*Anastasia Stratigea
**Chrysaida-Aliki Papadopoulou

Multicriteria Evaluation in Spatial Planning: A Participatory Methodological Approach

Keywords: **spatial planning, participatory planning, scenarios, multicriteria evaluation, NAIADE model.**

Abstract Engaging public and stakeholders in contemporary spatial planning exercises calls for the use of proper tools and methods, which support planners to acquire and manage local information and knowledge (local views, values, attitudes, interests, etc.), increasing thus the effectiveness of both the process and the outcome of planning efforts. The focus of the present paper is on the development of a methodological framework that can accommodate participatory tools at the stage of the evaluation in the planning process. Such a framework can support planners and decision makers to: evaluate alternative scenarios, incorporating multiple perspectives; and explore potential 'alliances' or 'conflicts' among different interest groups, thus improving policy options. This approach is applied to a specific Greek region, where alternative scenarios for its future development were evaluated, following a participatory planning context.

INTRODUCTION

Engaging stakeholders and the public in the decision making process at the local and regional level gains ground in planning exercises, paving the way from technocratic to participatory planning approaches. This places a range of challenges for both: decision makers as to their role in promoting participatory decision making processes; and planners as to their role of 'mediators' in resolving conflicts among different interest groups of local societies (Susskind and Ozawa, 1984; Forester, 1989), but also 'trainers' of local stakeholders and population in new forms of participation, cooperation and social learning (Bruggeman, 2008; Stratigea, 2009).

Adoption of participatory approaches in spatial planning calls for the use of proper 'tools' that provide planners the opportunity to manage, in the most effective way, the knowledge acquired in the context of participatory planning processes. The present paper focuses on the development of a methodological framework, accommodating tools that contribute to the gathering and the effective elaboration of data on stakeholders' judgments, expressed at the stage of the evaluation of alternative development scenarios. Such a framework, aiming at improving both the process and the outcome of a planning exercise, is applied to a specific case study (Herakleion-Crete). More specifically, the proposed participatory framework is based on:

- the use of the Focus Groups as a social research methodology, aiming at the gathering of information on stakeholders' judgments in respect to a range of future development scenarios of a study region. This is used to feed the evaluation stage of the planning exercise with information on the various interests; and

*Dipl. Eng., PhD, Associate Professor - Dept. of Geography and Regional Planning - School of Rural and Surveying Engineering - National Technical University of Athens (NTUA) (stratige@central.ntua.gr)
**Dipl. Eng., MSc, PhD Candidate - Dept. of Geography and Regional Planning - School of Rural and Surveying Engineering - National Technical University of Athens (NTUA) (xpap@survey.ntua.gr)

- the use of a **multicriteria analysis tool** for carrying out the evaluation stage of the planning process. Towards this end, the NAIADE[1] model is used, for further elaboration of judgments gathered in the focus groups discussions. This tool supports both: the ranking of the proposed alternative scenarios on the basis of certain decision criteria; and the exploration of potential 'alliances' or 'conflicts' among stakeholders' groups as to the proposed scenarios, measuring their "acceptability" by the stakeholders' groups.

The structure of the paper has as follows: in the **first part**, the methodological framework is presented, together with a short description of the tools used in this framework, namely the Focus Groups Methodology and the NAIADE multicriteria evaluation model; in the **second part**, the evaluation problem at hand is discussed (Herakleion-Crete region), by means of alternative scenarios, evaluation criteria, impact matrix, stakeholders' groups involved and their judgments as to the alternative scenarios; in the **third part** the empirical results obtained by the application of the proposed methodological framework in the specific case study are discussed; while finally, in the **fourth part** some conclusions are drawn.

THE METHODOLOGICAL APPROACH

The steps followed by the proposed methodological approach are (Figure 1):

- 1st stage: definition of **alternative scenarios**, based on the goals and objectives set for a specific planning exercise;
- 2nd stage: definition of the **evaluation context**, *i.e.* decision criteria, impact assessment of alternative scenarios as to the criteria concerned; creation of the **impact matrix**;
- 3rd stage: preparation of a **focus group** discussion, involving the structuring of the interview guide, the identification of groups of interests (stakeholders) to be addressed in the participatory context based on the problem at hand, the selection/recruitment of participants, the running of the discussion, the gathering of stakeholders' judgments as to the proposed alternative scenarios, and the creation of the **equity matrix**;
- 4th stage: use of the impact and equity matrices as input for the evaluation problem at hand by use of the NAIADE discrete multicriteria evaluation model; and
- 5th stage: ranking of alternative scenarios and assessment of their acceptability among stakeholders; and, based on the above information, formulation of the final decision.

The two tools used in the methodological framework are shortly presented below.

Focus Groups methodology

The Focus Groups (FG) methodology is a promising participatory tool for arriving at policy-oriented assessments. Focus Groups can be described as guided group discussions that are focused on specific topics. The whole process is characterized by its dynamic nature and synergetic effects, resulting in the generation of far more information than in other research methods (Berg, 1989; Stewart and Shamdasani, 1990). It can deal with complex issues, using knowledge from various scientific disciplines and/or stakeholders, so that integrated insights are made available to decision makers (Rotmans, 1998). The whole process is divided into three steps (Stratigea and Papadopoulou, 2013):

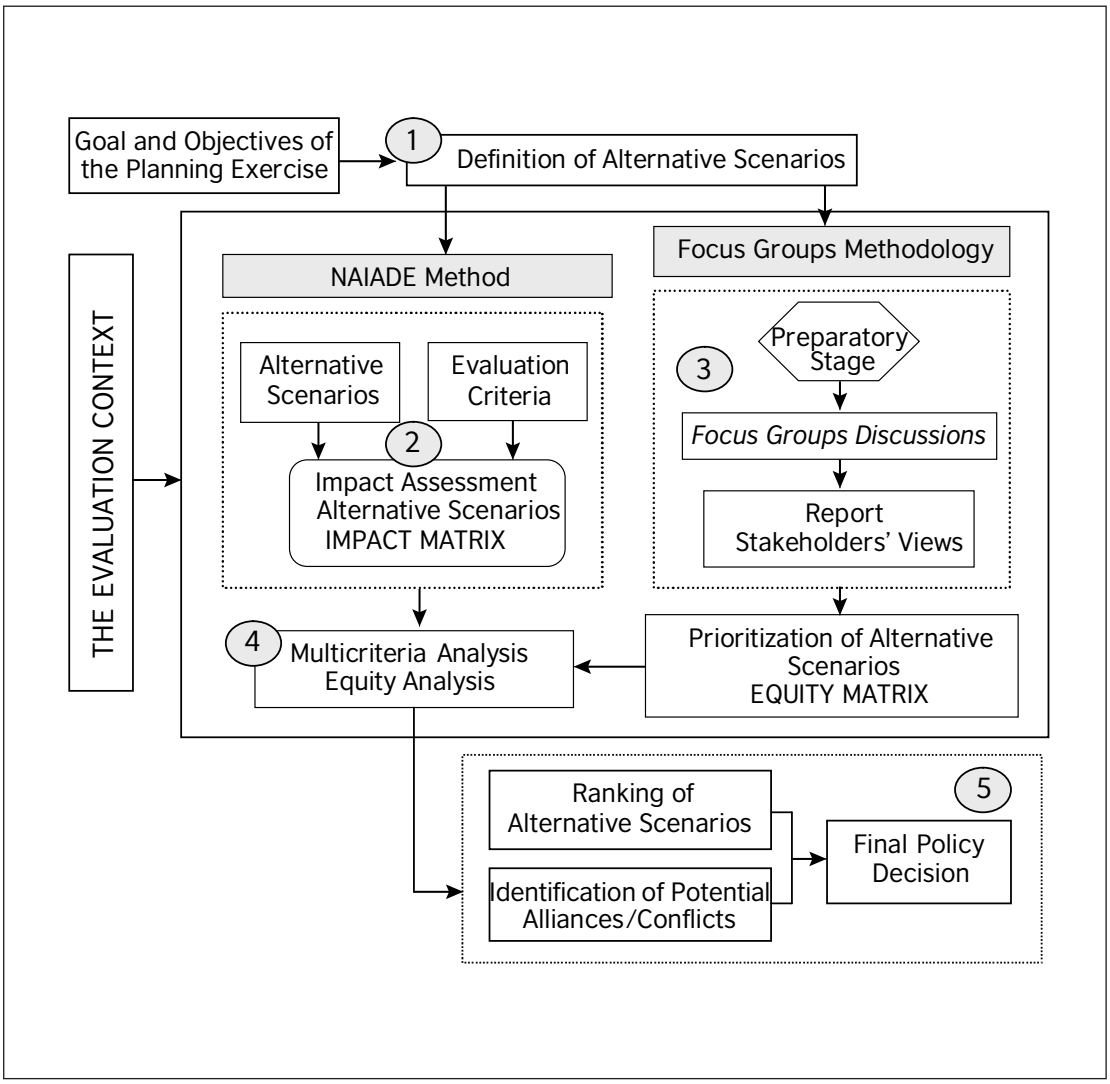
- Step 1 refers to the 'planning' of the whole exercise. At this step, certain decisions have to be made as to the: number of sessions and time devoted to each of them; selection/recruitment of participants; creation of an interview guide to steer the discussion, assuring that all planning issues,

1 NAIADE: Novel Approach to Imprecise Assessment and Decision Environments, Munda (1995)

for which information is needed, are sufficiently covered; preparation of the material to be presented to participants; etc.

- Step 2 refers to the 'running' of the whole exercise, on the basis of the predefined interview guide. It starts with the presentation of supportive material that is properly designed to introduce the issue at hand and challenge participants' discussion and interaction. At this step a range of different views/opinions is gathered, representing the reactions of participants involved in issues raised.
- Step 3 refers to the elaboration of 'qualitative results' and the production of the final report. Various qualitative analysis tools can be useful in this respect (see Stratigea *et al*., 2012).

Figure 1 The proposed methodological approach



Based on deliberately presented inputs and specific rules, Focus Groups can be considered as social experiments, capable of: producing collective judgments, revealing communication barriers, studying conflict behaviour, acquiring local knowledge, creating acceptable options, synthesizing information, etc. (Krueger, 1988; Morgan, 1998). Their key advantage over other participatory techniques lies on

the intensive interaction among participants they introduce, which in turn stresses their importance as tools supporting a 'mutual learning process' for all participants on the specific issue at hand. As a result of this process, new dimensions of the issue at hand can be revealed, thus emphasizing the potential of FG to rather increase insights than produce generalized results (Kitzinger, 1994; Dürrenberg *et al.,* 1997).

NAIADE multicriteria evaluation method

NAIADE constitutes a discrete multicriteria evaluation method, capable of dealing with quantitative and qualitative data. It is a suitable tool for planning problems that are characterized by high uncertainty and complexity as to existing spatial, social and economic structures and respective interrelationships among them (Munda, 2006). The basic input of the NAIADE method is: a set of alternative scenarios to be evaluated, a number of decision criteria for their evaluation and a number of stakeholders, who express judgments for the scenarios at hand. Based on this method, two types of analyses can be carried out (NAIADE, 1996):

- A **multicriteria analysis**, which, based on the **impact matrix**, leads to the prioritization of alternative scenarios as to certain decision criteria;
- An **equity analysis**, which, based on the **equity matrix**, explores possible 'alliances' or 'conflicts' among different interests as to the scenarios at hand. Such information is quite important for planners in their effort to reach a higher level of consensus among stakeholders, assuring thus the more effective implementation of respective plans.

Multicriteria analysis

The NAIADE multicriteria analysis aims at ranking alternative scenarios on the basis of their performance as to certain decision criteria. A range of applications of the NAIADE method can be found in the literature, coping with spatial planning problems, assessment of sustainability, urban contingency policy, water resources management, etc. (see Shmelev and Rodriguez - Labajos, 2009; Torrieri *et al*., 2002; Tiwari, 2007; Soderberg and Karman, 2003).

The basic input of the NAIADE method is the **impact matrix** (criteria/alternatives matrix), incorporating scores that can take the following forms: crisp numbers, stochastic elements, fuzzy elements and linguistic elements (such as 'good', 'moderate' etc.) (Munda, 1995; NAIADE, 1996). In order to compare alternative scenarios, the concept of '**distance**' is introduced. When dealing with crisp numbers, the distance between two alternative scenarios as to a certain evaluation criterion is calculated by subtracting respective crisp numbers. In any other case, the concept of '**semantic distance**' is used, measuring the distance between two functions, via which the scores of the alternative scenarios are expressed.

The ranking of alternative scenarios is based on the data of the impact matrix, which is used for the (NAIADE, 1996):

- comparison of each single pair of alternatives for all evaluation criteria considered;
- calculation of a '**credibility index**' for each of the above comparisons, measuring the credibility of a preference relationship "...alternative scenario 'a' is better / worse etc. than alternative scenario 'b'..." (6 preference relationships are used);
- aggregation of credibility indexes produced at the previous stage, concluding to a ***preference* intensity index** $\mu^*(a,b)$[2] of one alternative 'a' in respect to another 'b' for all evaluation criteria, combined with the concept of '**entropy**' $H^*(a,b)$ as an indication of the variance of credibility indexes;

2 $\mu^*(a,b)$: preference intensity index, emerging from the aggregation of credibility indexes of preference relationships of a and b for all evaluation criteria.

- ranking of alternative scenarios, based on the above information.

The final ranking of alternatives is the outcome (intersection) of two separate rankings: the $\Phi^{+}(a)$ ranking that is based on the 'better' and 'much better' preference relationships; and the $\Phi^{-}(a)$ ranking that is based on the 'worse' and 'much worse' preference relationships.

Equity analysis

The equity analysis is the second step of the NAIADE method. The aim of the analysis is to explore potential 'alliances' or 'conflicts' among groups of stakeholders. For this purpose, the equity matrix is constructed, the elements of which present, in a qualitative way (linguistic expressions), the judgments of stakeholders' groups in respect to alternative scenarios (i.e. different prioritization for each specific group according to own interests). Elaboration of these data results to the calculation of a **similarity matrix**, where the degree of similarity of judgments of each pair of stakeholders' groups (i, j) is presented. Calculations involved in this respect are based on the 'semantic distance' among the judgments of each single pair of stakeholders' groups for each alternative scenario (NAIADE, 1996). The steps followed are:

- structuring of the **equity matrix**, based on a participatory approach;
- calculation of the **similarity matrix**;
- construction of a **dendrogram**, graphically representing potential 'alliances' or 'conflicts' among stakeholders' groups.

The interpretation of the dendrogram can provide planners valuable information in respect to the 'resistance' or 'consensus' reached as to the alternative scenarios evaluated. Moreover, it can provide information on the level of divergence of the stakeholders' judgments as to the scenarios concerned, where a large dispersion of judgments can potentially drive a certain restructuring of scenarios or even of goals and objectives of the planning exercise.

APPLICATION OF THE METHODOLOGICAL FRAMEWORK - THE EVALUATION PROBLEM

In this section, the evaluation problem at hand in the case study of Herakleion-Crete is discussed. More specifically are presented: the key attributes of the study region; the main input to the multicriteria evaluation for the specific case study, i.e. alternative scenarios, evaluation criteria and impact matrix; and the stakeholders' judgments as to the proposed scenarios. These are forming the main input required for the application of the proposed methodological framework.

The study region

The study region is the prefecture[3] of Herakleion, located in the island of Crete-Greece. The region is endowed with valuable natural and cultural resources. During the last decade, its population has increased by 8.7 per cent (and by 50 per cent from 1971 to 2001). The share of urban population is 50 per cent, while that of the agricultural population is 39 per cent (2001). A large number of Research and Higher Education centers are also located in the study region.

In respect to the local economy, it should be noted the prevalence of the agricultural and tourist sectors (Stratigea and Giaoutzi, 2012). The agri-sector consists of small-scale agricultural firms, cultivating mainly traditional products; while, during the last few decades, greenhouse and organic farming are gaining importance. The secondary sector makes a thin contribution to job creation and share of the regional gross domestic product (GDP), mainly based on the: food sector, plastics, agricultural machinery, building materials, as well as local art and clothing products. The service

3 NUTS 3 administrative level.

sector is one of the most dynamic sectors, where tourism, trade, banking and health services are of high importance. It produces 2/3 of the regional domestic product, while employing more than 45 per cent of the local population.

Accessibility to the study region is served by: the Herakleion port, a very important node for both national and international sea transportation in the Mediterranean basin; the Herakleion airport, the largest tourist and trade 'gate' of the Crete region; the northern road corridor, part of the TEN-Transport network; the southern road corridor; and a rather well-developed telecommunications infrastructure.

Alternative scenarios for the study region

Three alternative scenarios are evaluated in the present paper, serving the *goal* of the 'Integrated Agricultural Development' of the region of Herakleion-Crete. The scenarios were structured by means of the MORPHOL analytical method (morphological analysis), taking into consideration developments in both the internal environment of the region at hand and the external environment (settlement pattern, pattern of tourist development, adoption-use of agri-food technology and Information and Communication Technologies – ICTs, developments in agri-food technology, food consumption patterns, etc.). Technology and innovation are considered as key elements in the first two scenarios, while the third one is a trend-based scenario.

The three scenarios have as follows (Stratigea *et al.*, 2008; Stratigea and Giaoutzi, 2012):

Scenario A – entitled '**market first**' scenario – is a market-oriented scenario, where technology and innovation are considered as means to increase efficiency. The local economic structure is mainly based on a technology-oriented very efficient agri-food sector, driven by cost and product differentiation (organic production). Population in the study region shows a rather dispersed spatial pattern, with high-skilled human resources. Mass tourist pattern remains stable, with certain types of alternative tourism to gain ground in the tourist product. ICTs are widely diffused, in support of firms' networking and knowledge diffusion. Renewable energy has increased its share, due to the strengthening of the multifunctional role of the agri-sector, which places emphasis on renewables (management of biomass from agri-residuals) and eco-activities (e.g. agro-tourism). New marketing schemes, based on ICTs, enhance the market share of the tourist sector.

Scenario B – entitled '**environment first**' *scenario* – considers technology and innovation as means towards a more environmentally-friendly future. Environmental culture prevails, while agriculture is considered as the 'vehicle' for preserving nature and developing small-scale eco-activities. The agri-food sector is exhibiting a low technological profile and a high environmental concern. It follows a traditional home-based agricultural development pattern, with small-scale farms, placing emphasis on organic farming and eco-activities. Population exhibits a rather dispersed spatial pattern, with high skill levels. The mass tourist pattern remains stable, mainly concentrated in the northern part of the region. ICTs are highly diffused, serving firms' networking and marketing purposes. A more environmentally-responsible image of the region is promoted, attracting tourist flows and small-scale investments in eco-activities, while renewables are also attracting high interest as a means to preserve local assets.

Finally, **Scenario C** – representing the '**worst-case scenario**' – provides an image of the future, which is characterized by the continuation of existing trends, leading to further concentration of population, the presence of low-skilled labour, and a local economic structure based on mass tourism and trade of agri-products. There is a low/medium diffusion rate of knowledge and technology in the agri-food sector and a low/medium rate of ICTs diffusion. Renewables have partly increased their share, but there is still enough potential unexploited. Ageing of rural population and the low level of competitiveness drive the abandonment of agricultural land, while the agricultural sector is gradually

losing importance at the local level. The development of the region exhibits a polarized pattern, where rural regions are lagging behind with respect to employment and income opportunities, skilled labour, accessibility to basic services, network infrastructure, etc., coupled with the ageing of rural population.

Evaluation criteria

As 'evaluation criterion' is defined "... a measurable aspect of judgment by which a dimension of the various choice possibilities under consideration can be characterized" (Voogd, 1983:57). In the present case study, ten evaluation criteria were used for the evaluation of scenarios A, B and C above (Table 1). These criteria were defined on the basis of the *goal* (Integrated Agricultural Development of the Herakleion region) and the *objectives* of the planning exercise being: environmental protection, regional development, economic efficiency, social cohesion, energy production and quality-safety of the agri-food products; and have as follows:

- Pesticide use – water pollution: pattern of agri-sector development in each scenario (e.g. use of pesticides), resulting to the pollution of water resources;
- Biodiversity – landscape quality: level of biodiversity and landscape preservation by each scenario;
- Accessibility of rural regions: level of accessibility promoted by each scenario;
- Multifunctionality of agricultural land: degree of multifunctionality of agricultural land that each scenario promotes;
- Competitiveness of agri-production systems: scenarios' performance as to the competitiveness of the agri-production system;
- Social inclusion: level of social inclusion implied by each scenario;
- Renewable energy (RE) production: performance of each scenario as to the promotion of renewable energy production;
- Organic farming: level of organic farming development by each scenario;
- Product labeling: quality assurance - potential of each scenario to ensure quality at the various stages of the production chain ('from field to table');
- Preservation of local identity – traditional agricultural production system: level of preservation of local identity by each scenario.

Table 1 Objectives and respective evaluation criteria in the study region (Source: Stratigea *et al*., 2008)

a/a	Objectives	Evaluation Criteria	
1	Environmental protection	Pesticide use – Water pollution Biodiversity/Landscape quality	K1 K2
2	Regional Development	Accessibility Multifunctional role of agricultural land	K3 K4
3	Economic Efficiency	Increasing competitiveness	K5
4	Social Cohesion	Social inclusion	K6
5	Energy Production	RE production	K7
6	Quality-Safety of Agri-food Products	Organic farming Product labeling Local identity – Traditional pattern of agricultural production	K8 K9 K10

Impact assessment of alternative scenarios – Creation of the impact matrix

Based on the three scenarios and the ten evaluation criteria presented above, the **impact matrix** is constructed (Table 2). The values of the impact matrix (scores of scenarios as to the decision criteria) are expressed in a qualitative form (linguistic expressions); and represent the view of the planning team and local experts in the region at hand.

Table 2 Impact matrix (Source: Stratigea and Papadopoulou, 2012)

Alternative scenarios Evaluation criteria	Scenario A	Scenario B	Scenario C
K1-ENV_1	More or less good	Very good	More or less bad
K2-ENV_2	Moderate	Very good	More or less bad
K3-ACCES	Very good	Good	Moderate
K4-MULTI_ROLE	Moderate	Very good	Bad
K5-COMPET.	Very good	Very good	Bad
K6-SOC_INCL.	Moderate	Very good	Bad
K7-RE_ENERGY	Very good	More or less good	Moderate
K8-ORGAN_FARM	Moderate	Perfect	More or less bad
K9-PROD_LABEL.	Perfect	More or less good	Bad
K10_LOC_ID	Moderate	Very good	Good

Stakeholders' view

At this stage, the stakeholders' judgments as to the proposed scenarios are presented. The selection of stakeholders is based on their potential to influence the set of goals and objectives pursued in the region at hand. Ten groups of stakeholders are represented in the Herakleion case study. A Focus Groups discussion was organized, where they had the chance to acquire information on the evaluation problem at hand and express their views and judgments as to the proposed alternative scenarios. Views and judgments of stakeholders are incorporated in an equity matrix (Table 3), used for equity analysis in the NAIADE model. It should be noted that stakeholders' judgments in the NAIADE model can be only of qualitative nature (linguistic expressions).

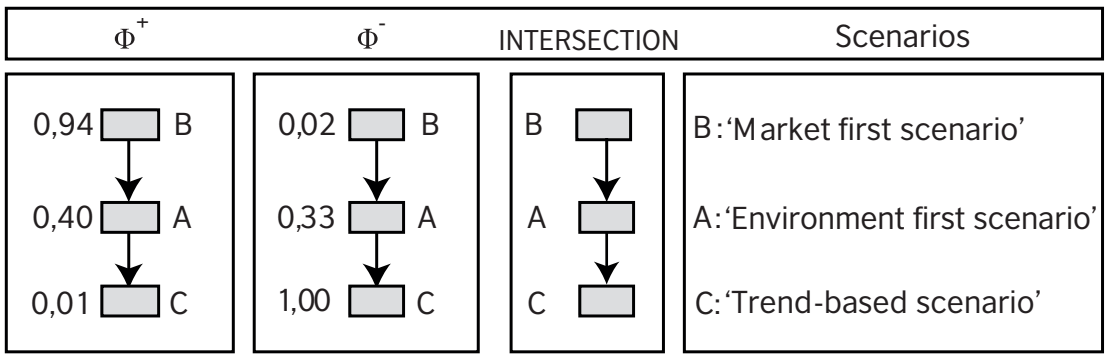
Table 3 Equity matrix – Stakeholders' judgments as to the proposed scenarios (Source: Stratigea and Papadopoulou, 2012)

Scenarios Groups of Stakeholders	Scenario A	Scenario B	Scenario C
1 Environmental pressure groups	Moderate	Perfect	Very Bad
2 Local administrative agencies	Very good	Very good	More or less bad
3 Social groups	Good	Very good	Bad
4 Agricultural cooperatives	Good	Very good	Very bad
5 Scientific groups	Very good	Very good	Bad
6 Manufacturing chambers	Very good	Moderate	Bad
7 Trade chambers	Very good	Good	Bad
8 Tourist sector representatives	Moderate	Very good	Good
9 Road transport companies	Good	Very good	Moderate
10 Sea transport companies	Very good	Good	Moderate

EMPIRICAL RESULTS

In the following, the empirical results from the application of the proposed framework in the region of Herakleion-Crete are discussed. More specifically, in Figure 2 the results obtained by the **multicriteria evaluation analysis** are presented, i.e. the ranking of scenarios, where scenario B ('Environment first' scenario) is the prevailing one, followed at a distance by scenario A ('Market first' scenario), while last and with a comparatively low performance rates scenario C ('Trend-based' scenario).

Figure 2 Results of multicriteria evaluation – Ranking of alternative scenarios (Source: Stratigea and Papadopoulou, 2012)



The results obtained by the **equity analysis** are used to explore potential 'alliances' or 'conflicts' among stakeholders' judgments on scenarios' prioritization. In Figure 3 the process of creation of 'alliances' among stakeholders is presented, at the different levels of agreement. By this is depicted that at the highest level of agreement (0.8849), a certain alliance is created between the stakeholders' groups G2 (local administration agencies) and G5 (scientific groups), while at a lower level of agreement (0.8502), two more stakeholders' groups are added [G7 (trade chambers) and G3 (social groups)]. The lower the level of agreement, the higher is the number of stakeholders' groups that converge on a certain scenarios' prioritization. At the lowest level of agreement (0.7011), all different stakeholders' judgments are converging.

At each level of agreement, a certain **ranking of scenarios** is emerging, emanating from the views of respective stakeholders' groups, reaching consensus at this level. This implies that at the different levels of agreement, scenarios' ranking may change, reflecting the convergence of judgments of different sets of stakeholders' groups. In Table 4, the different prioritization of scenarios as well as the different 'alliances' created among stakeholders' groups are presented at each different level of agreement.

Figure 3 Dendrogram representing the process of alliances' formation

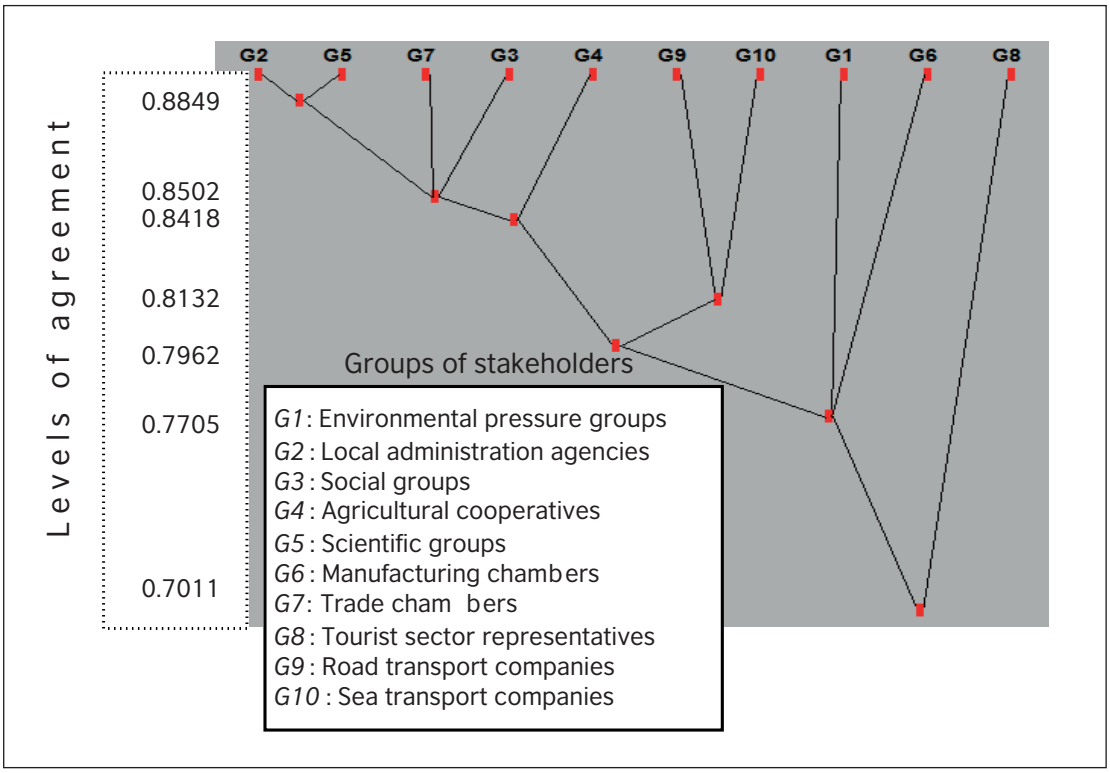


Table 4 Different levels of agreement and respective scenarios' prioritization

	Level of agreement[4]					
	0.7011	**0.7705**	**0.7962**	**0.8132**	**0.8418**	**0.8849**
Ranking of scenarios	B	B	B	B	B	B
	A	A	A	A	A	A
	C	C	C	C	C	C
Groups forming 'alliances' at each agreement level	All groups	All groups except G8	All groups except G8	All groups except G8	All groups except G8 and G10	Only groups G2 and G5

Moreover, in Table 5 results as to the ranking of scenarios at the highest level of agreement (0.8849) per stakeholder or stakeholders' group (in case of alliance) are indicatively presented. From these results, it is shown that a considerable number of stakeholders' groups (6 out of 10 groups - G5, G2, G1, G3, G9 and G4) converge with the ranking of scenarios, as emerging from the multicriteria evaluation (see Figure 3 above) [scenario B rating first (emphasis on environmental protection), followed by scenario A (emphasis on the market orientation), with scenario C rating at the last position (trends-based scenario)]. For three stakeholders' groups [G10 (sea transport companies), G7 (trade

4 Values in (0, 1).

chambers), and G6 (manufacturing chambers)], there is a different scenario ranking, with scenario A rating at first position. Finally, scenario C is ranking last for all stakeholders' groups, apart from G8 (tourist sector representatives), which implies that a certain consensus is reached among the majority of stakeholders' groups on the need for breaking existing trends.

Table 5 Scenarios ranking at the highest level of agreement (0.8849)

G5, G2	G10	G1	G8	G3	G9	G7	G4	G6
B (0.05)	A (0.03)	B (0.00)	B (0.03)	B (0.03)	B (0.03)	A (0.03)	B (0.03)	A (0.03)
A (0.05)	B (0.16)	A (0.50)	C (0.16)	A (0.16)	A (0.16)	B (0.16)	A (0.16)	B (0.46)
C (1.01)	C (0.46)	C (0.95)	A (0.46)	C (0.76)	C (0.46)	C (0.76)	C (0.91)	C (0.76)

Finally, from the equity analysis, the **similarity matrix results**, in which the degree of convergence between each pair of stakeholders' groups is presented, based on their judgments as to the scenarios' prioritization (Table 6). These results allow a more in depth exploration of the convergence of judgments between each pair of stakeholders' groups, where it is shown that the highest level of agreement appears to be between G2 (local government) and G5 (scientific groups) (value of 0.8849), while the lowest level of agreement appears between G4 (agricultural unions) and G8 (tourist firms) (value of 0.5183), reflecting the conflicting interests of the two stakeholders' groups.

Table 6 Similarity matrix of judgments of stakeholders' groups Gi

	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10
G1	1.0000	0.6552	0.7506	0.7705	0.6722	0.5893	0.6557	0.5258	0.6510	0.5978
G2	0.6552	1.0000	0.8299	0.7703	0.8849	0.6759	0.8299	0.5471	0.7962	0.7962
G3	0.7506	0.8299	1.0000	0.8418	0.8405	0.6670	0.8132	0.5515	0.7637	0.7274
G4	0.7705	0.7703	0.8418	1.0000	0.8174	0.6609	0.7847	0.5183	0.6870	0.6657
G5	0.6722	0.8849	0.8405	0.8174	1.0000	0.6789	0.8502	0.5306	0.7470	0.7470
G6	0.5893	0.6759	0.6670	0.6609	0.6789	1.0000	0.7637	0.5686	0.6360	0.7052
G7	0.6557	0.8299	0.8132	0.7847	0.8502	0.7637	1.0000	0.5515	0.7274	0.7637
G8	0.5258	0.5471	0.5515	0.5183	0.5306	0.5686	0.5515	1.0000	0.7011	0.6143
G9	0.6510	0.7962	0.7637	0.6870	0.7470	0.6360	0.7274	0.7011	1.0000	0.8014
G10	0.5978	0.7962	0.7274	0.6657	0.7470	0.7052	0.7637	0.6143	0.8014	1.0000

An in depth analysis of these results can provide useful inferences for planners and decision makers in the study area, as to potential strong stakeholders' alliances that oppose to the planning solutions or strong conflicts among stakeholders, both of which need to be properly handled for improving the planning outcome.

CONCLUSIONS

The engagement of public and stakeholders in the planning process can support the gathering of valuable information and knowledge, which can improve both the process and the outcome of a planning exercise; while it also ensures credibility and transparency in the decision-making process.

Moreover, for a successful planning exercise, it is of importance for planners to be able to identify the level of 'acceptability' of goals/objectives and resulting plans, which can drive their efforts for better orienting policy actions and reaching consensus on behalf of a more effective implementation of plans.

In the present study, the proposed methodological approach takes advantage of a combination of a participatory tool and a multicriteria analysis tool, which are used for gathering and elaborating information on stakeholders' judgments on the proposed future development scenarios of a specific regional setting. The power of this approach lies on the potential to: establish a 'learning platform', facilitating participation, information exchange and mutual understanding among participants, considered as the driving forces towards a shared 'ground' of future developments of the specific region; incorporate multiple dimensions/views of the evaluation problem at hand, as expressed by the different interest groups involved; increase planners' perception on the acceptability of the proposed alternatives that can lead to the improvement of policy decisions; drive the generation of new innovative ideas and planning solutions, based on the potential offered by participatory processes.

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