








Applying Geodesign Towards an Integrated Local Development Strategy: The Val d'Agri Case (Italy)

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Abstract. Geodesign is an effective collaborative methodology oriented towards designing spatial strategies with a multidisciplinary approach, involving not only the local community but also professionals from design, spatial sciences and information systems. This synergy acts as a driver for a general knowledge framework, which allows these established professional fields to develop further and collaborate effectively. This paper proposes the Geodesign workshop outcomes within the RI.P.R.O.VA.RE research project, oriented towards the definition of an integrated local development strategy in the Val d'Agri area, in the inland Basilicata region. The results, therefore, represent a component within a much broader project framework; however, the participatory design approach used in the Geodesign experience made it possible to evaluate the different project proposals, moderate the negotiation between two different focus groups and achieve a single and shared participatory design. A key role was played by the research team that moderated the organisation, localisation and expression phase of the different project proposals, having sufficient spatial and temporal knowledge to integrate the Geodesign outcomes and elaborate a future-oriented strategy.

The paper is structured in four parts. In the introduction it is specified how the use of the Geodesign tool was brought into the case study. The second part briefly outlines the study area context: the Val d'agri. The third part focuses on the Geodesign Workshop description and, finally, the outcomes are illustrated, from which the research team defined the integrated local development strategy.

Keywords: Geodesign · Inland areas · Local development strategy

1 Introduction

Geodesign is a methodology approach to decision-making which integrates spatial information science tools to support physical spatial development planning, and can help

address many of the current problems faced in urban and regional planning practices [1]. In 2012 Carl Steinitz formalised a methodological framework, called Geodesign Framework [2, 3], aimed at identifying the potential future transformations of a territory as a function of current dynamics. This framework proposes six questions and six models, which may be common to all Geodesign projects, but does not suggest a single linear process, but one characterised by several iterative cycles and possibilities for backaction.

While the relevance and interest in Geodesign research is already producing promising results and successful case studies [4–6], there is not yet a wide diffusion of its application in planning, mainly in Italy [7, 8].

Li and Milburn [9] underlined the importance of combining geodesign with increasingly advanced information and communication tools. Indeed, while geodesign continues to be used to achieve more complex goals due to its analytical skill, tools for collecting increasingly detailed data continue to evolve, including online interfaces and portable GIS tools. Idea-based graphics technologies have also been rapidly advancing. Interactive drawing devices allow designers to generate instant digital graphic products by freehand drawing on screen.

An important network for the interchange of research applied to Geodesign is the International Geodesign Collaboration linked to the GeoDesign Summit [10], where the most up-to-date applications, technologies, teaching tools and theories of GeoDesign are discussed between academia and practice.

The following sections discuss the application of the Geodesign approach to a case study, as part of the activities promoted and developed within the project “Rehabilitating Countries. Operational Strategies for the Valorisation and Resilience of Inland Areas” (RI.P.R.O.VA.RE) [11]. This project is structured around three research objectives: redrawing the Inland Areas geography [12, 13], understanding the Inland Areas resilience and defining sustainable and resilient development strategies [14]. It has as its field of experimentation the Campania and Basilicata regions.

The paper aims to illustrate the activities and results achieved with Geodesign in the Medio Agri Living Lab, an area composed of six municipalities along the Agri river basin.

The idea of starting a Living Lab in the study area is aimed at involving local stakeholders in decision-making processes and, more specifically, in co-designing area strategies, able to act on the resilience features of the systems. Therefore, actions linked to risk reduction and actions aimed at regenerating and enhancing the potential [15, 16], in terms of natural and cultural resources and productive abilities of these territories, are combined, in order to enhance the inland areas productive landscapes, recovering and strengthening local manufacturing skills.

In operative terms, the Living Lab was organised in six phases, each with a specific objective, and followed the Logical Framework Approach methodology (a rational framework to identify and organise spatial problems in a cause-effect relationship at the basis of a planning activity) [17]. The intention was to integrate Geodesign with the Logical Framework Approach methodology because the combination of these approaches is considered successful and has the potential for extensive application as a key component of planning tools. Within the Living Lab two days were spent on Geodesign, in the San Martino d’Agri and Roccanova municipalities.

2 Val d'agri Area Context

The Middle Agri area covers the central sector of the Agri river basin, one of the five rivers that cross Basilicata and flow into the Ionian Sea. The area is predominantly mountainous in its western part, with the Monte Raparo Site of Community Interest (SCI); most of the remaining area is hilly, with sandy and conglomeratic hills, which characterise it for its high hydrogeological risk. Moreover, the Val d'Agri's largest territorial unit is specialised in oil extraction activities due to the presence of Europe's largest onshore oil field [18, 19]. This generates major conflicts between oil resource industrial exploitation and environmental protection issues.

According to the SNAI classification, the six municipalities that are part of the survey group (Gallicchio, Missanello, Roccanova, San Chirico Raparo, San Martino d'Agri and Sant'Arcangelo) fall within class F - ultra-peripheral, i.e. those municipalities in the inland areas that are more than 75 min away from a pole that simultaneously has a complete upper secondary school offer, at least one hospital with a level I d.e.a. (Emergency and Acceptance Department) and at least one silver railway station. An evident migration phenomenon in the sample area leads to progressive depopulation. In the last decade, almost a thousand people have left the area; approximately 8% of the population currently stands at 10,634.

Mainly to overcome the lack of services, which compounds the marginal character of the area, the Union of Municipalities [20] of Medio Agri (Missanello, Roccanova, San Chirico Raparo, and Sant'Arcangelo) was established in 2017, recently expanded with the inclusion of the municipalities of Gallicchio and Armento. This Union aims to face up jointly to the difficulties affecting the area, starting with accessibility to essential services (education, health, transport). The setting up of the Union of Municipalities affected the choice of the area to be researched because it is believed that the smaller centers should join institutional forms of association between municipalities, both to ensure sustainable management of services and functions and to guarantee more opportunities for citizens.

The Medio Agri area has significant potential, especially in cultural and natural heritage, with a high ecological value of the ecosystems [21–24]. In particular, the area is affected by the perimeter of the Lucano Val d'Agri-Lagonegrese Apennines National Park, by a ZSC 'Murge di S. Oronzo', by a ZPS 'Lucano Apennines, Agri Valley, Monte Sirino, Monte Raparo' and by two SIC 'Lago Pertusillo' and 'Monte Raparo' [25].

3 Geodesign Workshop

Within the Medio Agri Living Lab, whose participants belonged to different professional fields, it was decided to use the Geodesign tool [3] to focus on the planning of action in the whole Medio Agri area and to concretise the ideas expressed in the description phase of eleven general objectives.

A simplified Geodesign approach was used in this case, as the activities were condensed into two days. The activities were supported by GeodesignHub (an online platform of Geodesign Hub Pvt. Ltd., Dublin, Ireland), and were set up according to the Geodesign International Collaboration (IGC) standards.

The Geodesign methodology is based on the constructive interaction of working groups, which individually develop the plan and subsequently arrive at a synthesis. There

is a preliminary phase in which the research group collects a number of thematic maps representing a snapshot of the territory from different points of view (environmental, cultural heritage, economic sectors, mobility etc.). Already in this phase, it is possible to give a project outline, which, in this case, was the research group's own. This is a necessary preparatory phase in order to have qualitative and quantitative references and to identify vulnerable resources, constraints, impacts and development factors through macroscopic indicators. The reference maps (see Fig. 1) allow us to understand the actual territory condition. In the Living Lab Medio Agri case the initial reference maps proposed were:

1. ACCO – Hospitality
2. AGRI – Agriculture
3. INST – Institutional services
4. CULT – Cultural heritage
5. INFR – Infrastructure and mobility
6. NAT – Natural heritage
7. COMIND – Trade-Industry

The maps show which territorial parts, according to their own vocation, are most attractive/vulnerable for a certain land use. The seven systems maps are classified according to a precise colour coding from red (high vulnerability) to green (low vulnerability).

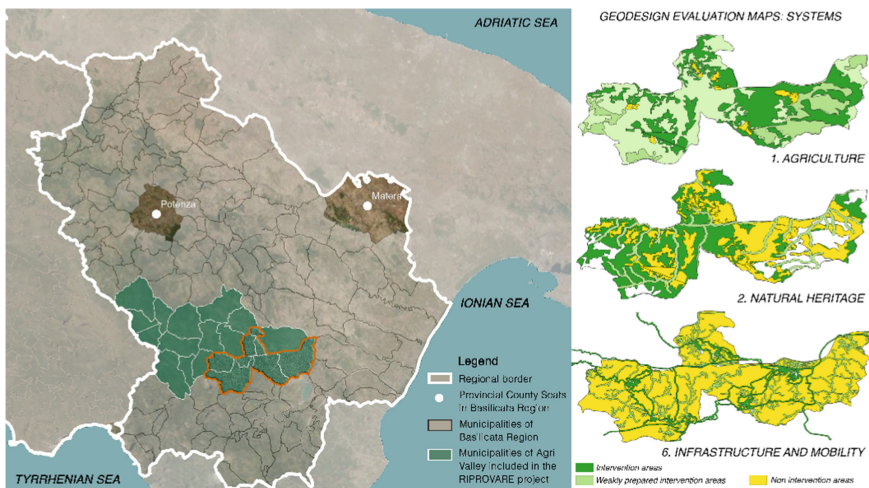


Fig. 1. Overview of the study area and assessment maps by systems prepared to define interventions on Geodesign [25]. (Color figure online)

The maps were then loaded into the GeodesignHub main interface with simplified graphics to comply with the programme's requirements (Fig. 2).

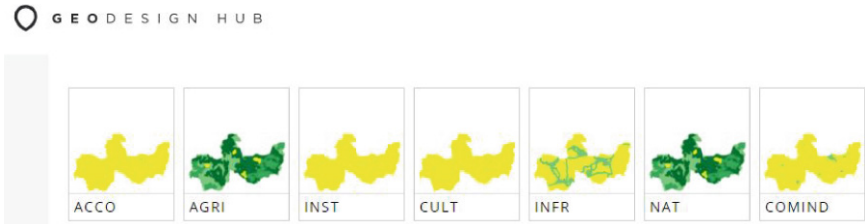


Fig. 2. System evaluation maps.

About forty participants from different profiles attended the Medio Agri Living Lab, during the days focused on Geodesign: local administrators, freelancers, researchers, university students, association and local community members. The invitation was addressed to the communities of the six municipalities belonging to the study area, which have already been on a common journey since 2017 because they established the Medio Agri Municipalities Union [25].

The participants were divided into two groups: tourism promotion and territorial protection on the one hand, local development and institutional and reception services on the other.

After a short study area and workshop objectives presentation, each participant, using a sketch-planning tool available on the platform, developed a set of geo-referenced conceptual ideas (diagrams), representing specific policies or projects for the seven systems.

A first set of proposals came up, represented and visible through an application structure supporting the groups. Each group can view and analyse the other projects by visualising and overlaying maps of the different ideas.

Eighty-six actions to be undertaken in the seven systems were located and described in this phase, divided into interventions and policies. Each diagram had to have a title, a location, a description, an estimated total amount and had to belong to one of the seven systems in which the context analysis was summarised. Updating the activities in the platform ensured that all participants could view the diagrams proposed by all group members in real time.

On the second day, the two groups' participants selected a set of project proposals in order to build a shared scenario, which was evaluated to find out the impacts generated by the transformations in the seven systems. Afterwards, the two groups were asked to negotiate the scenarios until a single strategic development scenario shared by all participants was reached (Fig. 3).

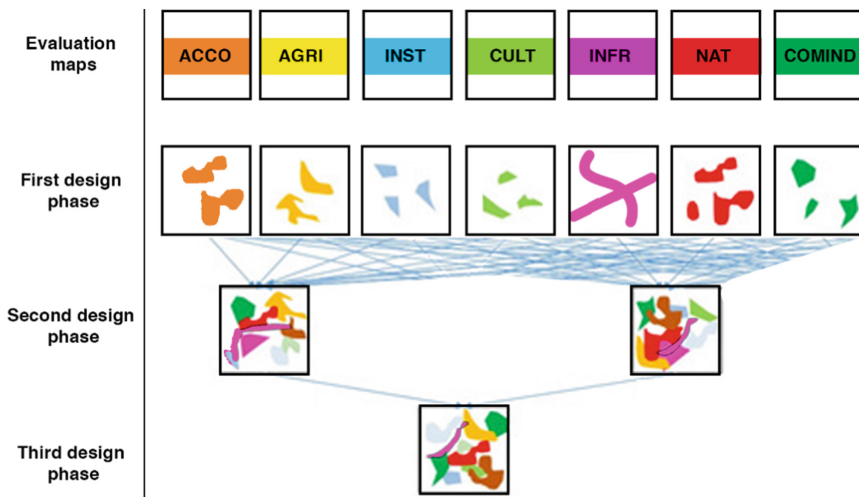


Fig. 3. The working structure of the workshop: in the first row the seven systems evaluation maps and in the second row the project and policy diagrams.

Below is a table with the interventions and policies that emerged in the Agriculture system (AGRI) and the Infrastructure and Mobility system (INFR), belonging to the final shared scenario (Table 1).

Table 1. Some actions and policies of the shared strategic development scenario.

Agricultural system	Infrastructure and mobility system
San Martino d’Agri oil mill restored and reopened	Improvement of the Rocanova-Sant Arcangelo road network
Olive plantation	Securing the SS598 crossroads
Back to the rural economy	Road public transport enforcement
Enhancing olive oil production	Public transport service adapted to the population’ needs
Missanello olive oil promotion	Ecological car sharing between municipalities
Agricultural consortium	Bus service between municipalities
Service cooperative	Sports centre upgrade
Hazelnut promotion	Bus terminals
Poultry breeding	Demand responsive transport
Tax exemption for agricultural labour	Coordination between mobility services
Milk processing consortium	
Agricultural labour management consortium	

Geodesign is a valid tool to support a negotiation process among stakeholders, with the outcome of a development scenario shared by the participants. In addition, the interventions and policies are a goal at a higher level than the municipal one, where services and planning policies have a different depth, especially because the study area is composed by small municipalities.

4 Results and Conclusions

The Geodesign workshop within the Medio Agri Living Lab was aimed at co-designing and testing a place-based policy through the processing of a starting framework for the integrated local development strategy [22]. The final shared scenario is the synthesis of project alternatives and the negotiation aimed at identifying the strong elements of the project proposals.

However, this experience did not exactly follow all phases of a Geodesign workshop, but focused on the elaboration and negotiation phase. The explanation is to be found in the time that was decided to spend on Geodesign, because it was only one of the many moments in which the participants faced each other within the Living Lab. On the other hand, the participant's presence could not be extended further because the organisation of the in-person activities followed a methodology based on the Logical Framework Approach (LFA), common to the other research groups.

The very important element is the methodological approach of Geodesign which can be adapted to different situations in practice. In particular, it is argued that it can become a valuable tool in the planning techniques toolkit and contribute to its renewal. Urban and territorial planning needs a tool that keeps up with the information and communication technology development [26, 27], but has a special focus on collaboration in defining territorial strategies. One of the objectives is the creation of a stable collaboration, even after the end of the field experience promoted by experts or a research group. Finally, as in this synthetic experience, it is believed that Geodesign expresses a greater potential when combined with other techniques, such as LFA.

The Geodesign outcomes within the Living Lab were fundamental to guide the research team in the integrated strategy definition, which was defined considering the overall project framework. In particular, the preliminary knowledge phase results, the Living Lab results as a participatory moment composed by specific phases and methodologies (context analysis, SWOT analysis, problem and objective tree technique, Analytic Hierarchy Process technique to identify priority objectives) and the Geodesign experience were taken into account.

The strategy suggested for the Media Val d'Agri area cannot avoid two basic conditions:

1. The promotion of new governance forms based on the associated management of some essential functions (making stable the path started by the Local Authorities);
2. The setting up of a shared process for the area' local development in the average-long term (vision) to be pursued through policies/interventions that shall be implemented to achieve the objectives assumed.

The objective of halting the municipalities' depopulation and making the territory attractive to non-residents and/or temporary residents were considered "goals" to be achieved. The objectives priority is based on the overall integrated strategy implementation and specific strategies proposed and shared with the Living Lab participants. In general, it is expected to raise the population' awareness of a renewed approach to the sustainable development and energy transition issues.

The Geodesign tool has never been as important as now, in which the energy and natural resources decrease and the climate change crisis only require sustainable development [28–30]. Geodesign could be introduced into urban and territorial planning university courses, PhDs on the subject must be promoted (as is already being done at the UCS University of Southern California) and it must become a common working practice. People who know how to use collaborative planning tools need to be aware users of Geodesign's potential. The positive feedback received during the workshop from participants highlights the need to make people more aware of the collaborative planning benefits, especially in inland areas.

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