resource allocation process was made by the planning team only after the establishment of priorities, both in terms of budget(s) and agents.
The actions programming (very short, short, medium and long terms) was the outcome of this process.

Keywords: Spatial planning, Public Investment, Prioritization, Multicriteria Decision.

## Introduction

In 2004 the Portuguese Government decided to make a new regional spatial plan for the Region of Algarve. The institution responsible for the plan making process was the Regional Co-ordination and Development Commission of Algarve – the regional extension of the Central Administration at the Region in what concerns spatial planning and the coordination of public spending involving the European Regional Development Fund and the Cohesion Fund (both EU structural funds) by local authorities. The challenge described in this paper was to ensure that the regional development strategy which supports the regional spatial plan [1], its objectives and policy measures result from consensus or compromise among all public institutions and NGO involved in decision making about solutions for the complex planning and development issues, and that policy measures are prioritised in a consistent way.

The several stakeholders or representatives have different views and potentially opposed interests in each decision outcome. A multi-criteria participatory approach was adopted in order to achieve a shared set of objectives, policy measures and priorities.

## Regional Spatial Planning and Public Investment

The making of the regional public investment program faces two different issues which normally arise when the regional strategy attempts to conciliate municipal interests and goals with national and sectoral goals.

Those interests/goals are normally focused on projects and achievements of local focus which regional integration may not exist or depend from the simultaneous validation of other initiatives (both local and national).

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The financial issues, when raised before the setting of the planning and development objectives and policy measures, normally bias its discussion in two ways: they constrain the debate about the strategy to the financial means presumed to be available in the short, medium and long terms; they centre the debate around the sharing of those means between the municipal and national levels and among the institutions of each of these levels. Therefore, the allocation of financial resources should only be decided after the validation of objectives and policy measures.

An efficient regional strategy must set priorities which result from the best compromise among points of view which are necessarily different, and that take into account synergies, incompatibilities, as well as the national and European priorities which may condition it.

## The Regional Participation Process in Plan Making

The first step of the proposed approach was the setting by the planning team of 5 thematic panels, as well as the corresponding initial set of objectives and policy measures. The selected themes were adjusted to the specific scopes covered by the regional plan, its vision and its strategy, as well as to a balanced distribution by the 5 panels of the approximately 100 institutions involved in the participation process. Some institutions were represented in more than one panel. The panels were the following:

Panel A – Environmental Conservation and Biodiversity, Environment, Energy, Water Resources, Agriculture and Fisheries; Mining and quarrying; Agriculture and rural development; Fisheries;
Panel B – Spatial System; Regional infra-structures; Regional social facilities; Transportation and accessibilities; Logistics; Spatial model and land use;
Panel C – Economic base, tourism and heritage; National and European setting;
Panel D – Research, development and innovation; Productivity, competitiveness and connectivity; Entrepreneurship;
Panel E –Economic, Social and Territorial Cohesion; Education and professional training, Health, Security, Culture, Social Exclusion.

Panels D and E were composed by members of the planning team itself, though members of the other panels were asked to make also their value judgements about the policy measures from these two panels, considering their impact across all sectors.

The methodological steps of the participation and decision-making process are depicted in figure 1. The first step consisted of identifying all relevant objectives

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that translate the vision for the Region, as well as the initial set of 89 policies and the measures which are contained in each policy, distributed by the thematic scope of each panel, and considered adequate to achieve the proposed vision.

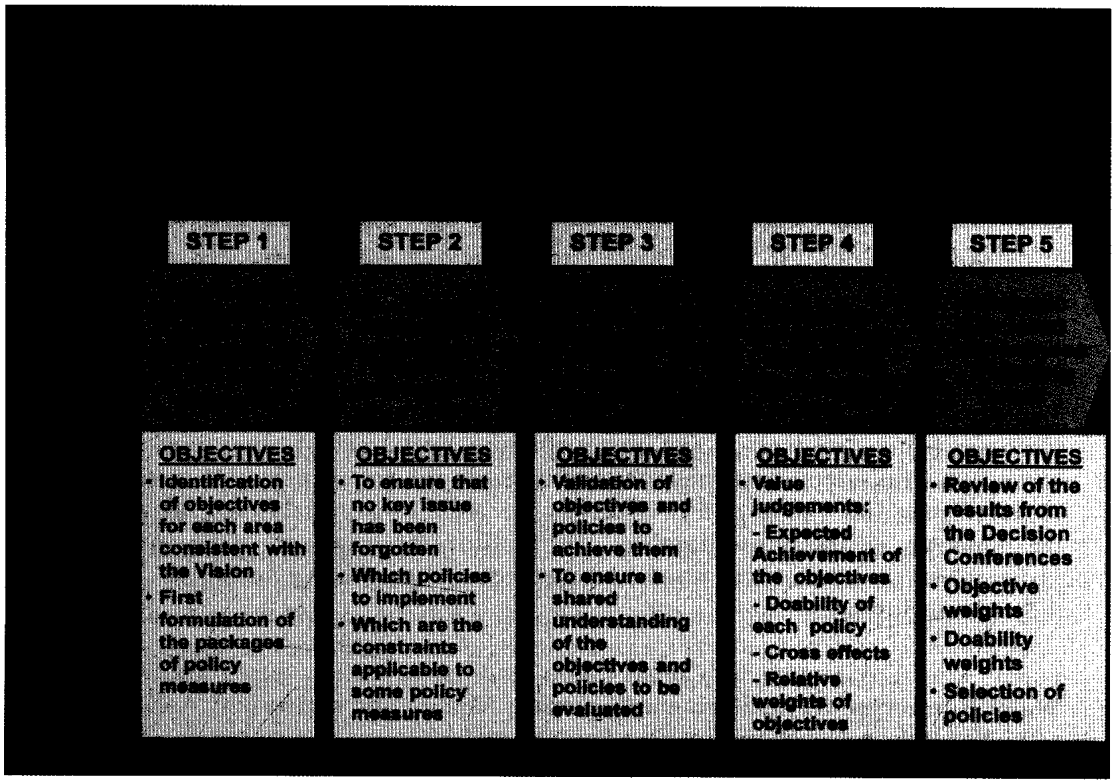


**Fig. 1.** Methodological steps.

In this first step, each member of each panel was asked to confirm if each objective of the set of proposed objectives within the scope of his/her panel adequately describes the future to be achieved, and that his/her understanding is indeed shared by all his/her fellow panel members, taking into account the following:

Each objective should not be neither too general nor too detailed or specific. In the first case it could be equally shared by other panels; in the second case it could lose its validity in the short term and/or the list of objectives would have to be too long. The objectives to be considered should be 'fundamental' (*i.e.* they are ends, not means to achieve ends) and should result from the spatial planning Diagnostic and Vision. Hence, most of the objectives should be policy objectives, thus remaining valid in the long term, beyond the plan validity (10 years).

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The 'horizontal' objectives (shared by more than one theme), namely those concerned with management and institutional issues, are within panels D and E. All the objectives should be clearly stated and independent from each other (as to their content). The description of the objectives may always be improved, thus recommending a debate about their understanding, as well as their justification, whenever required. The leverage or limitations that certain objectives might contain should be identified at this early stage. The objectives are to be detailed at the operational level in the spatial plan.

Each panel member was also asked to confirm if the set of proposed policies within the thematic panel scope accurately describes the most adequate ways to achieve the objectives, and that their understanding is indeed shared by all panel members, considering the following aspects:

The policies are designed to sum up 'sets' of measures and actions. Hence they should not be neither too general, nor too specific or detailed. In the first case they could be considered just strategic guidelines; in the second case they would be the actual actions or projects and the list would be rather long. The policies abide the development and land use planning options presented together with the diagnostic. They should not be mixed with the objectives they aim at, and should be independent from each other (as to their content). Their description may always be improved, thus recommending a debate about their understanding, as well as their justification, whenever required. The leverage or limitations that certain policies might contain should be identified at this early stage. The policies are to be detailed into policy measures and actions of the spatial plan, together with the formulation of its implementation programme.

## Policy Measures

The definition of the policies raises several issues, considering the measures that each policy contains, that are to be overcome by the participation and decision making process: Which policies are more adequate to achieve the Vision, in spatial, social and economic, and in environmental terms? Which are the differences between the different policies in what concerns their expected contribution towards the achievement of the fundamental objectives? Which are the differences between the different policies in what concerns implementation feasibility/doability limitations and risks? Considering the expected impact and doability levels of each policy, which priority level should be assigned to each policy?

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In order to adjust and validate the complete set of policy measures, a strategic analysis of policy measures *versus* fundamental objectives, as well as of a benefit analysis including panel judgements about their value and doability is made. The outcome is the definition of strategic alternatives.

To improve the understanding about the specific scope of each objective and of each policy, each panel had to discuss which are the fundamental objectives and policies, which operational objective(s) detail them and which is the description of the policy and the measures it contains. Following this discussion, a list and description of the concrete potential actions as well as of the expected impact values was produced for each panel. Figure 2 depicts the 5 panels, and sub-panels of A and B (step 1) and the evaluation matrix of all policies according to the expected achievements of all objectives, presented later in this paper.

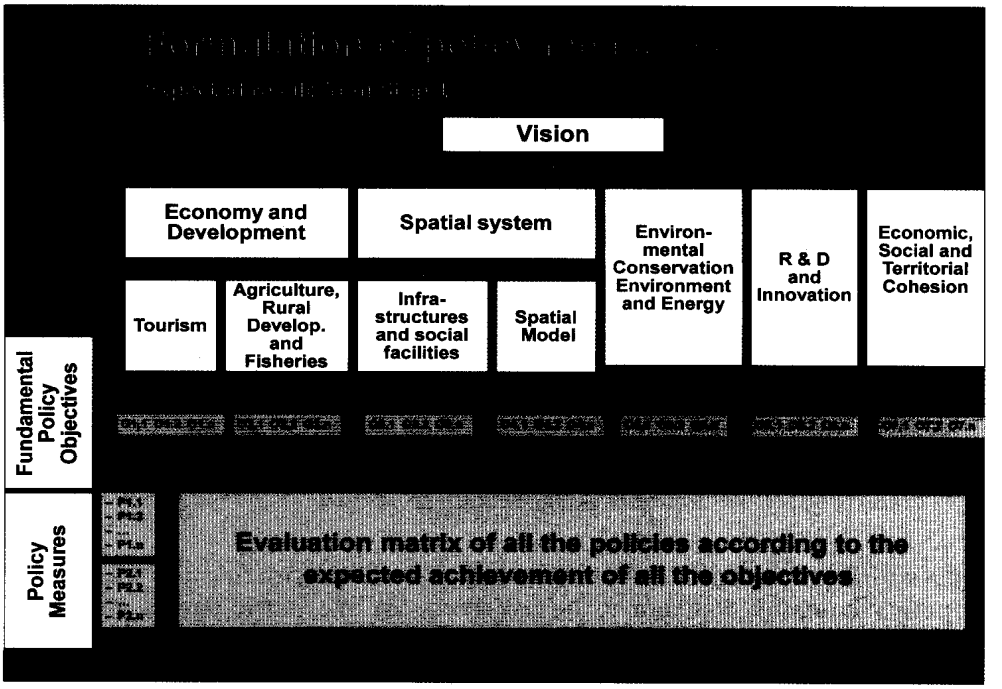


**Fig. 2.** Formulation of objectives and policies.

## The Prioritization Model

The expected achievement of a pre-validated objective by a policy of the same scope and thematic panel corresponds to a direct impact, and is placed in a cell of

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## The Prioritization Model

The expected achievement of a pre-validated objective by a policy of the same scope and thematic panel corresponds to a direct impact, and is placed in a cell of the respective diagonal sub-matrix in the evaluation matrix. The expected achievement of an objective by a policy of a different scope and thematic panel corresponds to a cross impact or effect, and is placed in a non diagonal sub-matrix cell in the evaluation matrix (see figure 2).

A policy may be very effective (high impact value) within its own scope/panel but have little or no impact on other scopes. A policy may have significant impacts on objectives of all scopes. Its overall impact value will vary according to the weighted sum of all impact values and their individual magnitude. The relevance of the contribution from the direct and cross impacts will vary for each policy evaluation, this being of the utmost importance for the later judgment about the priority it should be given.

The evaluation scale for value judgements is the following:

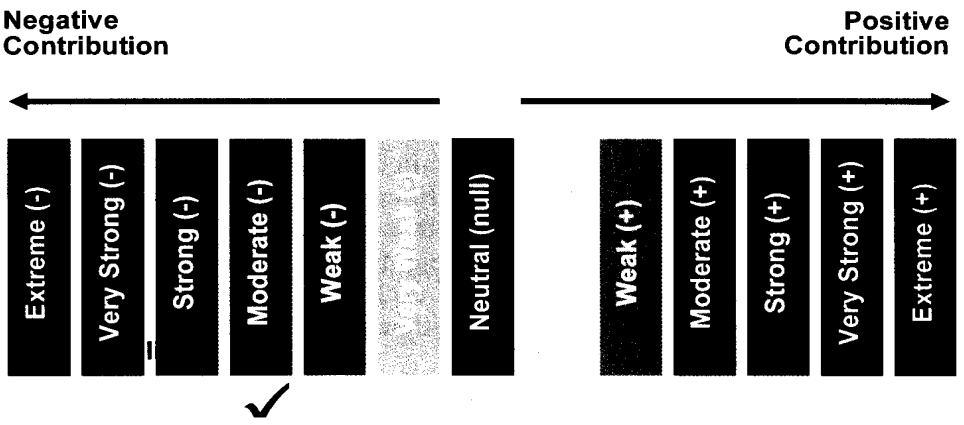


**Fig. 3.** Evaluation scale for value judgements.

The results from these value judgments were produced with the MACBETH voting procedure [2] in decision conferences [3]. The decision conferences where

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from further evaluation as their impact value is considered to be near to neutral. A large dispersion of value judgements of a policy measure implies the need of further discussion among the experts about the reasons for such differences, in order to reduce the divergence of opinions through a new round of voting in compromise value judgments.

Each panel has evaluated the relative weights of the fundamental objectives in order to establish their relative importance within each Decision Area. Each panel also has evaluated the doability of each policy measure. The level of doability of each policy measure is evaluated in qualitative terms, jointly considering its technical, financial, institutional, and political expected feasibility. The debate and formulation of recommendations, considering their overall impact values and their doability, thus helped to identify the more attractive policy measures.

A 'strategic decision conference' involving a limited number of experts from each initial panels was performed. The results from previous value judgments were presented and their dispersion discussed. Conference members were invited to review these judgments in order to attempt to improve the convergence of points of view, thus obtaining the larger possible consensus.

Based upon the qualitative judgements by the experts of the planning team, for each set of policies, the use of the MACBETH method automatically generates ratings for the policy (see [4] for details). Each rating is the impact value of the respective policy for it measures the attractiveness of that policy in terms of the contribution of its impacts to the achievement of each objective. If necessary, the ratings were adjusted.

The relative weights within each Decision Area decided by the panels were scaled so that the maximum 'swing' is 100. A detailed description of the MACBETH weighting procedure can be found in [2]. In order to determine how the 100 weights of each Area compare to each other (in pairs) cross weights were determined by the same procedure. The weights of the objectives within each Decision Area were then scaled, multiplying each one by the cross weight of the corresponding selected objective. The final strategic weights were thus obtained, based upon normalized weights.

The resulting strategic weights are depicted in figure 4.

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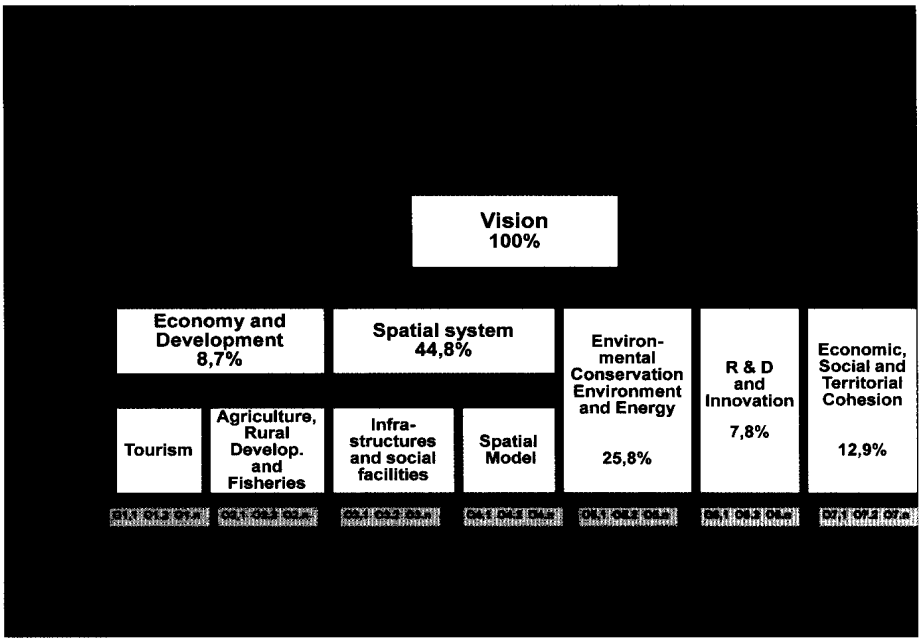


**Fig. 4.** Evaluation of policies – resulting strategic weights.

After the definition of the strategic weights, the overall impact values of the policy measures become available to support the final decision process. The descriptor of the political cost was included in the doability rating of each policy. The mitigation of doability issues may be suggested during the decision conference and its results may be incorporated in the Plan and its implementation program.

## Implementation Framework

The implementation program is the set of all the policies scheduled according to their priorities. This was the last step of adopted methodology, performed by the planning team and no longer the panels.

The clearer way to do it was to consider the ratio between the overall impact value of each policy and the effort involved in its implementation, both of which resulted from the previous step - the decision conferences. The 'effort' is the complement to 1 of the doability rating (with this defined to vary from 0 for a policy seen as impossible to implement, to 1 for a fully implementable policy).

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The determination of resource allocation (budget(s) and agents) may require an adjustment to the former. From the establishment of priorities results the scheduling of all the considered policies in the very short, short, medium and long terms.

The classification which has supported prioritization [2] is the following:

"Pearls" — very beneficial programs (high overall impact values) that have high doability, and which should be of first priority if having high achievement or at least second priority if of average achievement.

"Oysters" — programs of high benefit but difficult to implement because of their high cost or effort involved, which should be considered of third priority. If it is possible to take measures to eliminate the main blockages to its implementation, an "oyster" program can turn out to be a "pearl" program.

"Bread and butter's" — programs with low benefits but which can be easily implemented; they can be important complements to other programs and are interesting to produce some short-term results. These programs rate as a fourth priority.

"White elephants" — programs of low doability and low benefit. These require effort that could be alternatively allocated to implement the "oysters". These should not be implemented as they would consume effort and resources that are much more beneficial if used to implement higher priority programs.

As examples of selected policy measures according to each one of the four levels of priority, the regional spatial plan has considered the following:

First priority – Integrated management of water resources, and the setting of a regional digital network. These two examples show policies recognized to have but very significant direct and indirect impact values, and highly doable.

Second priority - Management plans for Natura 2000 sites, and the renewable energies program. These two examples show policies with a lower direct impact value and doability but considered to have high indirect impact value.

Third priority - Reduction of catchment in fisheries, and integrated coastal management. These policies were considered to have a lower total impact value, and less doable the ones above, even if having a significant direct impact value.

Fourth priority – Spaces for inter-municipal co-operation, and building of the new

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Odelouca dam and reservoir. In spite of a significant direct impact value, these policies were considered to have lower indirect impact value and requiring a high effort/cost (*e.g.* governance and budget issues).

This selection resulted from the combination of thresholds for the efficiency ratio, total impact and direct impact values.

## Lessons Learnt

A large variety of policies has been considered, from policies involving very few measures, these being material project (*e.g.* the building of a dam, reservoir and irrigation system) to policies involving immaterial measures only (such the enforcement of new regulations) or rather horizontal policies, involving measures (material and/or immaterial) which impact several objectives of different decision areas (such as environmental conservation or new digital networks policies). The nature and content of such policies obviously affect the absolute and relative values of their total, direct, and cross impacts as, consequently its efficiency ratios.

The panel members, who are experts in the specific areas of knowledge of their panels, have displayed some difficulty in long term reasoning. Therefore, they tended to minimize the magnitude of long term impacts, especially cross impacts.

The efficiency ratios (total impact value divided by cost/effort) seem to be good performance indicators. However, these may be misleading since they do not necessarily include possible long term impacts, which only are truly known after the required investments have been concluded.

Through the adoption of a strategic thinking attitude, the implementation program should be periodically adjusted or reviewed, moreover because time is a variable which is not explicitly considered in this approach. The value judgments of the expected performance will evolve through time, especially in what concerns programs with relevant long term impacts.

## Conclusion

The approach followed by the planning team proved to be very effective in terms of the formulation and validation of the objectives and of the policies of the regional spatial development strategy for the region of Algarve. The method followed in the prioritization of the selected policies was quite successful in terms of the engagement of all the involved institutions and the promotion of

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convergence of points of view up to the achievable consensus. The final outcome was limited by the difficulty of most panel members in having long term views, as well as in understanding cross impacts. Governance issues have probably biased value judgements in what concerns doability of policies involving high budgets and/or a clear coordination among public institutions.

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