

Chapter 21

Thinking Through Complex Values

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21.1 Introduction

Cities and territories are called upon to face strategic challenges of sustainable human development, based on the complexity of the interacting perspectives, interests and preferences of decision-makers and stakeholders, taking into account the existing resources and different forms of capital (human, social, economic, environmental, man-made, cultural, etc.) and their links and mutual relations (Fusco Girard, Forte, Cerreta, De Toro, & Forte, 2003; Kirdar, 2003).

In this perspective, integrated approaches to decision support for strategic planning can help to generate more efficient and effective results than sectoral approaches and, at the same time, are able to work in a multi-dimensional and cross-sectoral (inter-/trans-/multi-/sectoral) decision space (Wiek & Walter, 2009).

Indeed, integration is a complex concept, characterized by different dimensions that need to be defined and explored; it involves vertical and horizontal processes, which can be diffuse, fluid and multi-directional rather than rigid, hierarchical and unilinear; and it is related to different forms of spatial development activity (Allmendinger & Tewdwr-Jones, 2006). Integration in evaluation approaches means considering the dynamic interactions between different contextual dimensions, able to combine *existing relationships* and explore the potential to build *new relationships*.

The particularities and specificities of the context, in turn, suggest that the most appropriate integrated approach will depend on the *nature* of the decision-making situation in question (Leknes, 2001; Mayer, van Daalen, Els, & Bots, 2004) and on the manner of addressing it. Therefore, any given situated decision problem must be identified according to a multi-dimensional perspective.

Indeed, a decision-making situation can be considered an *opportunity* rather than a *problem* (Keeney, 1992), in which strategic thinking may creatively suggest further alternatives, starting from the awareness of existing values. Values not only guide

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the creation of suitable alternatives but also support the identification of decision situations.

“Value-focused thinking addresses the large void between unstructured creative thinking without bounds and very structured approaches to decision problems. It is the structuring of thinking to address decision opportunities and problems in creative ways” (Keeney, 1992, p. 8).

Value-focused thinking suggests a different paradigm for addressing decisions from the standard alternative-focused-thinking paradigm. This approach includes the following steps: the allocation of significant effort to articulating values, the articulation of values before other activities in decision situations and the use of the articulated values to identify decision opportunities and create alternatives.

In-depth and thorough understanding of the values inherent in a decision situation can provide important and sensitive insights into all aspects of decision-making and help to improve the decision process with synergic effects on the identification of opportunities and creation of alternatives. The recognition of existing values is closely linked to the identification of decision opportunities and guides the strategic thinking process.

Recognising the role of values means acknowledging the imperative need to move beyond the instrumental aspects of practice, starting from questions such as *what values? whose values? values for whom? values based on what point of view? values based on what kind of priority?*

The value-focused thinking approach considers as an essential assumption a multi-dimensional vision of value, a complex perspective, according to which it is possible to *integrate* values belonging to different and multiple dimensions.

In an integrated decision-making approach, *thinking through complex values* implies the inclusion of a multi-dimensional perspective, taking into account tangible and intangible values, *hard* and *soft* values, objective and subjective values, use values, non-use values and intrinsic values (Fusco Girard & Nijkamp, 1997 and Chapter 17, this book) and their synergic and complementary relationships.

Thinking through complex values means *thinking across boundaries*, considering soft spaces and fuzzy boundaries, overcoming different kinds of limits, and having plural ‘insights’ in order to formulate a ‘situated strategy’ (Liew & Sundaram, 2009) addressing a ‘situated decision problem’.

This chapter explores how *thinking through complex values* can support the structuring of integrated decision-making by orienting it towards the elaboration of strategic goals and actions able to create new values from the plurality of knowledge and the specificity of the context.

With its normative, spatial, temporal, cultural, social and cognitive features, the context becomes the frame in which planning responses and behaviours¹ can be shaped.

In its first part, this chapter explores the connection between values, knowledge and strategies, focussing on their interdependencies. Values make explicit the relations between different knowledge forms; conversely, the interaction of knowledge makes it possible to recognize values. At the same time, knowledge orients value and value represents the *measure* of knowledge (Zeleny, 2006 and Chapter 15, this book).

The second part of the chapter discusses the role of evaluation within an integrated perspective, which is seen as an ‘opportunity’ to elaborate strategies and ‘organize hopes’ (Forester, 1999; Sandercock, 2003) in spatial planning.

The integrated perspective considers evaluation as an activity embedded in the planning process and supporting many other activities in that process, each time playing a different role (Alexander, 2006). Within an integrated perspective evaluation underpins the dialogue between knowledge and values in order to translate such dialogue into the planning of strategic objectives and actions (Friedmann, 1987); it enables the identification of relevant values and related meanings, the exploration of opportunities and the creation of alternatives; it measures possible impacts and effects while managing complex and multiple priority systems.

The third part of the chapter focuses on three case studies, in which the evaluation process was structured in an integrated perspective guided by complex value-focused thinking and based on a ‘combinatorial philosophy’. The use of combinatorial assessment methodologies is becoming a widespread practice (Deakin, Mitchell, Nijkamp, & Vreeker, 2007; Fusco Girard, Cerreta, & De Toro, 2005; Krönert, Steinhardt, & Volk, 2001; Medda & Nijkamp, 2003; Miller & Patassini, 2005; Munda, 2008). They are seen as flexible tools able to overcome the limits of each single method, accommodate a multi-dimensional and plural perspective and improve the quality of the decision-making process.

These three cases represent different attempts to identify complex values as premises for the process at hand and to exploit the plurality and diversity of knowledge in order to identify situated strategies.

Finally, this chapter reflects the strengths and weaknesses of integrated approaches and highlights the need to view evaluation and planning as reciprocally embedded, mutually shaping activities. It may well be argued that within the field of integrative approaches, the recognition of value (economic, non-economic and intrinsic) assumes a fundamental role and is closely linked to different forms of knowledge. Through their interaction strategic objectives and evaluation criteria are identified, scenarios constructed, decisional rules deduced and sectoral assessments implemented in order to create and prioritise alternative options. The use of a combination of techniques penetrates and includes informal, ‘soft spaces’ of decision, able to complement the more formal process, combining flexible and functional approaches with formal development plan strategies (Allmendinger & Haughton, 2009), and considering decision support *versus* discussion support (Rinner & Bird, 2009).

21.2 The Interplay of Knowledge and Values

Thinking through complex values in spatial strategy-making takes on an ‘exploratory’ meaning. The way in which we deal with questions of value in planning was examined by Campbell (2002), who analysed how planners can make situated ethical judgements, based on a critical understanding of a given decision context. According to Campbell, in a world where knowledge can only be partial

and transitory, we must rely on judgement, and that fundamental to the process of judging between better and worse, is the *question of value*.

In fact, actions cannot be value-free. Thus, explicit consideration needs to be given to the nature of the values that our decision processes and outcomes are seeking to promote. That is why planning situations require evaluation methods based on complex value-focused thinking: this helps to articulate values, identify decision opportunities and create alternatives.

Values and cognitive perceptions are two of the most significant influences on decision-making which affect how decision-makers, decision-takers and stakeholders will interpret and respond to particular stimuli and sets of conditions.

In complex, uncertain and conflict-ridden planning contexts, different categories of values can be identified: direct-use values, indirect-use, non-use and intrinsic values. The explicit recognition of the existence of multiple interdependent values establishes both the conceptual and empirical foundations for understanding just how these value categories may be applied to the planning context.

This means becoming aware of the ‘complex social value’ of a context and its resources (Fusco Girard, 1987 and Chapter 17, this book). Thus, the explicit recognition of the existence of multiple interdependent values makes it possible to include instrumental and intrinsic values in evaluation. Further, by prioritising values we can distinguish between them, highlight different perspectives and take into account various kinds of conflicts.

Intrinsic value allows us to move beyond the private sphere and reflect on collective benefits and externalities, explicating a clear ethical dimension. It expresses the ‘glue value’, the system of immaterial relations, its specific character and its particular identity (Fusco Girard & Nijkamp, 1997, 2004). It is a proactive value, capable of constructing integration, reducing marginalisation, overcoming fragmentation and stimulating vitality: a ‘catalyst’ of material and immaterial energies, able to blend various value dimensions, helping to capture its deep unity (Fusco Girard, Cerreta, De Toro, & Forte, 2007).

Intrinsic value is consistent with the concept of *value complex* formulated by Zeleny (1998, 2005) and conceived as a ‘meta-criterion’, anchored and integrated in fundamental values that are broadly accepted and not subject to choice. The value complex is the expression of a cognitive equilibrium, characterised by candour and trust, based on principles, ethics and rules, mostly qualitative and expressible only in imprecise and fuzzy language, but rooted in specific contexts.

Recognising all the diverse categories of values implies the recognition of the multiplicity and diversity of knowledge. Some questions arise when dealing with the interplay of knowledge and values: does knowledge affect values, and if so, how? How can values be acknowledged, managed and assessed? What knowledge is necessary to do this?

Any representation of a complex system reflects only one subset of its possible representations (Giampietro, Allen, & Mayumi, 2006; Munda, 2008). A consequence of these deep subjectivities is that, in any normative exercise connected to a public-decision problem, one has to choose an operational definition of ‘value’. This in spite of the fact that social players with different interests, cultural identities and

goals may have different definitions of value. Consequently, to formulate a ranking of policy options it is first necessary to decide what is important for different social players and what is relevant for the representation of the real-world entity described in the model (Funtowicz, Martinez-Alier, Munda, & Ravetz, 2002; Munda, 2004).

Multiple values correspond to multiple forms of knowledge. Relations and dynamics between knowledge and values are not linear and reflect different value interpretations within a self-feeding process.

According to Zeleny (2006 and Chapter 15, this book), knowledge, in its multiple forms, is measured by the *added value* that coordination of effort, action and process adds to the inputs of material, technology, energy, services, information, time and so on, necessary to produce knowledge. Therefore values represent the measure of knowledge and must be socially recognised and accepted.

In a decision context and in activity such as spatial strategy-making, fostering encounters between diverse forms of knowledge means understanding the existence of different values. Exploring the landscape of knowledge forms (*KnowledgeScapes* according to Matthiesen, 2005) means exploring the landscape of values too, in a space of coexistence and dynamic interaction. Simon (1983) highlighted the importance of ‘social decision-making’ and articulated the ways in which values, alternative knowledge and preferences derive from interactions with the social environment. The context plays a crucial role and can be considered as the decision-making environment, which is spatial and scalar in nature (Larner & Le Heron, 2002).

Thinking through complex values focuses on the structuring of the decision problem (Mingers & Rosenhead, 2001), in order to address complex problem situations, that is, situations that are ‘ambiguous’, ‘ill-structured’, ‘wicked’, ‘messy’, ‘intractable’ or difficult to manage (Cats-Baril & Huber, 1987; Rittel & Webber, 1973; Rosenhead, 1989; Schön & Rein, 1994), characterised by the existence of multiple players, multiple perspectives, incommensurable and/or conflicting interests, important intangibles and key uncertainties. According to Mingers and Rosenhead (2001), problems of this kind are more ‘strategic’, in the sense that they set the ‘givens’ of well-structured problems (Ackoff, 1979; Checkland, 1985; Rittel & Webber, 1973; Schön, 1987). This perspective aims at considering different aspects or dimensions of a problem situation, rather than different types of problem (Mingers & Brocklesby, 1997).

Consistently with the complex-values approach, problem situations are closely related to the decision-making environment, which is strongly dependent on the interaction between knowledge and values.

Complex values are, in fact, linked to the context and to the decision frame (Strauss, 2008) and emerge from the cognitive frame shaping the physical, environmental, social and economic environment.

Complex values should be the driving force for any decision-making process: they help to explore the decision context and structure the problem, by guiding information collection, uncovering hidden objectives, improving communication, facilitating involvement in multiple-stakeholder decisions and interconnecting decisions. Complex values are ‘strategic values’ able to guide strategic thinking,

‘discover’ decision opportunities and create alternatives. They are embedded in a given problem context.

Exploring a broader decision context can open up decision opportunities (Keeney, 1996), and the decision situation is tailor-made for complex value-focused thinking. Values are, at one and the same time, the values of context resources and those of the stakeholders involved in the decision-making process. The creation of alternatives involves ‘interdependent values’ that guide ‘interdependent and interconnected decisions’. Strategic objectives can be considered as being the representation of values, which also specifies what is relevant for the strategy and the final decision.

The relationship between multiple knowledge, multi-dimensional values and possible strategies is fluid, dynamic and incremental and requires continuous interaction among/with the local stakeholders and decision-makers. This relationship develops progressively through continuous feedback thus activating and maintaining learning mechanisms.

Full awareness of relevant values in a decision context depends on the different kinds of information and knowledge, *hard* data and *soft* data that characterise the decision opportunity. It is necessary to move beyond multiple and complex values, towards the realisation that value judgements need to be made in the face of multiple and often conflicting ways of valuing (Richardson, 2005). Values are critical in determining how evaluation is carried out, from its inception, through the process at every stage: they are a key part of the decision-making process.

21.3 Towards Complex Multi-Method Evaluation Systems

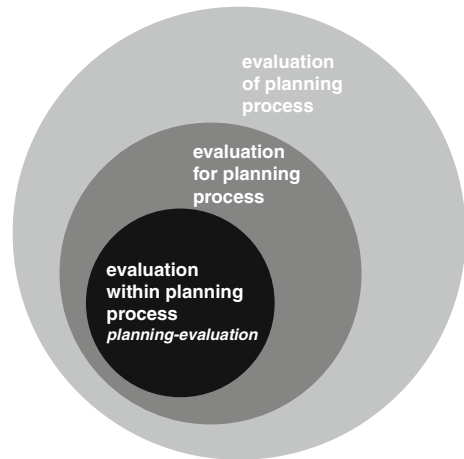
Evaluation can assume different meanings and roles within decision-making processes, especially if it is related to spatial planning.

E. R. Alexander (2006), after highlighting the fact that evaluation is intrinsic to all types of decision-making, focuses in particular on ‘evaluation in planning’. Indeed, the idea of ‘evaluation *within* planning’ (Fig. 21.1) seems to better interpret the concept of planning-evaluation proposed by Lichfield (1996) where the binomial makes explicit the close interaction and reciprocal framing of evaluation and planning: evaluation is conceived as deeply embedded in planning, affecting planning and evolving with it.

The evolution of evaluation methods reflects their evolving relationship with the planning process and also the way in which they interact with the diversity and multiplicity of knowledge and values.

In *Evaluation in planning* (2006), Alexander traces the history of the evolution in planning-evaluation and identifies four main generations of methods, “that represent progress from empirical positivism to post-positivist interaction” (Guba & Lincoln, 1989, quoted in Alexander, 2006, p. 11).² However, a direct match between planning-evaluation methods, planning models and form of rationality is not so obvious, although the diffusion of new paradigms and the identification of new

Fig. 21.1 Evaluation in relation to the planning process



rationalities has activated the development of new approaches and methods towards complex multi-method evaluation systems (Alexander, 2006; Deakin et al., 2007; Miller & Patassini, 2005).

These approaches move away from ‘traditional evaluation’ to embrace the integrated evaluation process, promoting wider communicative interaction with stakeholders in a dialectic and mutual learning process. Cognitive limitations, behavioural biases, ambiguity and variability of preferences and norms influence collective choices, where facts are uncertain, values in dispute, stakes high and decisions urgent (Funtowicz & Ravetz, 1991); this requires the adoption of evaluation tools that are scientifically sound, transparent with regard to the decision-making process, but also of the participatory type. One response to these questions has been the development of more integrated forms of assessment, variously called Integrated Assessment or Integrated Appraisal (IA), Integrated Impact Assessment (IIA) (Bond, Curran, Kirkpatrick, & Lee, 2001), Sustainability Assessment or Appraisal (SA) (Pope, Annandale, & Morrison-Saunders, 2004), Environmental Impact Assessment (EIA), Strategic Impact Assessment (SIA) (Partidario, 2000) and Strategic Environmental Assessment (SEA) (Fischer, 2007).

Moreover, focusing on the impact prediction does not guarantee the integration of multi-dimensional values in the decision-making process, nor does it take into account the many and diverse phases of spatial transformation. Strategic Environmental Assessment can be considered as a meaningful methodological environment for testing the applicability of the ‘planning-evaluation’ concept, moving beyond the impact assessment mindset (Bina, 2007) and integrating different and complementary approaches and methods oriented to strategic planning. It opens up possibilities for more inclusive and ongoing engagement processes, which are trans-disciplinary, committed to methodological pluralism, participatory and context situated (Carlsson-Kanyama, Dreborg, Moll, & Padovan, 2007).

Similarly, the application of different methods in combination with Spatial Decision Support Systems (SDSS) and Problem Structuring Methods (PSM)

(Rosenhead, 2005) shows how multiple perspectives can be included in decision-making contexts.

It is in this perspective that Social Multi-Criteria Evaluation (SMCE) proposed by Munda (2004 and Chapter 18, this book), which extends the field of social benefit-cost analysis to incorporate different aspects referring both to impact evaluation and to the participation of local communities in the decision-making process should be seen.

On several occasions evaluation approaches that are functional to the application of the planning-evaluation concept have been considered to be ‘planning tools’. At international level, many tools have been developed in order to facilitate the integration of environmental values in urban planning (de Roo & Visser, 2004; Rotmans, van Asselt, & Vellinga, 2000; Runhaar, Driessen, & Soer, 2009). These tools are applied to identify and assess spatial functions and process aspects and aim at integrating environmental and urban planning. According to Runhaar et al. (2009), it is possible to identify two main types of planning tool:

1. *Substance-oriented tools*, which take the form of knowledge on the state of the urban environment through indicators, Geographic Information System (GIS) and so on, and can be used to produce knowledge. This category includes computer-based Planning Support Systems (PSSs), covering a wide range of geo-information technologies, which are used to visualise environmental conditions and explore the effects of spatial developments.
2. *Process-oriented tools*, which facilitate dialogue, consensus-building and negotiation, and stimulate the search for and development of creative solutions, based on an interactive planning approach (Amler et al., 1999; Susskind, McKearnan, & Thomas-Larmer, 1999; Valentin & Spangenberg, 2000).

Hybrid planning tools, able to combine substance-oriented tools and process-oriented tools, aim to facilitate integration of environmental and urban planning, flexible modelling and support of interrelated decisions (Liew & Sundaram, 2009).³

Evaluation methods developed in planning, despite their widespread application, have been unable to bridge the gap between theory and practice. According to Alexander (2006), the challenge is to create an evaluation framework that is “responsive to complexity, transparent for communication, and enable effective interaction” (p. 274), seen as an *arena* for debating and resolving conflicting claims.

21.4 Integrated Evaluation Approaches: Some Situated Experimentations

Integrated evaluation approaches may enable the interpretation of material and immaterial relations characterising a context, the acknowledgement of existing tangible and intangible values, and the creation of strategies aimed at the production

of new values and at the sustainable development of many local resources in a multi-dimensional perspective.

There is a need for developing useful models of contingent situated application, facilitating the development and institutionalisation of complex multi-method evaluation systems, which take into account specific purposes and are linked to the specific context.

In order to understand just how integrated evaluation approaches can be translated into complex multi-method evaluation systems and become planning tools, three Italian case studies are presented. They focus mainly on the evaluation/planning relation within the design of local development strategies: the first concerns the integrated plan for the Altilia-Saepinum archaeological site (in the Molise region); the second, the strategic plan for the Buccino historic centre (in the Campania region); and the third, the role of evaluation in the design of the Cava De' Tirreni master plan (also in the Campania region).

In spite of the very different scales and geographic specificities of these three cases, the same methodological framework was applied, adapted to each case by using the communication, analysis and evaluation methods and techniques best suited to each planning context. Each of them explores the relation among knowledge mobilisation, values identification and the construction of spatial strategies.

An internal path developing in small steps, able to 'integrate' and 'keep together' diverse elements is the leitmotif that runs through these three cases; it has an incremental rather than a cascade nature thanks to continuous feedbacks. This leitmotif underpins the methodological framework common to the three cases and, consistently with the Keeney's 'value-focused thinking' approach (1992, 1996), is conceptualised as *thinking through complex value* and is divided into four phases:

1. *recognising a decision problem/opportunity* – this phase is related to the definition of the problem situation and aims at highlighting the multiple dimensions of the context (spatial, geographic, economic, social, environmental, anthropologic and cultural) by analysing *soft* and *hard* data and activating various forms of knowledge (explicit, systematized, experiential/practical-contextual, implicit, etc.) (Healey, 2008) with respect to specific needs; the ultimate goal of this phase is to identify spaces for action representing opportunities for local development and not only solutions to a specific problem;
2. *specifying values* – this phase aims at identifying the values embedded in the activated knowledge; special attention is paid to capturing and exploring local complex social values, to explaining the situated frame and to disclosing existing strategic objectives and any existing conflicts;
3. *creating alternatives* – the action space is explored in terms of decision opportunities within a broader decision-making context able to deal with shared knowledge and values and fostering plural micro-decisions in the light of local potential and criticalities;

4. *identifying strategic actions* – this phase responds to the need for defining ‘preferable choices’ arising from dynamic and flexible learning processes and expressing integration and complementarity between procedural strategies and transformative strategies (Bina, 2008).

The three experiences are described by analysing main issues, methods adopted and outputs.

21.4.1 Altilia-Saepinum: From Archaeological Site to Territorial Catalyst

The archaeological site of Altilia-Saepinum⁴ is an interesting Roman city, founded in 293 BC, situated on the Matese mountainside. It belongs to the municipal territory of Sepino (CB), a farming village in Molise and a well-known cultural and thermal centre. Sepino is also the centre of many tourist itineraries, combining ‘the pathway of transhumance’ and ‘the Samnite civilization’; moreover, the Altilia-Saepinum site is situated at the intersection of two roads of age-old significance. Despite its important historical heritage and its relations with the social, economical and environmental context of the Campobasso Province, the site’s potential is still largely untapped.

However, enhancement of this site is recognised by local institutions and inhabitants as key to creating a competitive territorial system leveraging on sustainable tourism, involving a larger geographical area, including other municipalities of the Campobasso province and comprising a total of about 18,500 inhabitants. These are small- and medium-sized communities with strong ties to their land, where the prevailing farming and craft economy limits changes, but guarantees the persistence of strong links between the natural and built environment, constituting an important *complex value* for this territory.

In 2007, the Sepino municipality and the regional archaeological heritage authority launched a strategy-making process with the aim of developing a program for submission for EU funding. The original stimulus for this initiative came from the cultural association ‘Friends of Sepino’ which was concerned about the future of the site and wished to promote its potential. Thus a decision-making process was launched to identify a strategy for the enhancement of the Altilia-Saepinum site, following the steps illustrated in Fig. 21.2.

The first step comprised in-depth analysis of *hard* and *soft* data. The main outputs of this phase were the identification of: (1) connections between Sepino and other key archaeological sites and urban centres in the region and in the whole of southern Italy; (2) plans and programs responsible for the current transformation of the area and at times causing stagnation rather than development. This binomial dispelled the perception of Sepino as an isolated resource and suggested that this site should be seen as a resource able to kick-start the stagnant economy through the development of tourist-related activities. The site’s location and strong links

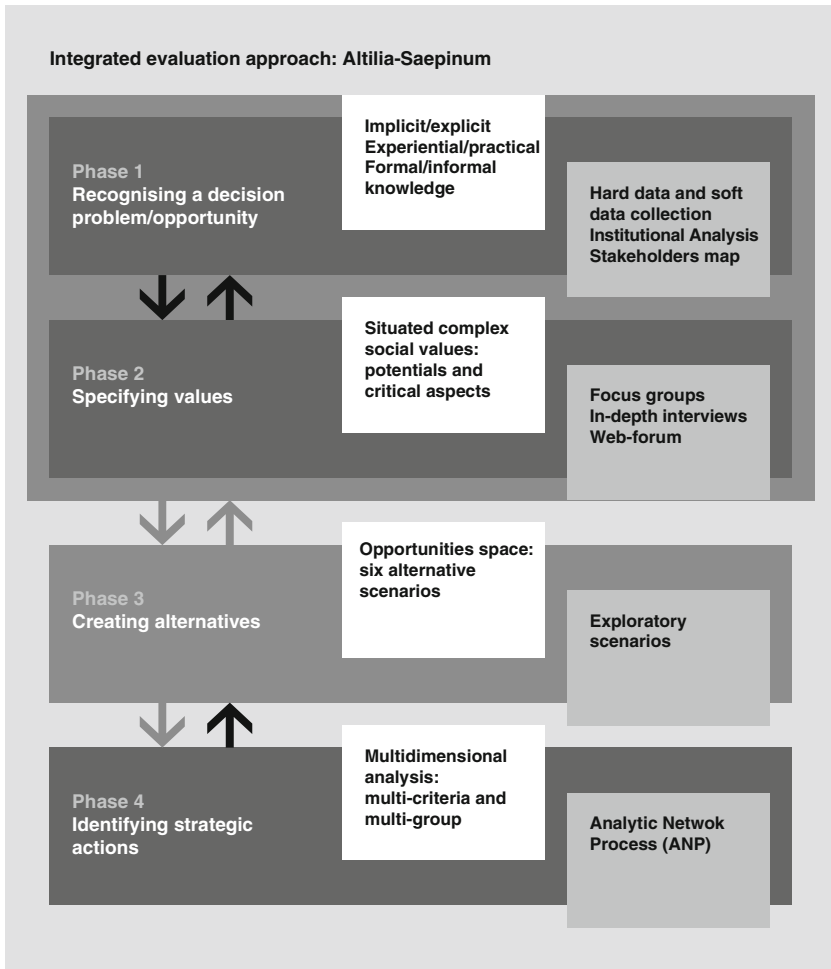


Fig. 21.2 Methodological approach: steps and tools

with other historical and cultural heritage sites made this opportunity feasible and suggested the possibility of reframing the site within a more complex and diversified archaeological system.

An Institutional Analysis (IA) (De Marchi, Funtowicz, Lo Cascio, & Munda, 2000) was carried out to transform this opportunity into reality. To this end, the first phase concluded with the identification of both relevant decision-makers and stakeholders. In particular, decision-makers were selected among those institutions able to follow the transformation process up to the implementation and management stage; stakeholder categories acknowledged as relevant included some *environmentalist groups*; *sports and cultural associations* directly involved in activities concerning this site; local *restaurateurs, retailers* and *small businesses*, who would

benefit from promotion of the site; *farmers*, representing the traditional economy and culture; *students*, especially from the University of Perugia, because of their frequent field trips to the archaeological site; *tourists*, as potential users of the site; and academic experts from different fields (archaeology, philosophy, engineering, economics, etc.).

During the second step, thematic focus groups were organised together with a web-forum and in-depth survey in order to identify the cultural, social, environmental and economic views of local inhabitants, their perception of critical aspects and potentials and their preferences for the complex of Altilia-Saepinum and its related surroundings. The exploration of opportunities started here and continued throughout this phase.

The third phase focused on the identification of opportunities based on the Exploratory Evaluation Approach (EEA) (Barbanente & Khakee, 2005). The Exploratory Evaluation yielded six possible transformation scenarios. Their cognitive framework reveals the main *preferences* of the community and, the problematic issues that should be addressed and solved in strategic terms:

1. a *museum centre*, responding to the lack of a centre collecting and preserving documents and material evidence on local history and the archaeological site;
2. a *centre for archaeological and environmental research*, aimed at integrating and promoting the environmental and historical-cultural characteristics of the site;
3. a *tourist services centre*, providing information on local tourist, cultural and recreational services and facilities, in order to promote the local tourist industry;
4. an *agricultural and food district*, aimed at creating a cluster of local resources including: quality of the territory and typical agri-food productions, cultural heritage, crafts and art tourism;
5. an *'introduction to the town' centre*, that is, an information and communication centre near the archaeological site, also acting as a laboratory for the spread of culture;
6. an *eco-archaeological village*, focused on eco-archaeological research and implementing 'sustainable architectural experiments' within the archaeological site.

These scenarios clarified what the archaeological site of Altilia-Saepinum may become in the future, what is relevant for those who live in the territory of Sepino and also for those who visit it. At the end of this phase the existing system of tangible and intangible relationships and values that characterise the Altilia-Saepinum context finally became clear.

During the fourth phase, multi-criteria and multi-group evaluation of the six alternatives was carried out in order to identify the preferable, shared solution. The six alternatives were compared through the application of Analytic Network Process (ANP) (Saaty, 1996, 2001, 2004). This method was used since it provides a 'creative approach' to practical ways of thinking and solving decision-making problems. It allows representation of each alternative scenario within a reticular framework of goals, objectives, criteria and solutions and the managing of preferences by

propagating them across the reticular structure consistently with the system of goals, criteria and solution interdependencies.

ANP models have two parts: the first is a control hierarchy or network of objectives and criteria that verifies the interactions in the system under study; the second includes the many sub-networks of influences among the elements and clusters of the problem, one for each control criterion.

In the Altilia-Saepinum decision context, the hierarchical structure of ANP helped to define the weights to be assigned to each criterion. For example, landscape was recognised as being among the principal resources of the territory, and job creation and partnerships are considered crucial for the development of the area. After all the comparisons were completed, the results showed that the preferable scenario that best combines environmental, social and economic criteria is the *centre for archaeological and environmental research*, followed by the *eco-archaeological village*, the *'introduction to the town' centre*, the *tourist services centre*, the *museum centre* and the *agricultural and food district*.

The decision-making process, designed so as to identify suitable alternatives through dialogue between scientific, technical and common knowledge, was able to implement a transparent and shared decision-making strategy for the enhancement of the Altilia-Saepinum archaeological site, recognising the main components of the opportunity context and including their mutual implications, incorporating multiple and heterogeneous dimensions and plural values.

21.4.2 Buccino: Building a Strategy for an Integrated Valorisation

Buccino,⁵ a small town with about 5,000 inhabitants, stands in a favourable location in the basin of the River Sele and the Gulf of Paestum.

The discovery of archaeological findings witnessing human settlements in Ancient Neolithic times and the unearthing of an ancient Roman town under Buccino's historic centre gave birth to an archaeological park that is frequented by local inhabitants, but whose potential is still largely untapped.

The main goal of this study, conducted within a broader integrated program sponsored by the regional and provincial administrations, was to design transformation strategies consistent with a sustainable development perspective and with the resources of the context, expected demands and the local relational and institutional fabric.

In this case too the process followed the four phases illustrated at the beginning in Section 21.4 of this chapter (Fig. 21.3).

In phase one, an interpretative analysis of *hard* and *soft* data and information revealed the image of an area challenged by crisis and decline: economic activities are mainly traditional and unable to stand up to the challenge of competitiveness; this is causing a drain of young people, leading to an ageing population and preventing sustainable local development. On the strengths and opportunities side, Buccino lies in the heart of an area rich in high-quality agri-food products and

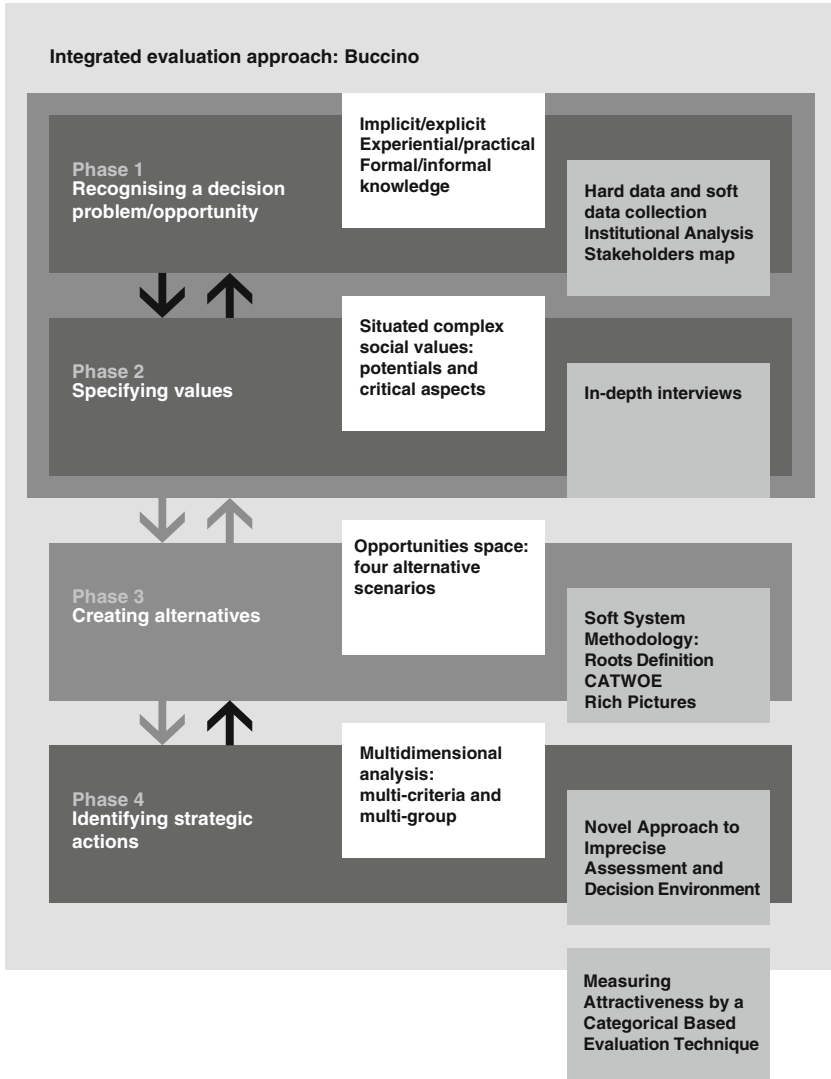


Fig. 21.3 Methodological approach: steps and tools

cultural resources and is part of a cluster of small towns able to develop significant interrelations and move in the direction of change.

The Institutional Analysis (IA) was carried out in this perspective hence looking for categories of stakeholders able to translate this vision of opportunities into concrete actions. Three categories were identified: (1) promoters, (2) users and (3) operators.

Promoters include local and regional institutions (the local administration and the regional authority for archaeological heritage) and education institutions. *Users*

are the citizens of Buccino, and its surrounding area, who use the local services and are set to benefit from the area's development. *Operators* are divided into four main groups: (1) typical product producers (farmers and processors), (2) building enterprises, (3) tourism operators and (4) social operators.

All the stakeholders were interviewed; the interviews were structured combining *learning dynamic approaches* defined within the framework of Soft System Methodology (SSM; see Checkland, 1981, 1999, 2001) which aims at replacing positivistic epistemology with a phenomenological view in which actors are seen as subjects attributing meaning to a perceived reality. SSM provides a systemic framework to those involved in a problematic situation and fosters debate on ways of improving the problem situation. The interviews, structured according to the Roots Definition (RD) model and analysed using the CATWOE (*Customers, Actors, Transformation process, World view, Owners, Environmental constraints*) procedure, were represented by the Rich Pictures (RPs) technique (Checkland, 1981) useful for structuring the acquired data, information and knowledge and also for developing a graphic report to be used for further communication and interaction.

The RPs reveal that some elements are recurring, albeit in different combinations with other components; certain spatial characteristics, problematic issues and future perspectives are widely shared by different categories of stakeholders at different levels.

One RP was synthesised for each stakeholder category, and together they represent the main contents of the scenarios developed during the third phase. Each scenario interprets main strategic objectives:

1. *Buccino 'like Salerno'* – This is mainly an economic development scenario, based on a tourism development model supported by territorial marketing activities similar to the one adopted in the city of Salerno; this scenario is mainly based on the potentials of local resources (archaeological heritage, landscape and typical products) and on the possibility of making Buccino a node of a network with the neighbouring villages;
2. *Buccino productive city* – This scenario focuses on rehabilitation of the industrial sector. It foresees reorganisation of industrial activities, the replacement of abandoned ones and the use of alternative energy sources to meet industrial demand;
3. *Buccino 'nature city'* – This scenario leverages on environmental and agricultural resources as resources for the future; it focuses on incentives for greening the production sector and encouraging young people to improve the competitiveness of traditional activities through certification and traceability;
4. *Buccino 'slow city'* – This vision identifies sustainable tourism as the key local development strategy enhancing tangible and intangible resources; it includes the promotion of archaeology, exhibition venues and services, local production and the landscape, and it foresees improvement of accommodation services. The goal is not only to attract quality tourism but also to guarantee a better quality of life for the inhabitants of Buccino.

Finally, in the fourth phase multi-criteria and multi-group evaluation of the four alternative scenarios was carried out to identify the preferable and shared master plan.

The scenarios were compared by applying the Novel Approach to Imprecise Assessment and Decision Environments (NAIADE) (see Chapter 18 by Munda, this book), through which two evaluation matrixes are structured and implemented: the multi-criteria assessment matrix and the multi-group assessment matrix (interdependent in the Social Multi-Criteria Evaluation, SMCE; Munda, 2004) thus emphasising the social dimension of the decision at stake and guaranteeing an effective rigorousness in multi- and inter-disciplinary interaction.

Buccino 'like Salerno' and *Buccino 'slow city'* obtained the highest preference in the discussion and were assigned the role of guiding the master plan work in a 2-fold sense: providing a vision for the future and leveraging on the sustainable use of local resources for development. The two scenarios were incorporated in several elements of the master plan: the general goals – the main one being to guarantee a good quality of life – and also the many interventions⁶ proposed to drive the city towards the envisioned change. An additional multi-criteria assessment was carried out to identify priority actions able to set in motion development and change. This latter assessment was based on the method outlined in Measuring Attractiveness by a Categorical Based Evaluation Technique (M-MACBETH) (Bana e Costa & Vansnick, 1999; Bana e Costa, de Corte, & Vansnick, 2005) for two main reasons: this approach enables the use of qualitative judgements, crucial when judgements are collected in multi-disciplinary and multi-expertise environments; and its outputs are organised as preferable groups of actions in the light of the different emphasis assigned to groups of criteria and thus supporting a strategic composition of actions.

The integrated assessment described in this case is not a technique but rather an interdisciplinary and participatory process of combination, interpretation and sharing of knowledge and values among the various scientific disciplines to promote the understanding and management of complex problems, and the identification of shared enhancement and sustainability strategies.

21.4.3 Integrated Spatial Assessment in the Cava de' Tirreni Experimentation

Cava de' Tirreni⁷ is a municipality that acts as a 'junction' in the area of the Amalfi coast and the province of Salerno. An SEA was carried out to support the development of a master plan: this offered a practical opportunity to test the Integrated Spatial Assessment (ISA) approach (Fusco Girard, Cerreta, & De Toro, 2008).

This approach was developed to integrate multi-dimensional aspects within a complex development of strategies and choices in planning, acknowledging the importance of the environmental, social and economic effects of a decision-making process focused on the creation of alternative transformative options.

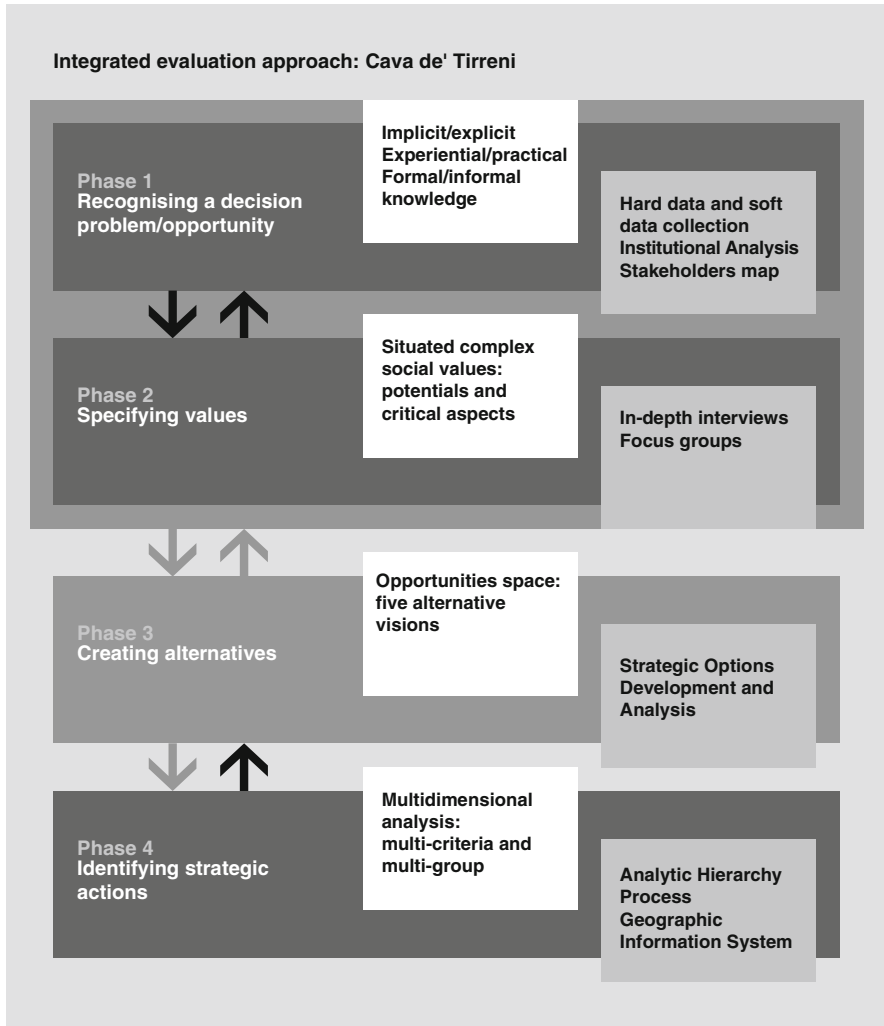


Fig. 21.4 Methodological approach: steps and tools

In ISA the recognition of complex social values is the basis for a collective decision-making process, which includes the steps of problem-setting, problem-posing and problem-solving, and the sharing of different forms of knowledge, and which takes into account issues of justice and equity. Different analyses are combined to manage conflicts and include various levels of uncertainty (see a representation of the evaluation process in Fig. 21.4).

Phase one, implemented similarly to the prior two cases (public meetings, ad hoc interviews and data and information collection), mainly aimed at creating a

permanent interaction ‘platform’ supporting dialogue and mutual learning between citizens, experts and administrators in line with the national and European guidelines on SEA. The interaction platform is mainly based on a relational frame also supported by a participatory GIS; it evolves together with the planning process and allows for the creation and development of all plan-related decisions. Five visions were produced in phase one:

1. *Cava de’ Tirreni, beautiful and identity-bearing*, aiming at strengthening the symbolic image of a ‘junction city’ by enhancing its cultural, environmental and landscape resources and assigning specific significance to their use potentials;
2. *Cava de’ Tirreni, modern and productive*, addressing the need to promote production and commercial activities and activating new ones by supporting innovation and quality;
3. *Cava de’ Tirreni, regenerated and friendly*, focusing on quality of life and therefore on tangible and intangible actions targeting equity and inclusion;
4. *Cava de’ Tirreni, ecological*, considering environmental conditions crucial for the future and fostering environmentally friendly activities and the use of renewable energy sources;
5. *Cava de’ Tirreni, territorial hub*, focusing on the attractor role of the city with respect to the surrounding municipalities; this vision aims at improving urban connectivity and accessibility.

These visions were developed using the Strategic Options Development and Analysis (SODA) method (Mingers & Rosenhead, 2001) which is designed to deal with complex, messy problems, taking into account both their qualitative and quantitative aspects. This approach involves the use of cognitive mapping as a language to express personal constructs and facilitate team negotiation, with emphasis on action rather than on descriptions. By applying the SODA method, the potentials and weaknesses of each vision were identified, and the associated specific strategic goals and actions were analysed.

Visions, strategic objectives and strategic actions were organised in a hierarchical structure and for each vision, using the Analytic Hierarchy Process (AHP) (Saaty, 1980, 1992) integrated with the GIS tools (Marinoni & Hoppe, 2006), ‘susceptibility to transformation’ maps were built, which express the different aptitude of the territory to ‘receive’ a given strategic action, in the light of its potential environmental impacts, criteria and characteristics. The lesser the territorial and environmental impacts, the greater will be the willingness of that territory to receive the strategic action proposed.

By using the typical approach of the SEA, translating it into a more articulated evaluation process defined ISA, we aimed to integrate social, territorial and environmental aspects in the development of strategies and planning choices, while recognising the important role of stakeholder perceptions and environmental effects within the collective decision-making process for the creation of alternative opportunities.

21.5 Discussion and Final Remarks

The analysis of the three case studies reveals that the four-step process of incremental assessment is strongly influenced by contextual factors.

The territorial dimension, geographical and environmental features, economic, social and human resources are some of the key components in relation to which the dynamics of interaction between knowledge and multi-dimensional values have been explored. They allow possible opportunities and knowledge-multi-dimensional values relationships to be made explicit and be translated into strategies of transformation.

The specific nature of each case study determined the criteria to be followed in the selection of appropriate methods and techniques.

In the Altilia-Saepinum archaeological park the evaluation process made it possible to understand how the multiple values of an archaeological site of great importance but exposed to continuous decay can become drivers of a development process involving the whole region.

Thinking through complex values not only enabled recognition of both use and non-use values peculiar to a specific asset but also mobilised identity values.

Thus, identification of possible transformation opportunities becomes a way for making existing values explicit and, at the same time, creating new, context-sensitive values poised to strengthen the bond with new direct, indirect and potential users.

The techniques selected enabled an exploration which, whilst taking into account the different dimensions of a context, did not compromise the richness of the knowledge framework to be constructed.

In particular the ANP method evidenced the complexity of relationships characterising, on the one hand, the set of decision criteria, factors and objectives and, on the other, the interactions among stakeholders and decision-makers and their influence on the selection of the preferred scenario.

As to the Buccino case, by redefining this municipality as a node in a network of small towns, the evaluation process allowed the identification of local resources and development potentials, thus offering opportunities to towns apparently set on the road to decline.

Relational value, which is the materialisation of synergies and complementarities mobilised and created by the process, acted as a connector between the transformation opportunities and specific strategic goals shared by different stakeholders.

The evaluation of intangible assets takes on a key role and makes it possible to analyse the social concept of value in a multi-dimensional scenario. Soft System Methodology (SSM) methods combined with Multi-Criteria Decision Analysis (MCDA) and Multi-Group Decision Analysis (MGDA) methods enabled the integration of cognitive and evaluation dimensions as well as technical and economic dimensions.

In the Cava de' Tirreni case, the opportunities that emerged from the interactions focused mainly on the preservation of the identity of a context wishing to regenerate itself. This context shows a diversity of values, among which use value long

prevailed over the others. Identifying opportunities here means bringing to light intrinsic value in terms of the interdependency of the natural and human landscapes. In this case, the integrated use of SODA, MCDA and GIS shaped the different phases, acting as a powerful combination for providing decision support in strategic decisions. SODA helps decision-makers in devising visions and exploring possible effects, while MCDA and GIS can support an in-depth performance assessment of each strategic action, as well as the design of more robust and better options.

To sum up, these experiences show that, despite the availability of substance-orientated and process-oriented planning tools, achieving the integration of planning and evaluation remains a challenge. However, it can be argued that within the field of integrated approaches, value recognition (use, non-use and intrinsic) assumes a fundamental role and is closely linked to different forms of knowledge, and through their interaction strategic objectives and evaluation criteria are identified, scenarios constructed, decisional rules deduced and sectoral evaluations implemented in order to create and prioritise alternative options.

Notes

1. Strauss (2008) underlines that the concept of frame is used in a variety of different ways. Frames are understood as constructs based on shared cognitive structures that inform perception and identification and condition behaviour (in Foucault's terminology, this is the power/knowledge nexus). Kahneman and Tversky's (1979), Tversky and Kahneman (1986) articulation of prospect theory combines both metaphorical and constructivist elements in the context of the first phase of the decision-making process. The framing and editing phase consists of a preliminary analysis of the problem, which frames the effective acts, contingencies and outcomes (Tversky & Kahneman, 1986, quoted in Strauss, 2008).
2. The first generation includes Benefit-Cost Analysis (BCA), Financial Impact Analysis (FIA) and Cost-Effectiveness Analysis (CEA) and is characterised by reliance on scientific measurement; the second generation combines empirical measurement with some assessment of goals-achievement, applied to Goal Achievement Matrix (GAM) and Multi-Criteria Evaluation (MCE) methods; the third generation looks for objective and value-free ways of assessment and includes methods of impact analysis, as Planning Balance Sheet Analysis (PBSA), Environmental Impact Assessment (EIA), Social Impact Analysis (SIA); the fourth generation is oriented to post-positive intersubjective interaction and Community Impact Analysis (CIA), and its evolution in Community Impact Evaluation (CIE) is the best expression of this category of methods. Other classifications relate evaluation methods to various planning models, which include deliberative planning, interactive-communicative planning, coordinative planning, planning as frame-setting and relational planning, and are associated to different kinds of rationality, as instrumental, substantive and communicative (Alexander, 1998; Khakee, 2003).
3. In the Netherlands there are several of these methods, five of which are (Runhaar et al., 2009): the Milieu Maximalisatie Methode (MMM, or environmental maximisation method), Milieu Op Z'n Plek (the right place or the environment), LOGO (local area typology and environmental quality), MIRUP (environmental tool in spatial plans) and MILO (environmental conditions in the living environment). These five methods have been developed on the basis of the experiences of urban planners with integrating environmental and urban planning.
4. Atilia-Saepinum case study has been carried out within the elaboration of the degree thesis in Architecture of Arch. Maria Carmen Fanelli, on the subject 'The paths of antiquity: heritage to be discovered, knowledge to be utilized', tutor prof. Francesco Bruno, co-tutor Arch. Maria Cerreta, University of Naples Federico II, July 2009.

5. Buccino case study has been carried out within the elaboration of the degree thesis in Architecture of Arch. Vincenzo Cuozzo, on the subject 'Integrated assessments for a valorization sustainable plan: from Volcei to Buccino', tutor prof. Luigi Fusco Girard, co-tutors prof. Pasquale Miano and Arch. Maria Cerreta, University of Naples Federico II, July 2009.
6. The designed interventions are structured into five reference groups: valorisation of the castle, construction of a theatre arena, construction of an archaeological museum area and development of an archaeological-naturalistic path.
7. Cava de' Tirreni case study has been carried out within the elaboration of the new municipality Master Plan. The working group was thus organised: Urban planning and scientific coordination, prof. Carlo Gasparini; Geomorfology, Dr. Silvana Di Giuseppe; Agronomy, Dr. Maurizio Murolo; Landscape, prof. Vito Cappiello; Economic and financial feasibility, prof. Ettore Cinque; Infrastructures and Mobility, Ing. Vincenzo Cerreta and Ing. Giulio Valfrè, D'Appolonia SpA; SEA, Arch. Maria Cerreta, Arch. Pasquale De Toro, Arch. Saverio Parrella; Graphic design and communication, Arch. Franco Lancio. We thank for support and collaboration the technical staff of Cava de' Tirreni municipality.

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