# Training for Territorial Sustainable Development Design in Basilicata Remote Areas: GEODESIGN Workshop

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**Abstract.** GEODESIGN represents an effective framework promoting collaborative planning and decision-making as an incremental process based on robust methodological guidance. In this paper, GEODESIGN has been adopted as supporting tool for preliminary activities oriented to the integrate risks mitigation and sustainable development in a wider research project MITIGO. Within this project, have been selected as case study area four Municipalities from inland areas of Basilicata Region, characterized by several risks (i.e. depopulation, hydro-geological risks, abandonment of traditional land uses…). A knowledge framework process of future scenario building was produced through GEODESIGN Workshop, based on technical information concerning environmental and anthropic risks and combined with more traditional context analysis.

A preliminary experiment of the workshop involving young engineers (in a master degree studio at the University of Basilicata) has been simulated: an useful test to refine details of the analytical framework and to calibrate workshop agenda for real case development avoiding inefficiencies. The results highlithed a comprehensive approach in terms of participation capacity of decision makers without any background in planning disciplines and unveiled the weaknesses of traditional approach mainly based on "building agreements" without any measurements of spatial evidences or scenarios comparisons.

**Keywords:** GEODESIGN · Participatory planning · Decision support system · Strategis design

## 1 Introduction

GEODESIGN represents a suitable framework in order to develop "urban vision" in urban planning practices [1]. Moreover, it demonstrates as a comprehensive methodology a horizontal applicability in any decision process concerning territorial transformation issues. This paper refers to preliminary activities in order to adopt GEODESIGN

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O. Gervasi et al. (Eds.): ICCSA 2022 Workshops, LNCS 13379, pp. 242–252, 2022.
https://doi.org/10.1007/978-3-031-10545-6_17

as a main tool to support strategic design integrating risks mitigation and sustainable development in sample areas targeted by the wider research project MITIGO[1]. In facts, within a multidisciplinary research framework, emerged the need to cover with robust methodology the participatory process in structuring interaction among relevant stakeholders in specific sample contexts. In particular we selected four municipalities in Basilicata Region covering a peculiar territory in Apennine fringe where a high landscape values generates relevant tourism flows based on open-air tourism attractor (The Volo dell'Angelo[2]) but continuous depopulation process and a progressive abandonment of traditional land uses and manufacts generates additional risks condition combined with a critical hydrogeological fragility of the territory [2–8].

GEODESIGN represents relevant research focus for LISUT laboratory and several experiences had been conducted in recent years on selected case studies [9–11]. Mainly we included GEODESIGN among those technical tolls necessary to support planning processes at different scales [12] especially promoting the methodological integration of GEODESIGN with Logical Framework Approach (among others [13]).

According to C. Steinitz [2] GEODESIGN represents an inclusive approach (it involves not only technicians but all actors involved in decision making processes) supporting *"informed negotiation"*.

The specific application of GEODESIGN is not only oriented to consensus building on effective design or strategy, but mainly to generate an extensive learning process addressed to local administrators and citizens. In particular technical information concerning environmental and anthropic risks, combined with more traditional context analysis represents the technical information that through GEODESIGN has to be shared with local people. Based on the awareness of such knowledge framework a process of future scenario building has to be produced through GEODESIGN Workshop. The research actually realized a preliminary experiment of the workshop involving young engineers (in a master degree studio at the University of Basilicata) in order to have a simulated implementation useful to refine details of the analytical framework and to calibrate workshop agenda avoiding inefficiencies. Concerning negotiation, we address this concept in a positive procedural vision of building agreements: GEODESIGN it is not a way to aggregate some strong individual interests against other weakest groups of participants, but mainly a way in which the spatial evidences of decisions (namely "designs" in GEODESIGN taxonomy) becomes a way to make more and more explicit the evidences of individual proposals contributing to the strategic decision-making process.

We place this work in the stream of adopting GEODESIGN for training people, citizens, technicians and politicians in participatory planning as a component for up to date applied research project namely MITIGO.

This paper reports general consideration concerning the advantages in adopting GEODESIGN, discusses details about GEODESIGN workshop organization and conduction. Finally, the discussions and conclusions section report main evidences of the learning by doing process realized and perspectives for the "real case" implementation.

[1] https://www.mitigoinbasilicata.it/
[2] https://www.volodellangelo.com/

## 2 Case Study Area

The four Municipalities selected as case study in Basilicata Region (Southern Italy) are: Albano, Campomaggiore, Castelmezzano and Pietrapertosa (see Fig. 1).

These municipalities have distinguished in two groups (Castelmezzano and Pietrapertosa blue ones and Albano and Campomaggiore green ones in Fig. 1), based on their opposite placement related to Basento river valley.

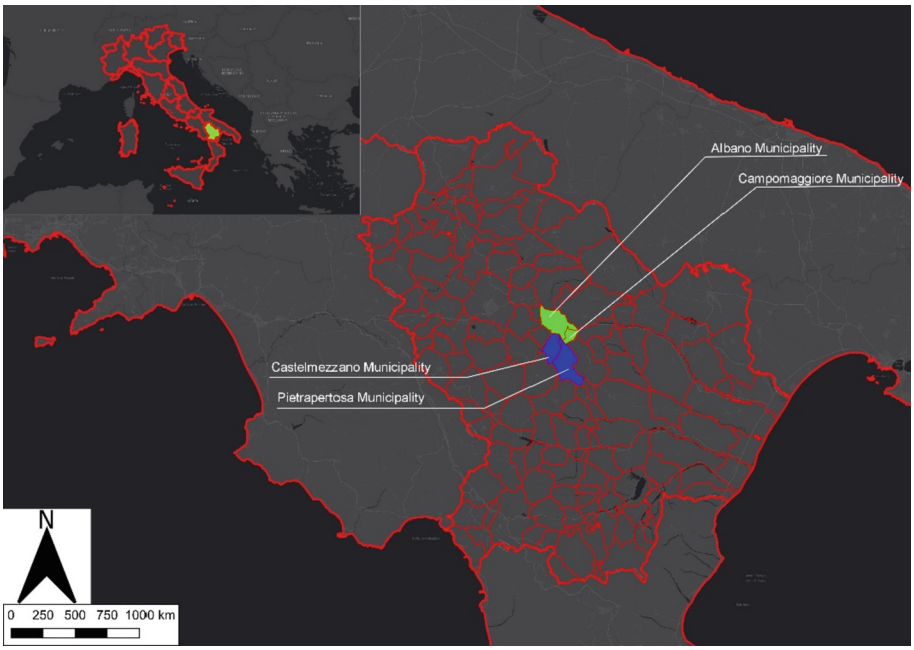



**Fig. 1.** Case study area

Furthermore, Castelmezzano and Pietrapertosa municipalities have a specific tourism specialization based on the "Volo dell'Angelo" tourist attractor that links the two municipalities paced in a unique mountain landscape where dolomite formations arise from the Apennine. The area is part of the "Gallipoli Cognato and Piccole Dolomiti" Regional Park (see Fig. 2).



**Fig. 2.** Landscape of "Piccole Dolomiti" regional park

The ex-ante context analysis of the study area is synthetized in strengths and weaknesses.

- Strengths

  - High naturalness of land: high percentage of forested area on total area per municipality (70–90% of the total municipal territory).
  - "Gallipoli Cognato and Piccole Dolomiti" Regional park: recognized at the European level as protected area
  - The "Volo dell'Angelo" tourist attraction, linking the municipalities of Castelmezzano and Pietrapertosa)
  - Areas with a high landscape value: a part of Pietrapertosa and Castelmezzano municipal territory are classified as landscape assets according to the Italian legislative decree no. 42/2004
  - Specialization of territories in the supply of receptive services: 30% of services and facilities in the study area are receptive services
  - Castelmezzano and Pietrapertosa municipalities belong to the national network of the most beautiful villages in Italy
  - Wide presence in the study area of manufacts of historic-monumental interest, protected by the Italian laws
  - In all of four municipalities there is an elementary school
  - In Albano and Pietrapertosa there are police stations

- Weaknesses

  - Depopulation: the entire study area shows a marked trend of depopulation, with a population loss from 1971to 2020 of 50% and from 2001 to 2020 of 22%. Pietrapertosa has a population decline from 2001 to 2020 of 28%

- Poor accessibility to strategic service nodes: the average travel time by own vehicle from the study area to hospitals and emergency rooms is about 40 min; to university is about 40 min; to airports is about 120 min. Pietrapertosa shows a more disadvantageous condition than the entire study area ( 50 min to the Potenza hospital)
- Inefficient local public transportation: high travel time to main urban center (50–60 min to Potenza). Supply is linked to the needs of the school population
- Residential building equipment is inhabited: the average value of inhabitants per residential building of 1.59 for the entire study area, with slight difference between the municipalities of Castelmezzano(1.31) and Pietrapertosa (1.22) compared to Campomaggiore (2.06) and Albano (2.08)
- Weakness of the productive system: there is a low presence of buildings for industrial use (the most lacking is Pietrapertosa with the lowest percentage of agricultural areas related to the total)
- Widespread conditions of natural and anthropogenic risks: high/extremely high fire risk, landslide risk, hydraulic risk and seismic risk for all of the four municipalities, with greater areas affected in Albano and Campomaggiore municipal territories

A criticality highlighted for all the four municipalities is related to the depopulation phenomenon: the trend in the study area overcome the average rate for all Potenza Province equal to 12% for the period 1971–2020 (see Fig. 3). Indeed, Pietrapertosa municipality has the main population reduction (41%), followed by Castelmezzano (37%), Campomaggiore (33%) and Albano (21%).

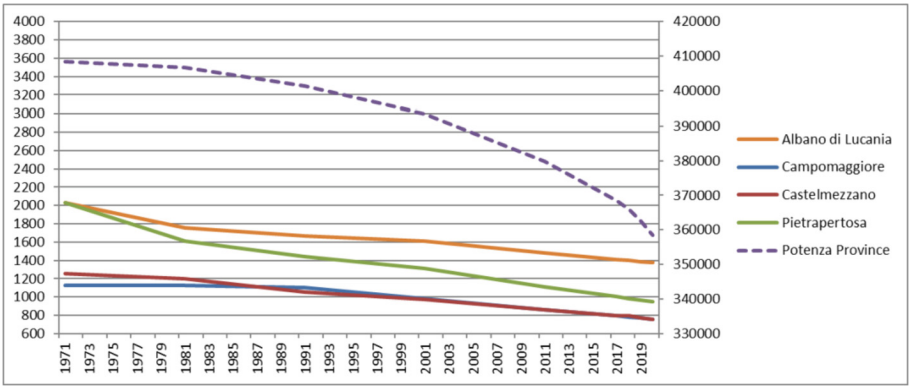



**Fig. 3.** Demographic trend

This represents a structural weakness for the area and therefore a central issue for approaching strategic development design through GEODESIGN Workshop.

Foreign resident population slightly increased over time (see Fig. 4) and it is possible to measure for the period 2003–2021 an increase of about 6%.(15% higher that the average data for all Province of Potenza.

These two population trends identify the issue of social integration of temporary foreign residents combined with the tourism accommodation structure.

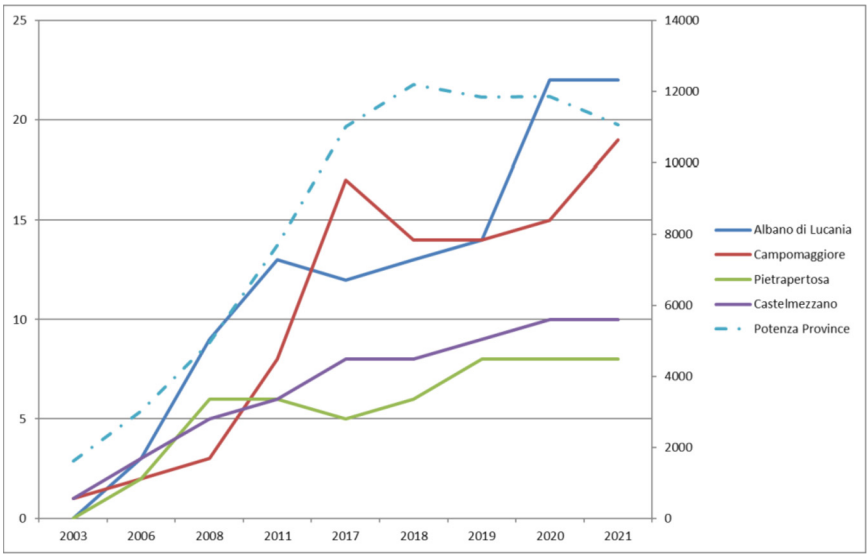



**Fig. 4.** Foreign population trend for the period 2003–2021

The focus on building stock and accessibility infrastructures systems, combined with environmental risks, allowed to point out a second main topic concerning degradations, abandonment, potential isolation for residents' communities. Those relevant topics integrated with the evidences of context analysis represents the input for GEODESIGN workshop.

## 3 The Geodesign Workshop

According with the general methodology, the GEODESIGN workshop is performed by a multi-disciplinary team consisting of planners, field engineers, decision-makers, natural and social scientists and local stakeholders. In this case the experiment was conducted with a specific group of young engineers who assumed different roles to emulate specific competing stakeholders. We place this experience in the group of simulated GEODESIGN workshop oriented mainly to tech through a learning by doing approach the methodology, generating a critical appraisal by participants on the relevant steps of the process and on the benefits of managing interactions in decision making through the "negotiation" approach.

Specifically, the workshop was attended by 8 participants emulating the following stakeholders: tour operator, environmentalist, building contractor, local promoter, mayor of the north area, mayor of the south area, agricultural entrepreneur, student and elderly citizen. These figures cover point of views and competing interests deemed to have a key-role in local development.

The "systems" selected for the analysis and design phase are:

- Green infrastructures
- Energy infrastructures
- Urban settlement
- Cultural heritage
- Hospitality
- Mobility infrastructure
- Agro-food service
- Service supply

Before the workshop session, each working group was contributed to realize the land suitability analysis for at least one system. The evaluation maps was produced on the cartographic bases of the 2013 Technical Regional Cartography including land use data and municipal scale statistics. The consistency of the existing services, as well as the level of infrastructures and the level of hazards in the area, natural beauties and tourism amenities are just some of the features explored.

The systems maps respect the GEODESIGN land suitability rules: i.e. an analytical hierarchy GIS-based approach to classified in detail the suitability degrees for considered land use in the perspective of development scenario. The whole of systems constitutes the base line common knowledge whereby begin planning activities of the workshop (see Fig. 5).

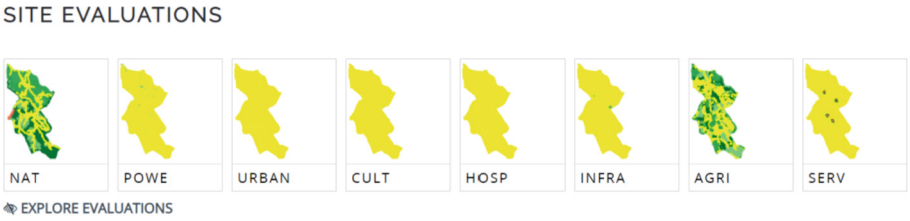
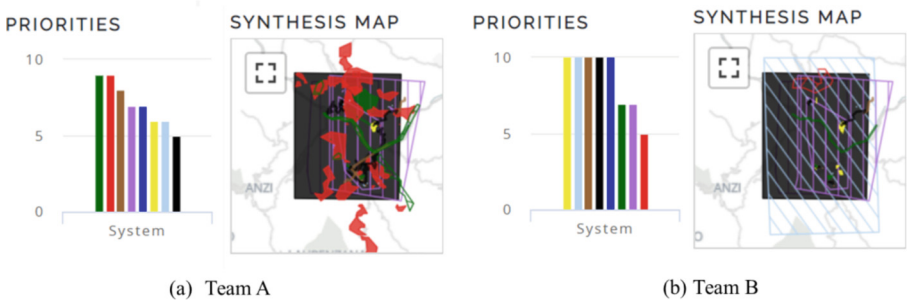



**Fig. 5.** Site evaluations

After the site evaluations, the workshop was conducted with the support of the GeodesignHub web-platform [14] which is useful for both the co-design and negotiation phases. The shared workspace was populated with 103 diagrams divided into 89 project proposals and 14 sectorial policies.

Therefore, the participants were divided into two groups. The first one (Team A) included the student, the environmentalist, the agricultural entrepreneur and the tour operator. The second one (Team B) contains the two mayors, the local promoter, the building contractor and the elderly citizen. Each group defined priorities and made a synthesis of the diagrams (see Fig. 6).

This selection enabled us to proceed with the negotiation phase and the development of a final shared strategy. The resulted vision of territorial development (see Fig. 7) that emerged was more comprehensive than the individual summaries. It can be understood as representing the organization of the territory through an inter-systemic proposal, thus




(a) Team A (b) Team B

**Fig. 6.** Team priorities and synthesis maps

developing synthesis that bring together ideas from every stakeholder and a deep analysis of the spatial characteristics.

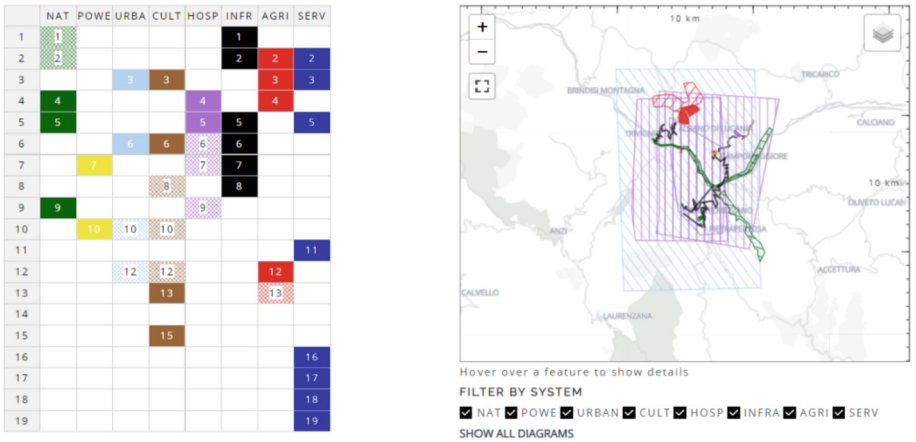



**Fig. 7.** Negotiated design

## 4 Discussions and Conclusions

The preparatory phase of GEODESIGN workshop previously described allowed the research group to point out critical issues in the strategic design: consistency of service stock in the area [15–17], alternative specialization for each municipality collective services providers, maintenance and restoration of cultural patrimony for tourism development purposes [18], the security of intermunicipal mobility infrastructure [19–21] as a precondition of local development. It is remarkable how the debate during the workshop did not consider the natural territorial components as a domain of priority interventions. Thus, probably depends on the general awareness that the naturality degree was not under pressure and it represents an available territorial value to exploit according with sustainable principles [22–26].

On the methodological point of view, GEODESIGN represents a robust framework to be adopted as a Decision Support System in planning [27].

Concerning participants satisfaction, the level of personal-learning derived from workshop development gathers a generalizes positive remark: participants (mainly politicians) declared appreciation toward the process organization and their exante expectations was almost covered at the end.

Next step of the research regards the proposal of the workshop to real stake-holder connecting this studio experience to real-case decision making processes concerning urban transformations, risks mitigation [28] and green transition [29, 30].

This application is close to the general assessment of the learning experience reported by Albert and Ott [31] for the IGC 2019. Participants learned a lot both concerning the understanding of the case study features and of the methodological background.

Additionally it was once again evident that, during the workshop, the enough time has to be spent to share the problem analysis in order to drive the participation towards relevant criticalities of the place, avoiding the so called "wicked" problems [32] risk in decision making.

**Acknowledgements.** This research was realized in the framework of MITIGO - Mitigation of natural hazards for safety and mobility in the mountainous areas of Southern Italy – a funded project by the European Union - ERDF, PON Research and Innovation 2014–2020.

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