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## A theoretical and methodological framework for the analysis and measurement of environmental heritage at local level

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### Abstract

The study aims to assess the lived experience and the environmental heritage perceived level by residents of an high complexity rural area, and which is, in this context, the role played by production of renewable energies. The paper introduces the concept of rural capital as an effective tool for environmental heritage analysis and measurement. The proposed theoretical and methodological approach allows, in fact, its analysis in order to understand what dimensions related to territoriality are connected to the perceived level of environmental heritage at local level. Translated into operational terms, the methodology has resulted in an empirical analysis of a rural and inner area of Sicily, performed both through the examination of identified benchmark indicators, and through the observation of various phenomena, directly experienced by rural residents, detected by sample surveys that, by using a complex sampling design, allow more accurate estimates, modelled on the contexts. All these results are integrated by a multi-case study carried out by a qualitative survey detected both through desk analysis and in field observation, and through in-depth interviews with stakeholders and focus groups with local actors, all asked to assess in a participative way. The research proves that it is necessary to activate the processes of participation and social learning in order to energy planning of the territorial system, allowing at the same time to protect, preserve and enhance the environmental and natural heritage.

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## 1. Introduction

Within the debate on sustainable development, the energy issue certainly occupies an increasingly important role, because the questions related to the production, distribution and consumption of non-renewable energy sources are among the main causes of unsustainability at different levels governance<sup>1,2,3</sup>.

In this context, the issue calls into question, on the one hand, the relationship between energy and territories and, on the other, the relationship between the different geographical scales within which the local dimension certainly plays an active role<sup>4,5,6</sup>.

A sustainable energy model requires in fact an articulated territorial reorganization, based on the decentralization of production and consumption of energy and the use of renewable energy sources spatially and locally spread through a *place-based* approach<sup>7,8,9</sup>.

In literature, several authors believe this approach an effective level of governance for sustainability and environmental issues, since the objectives, strategies and policy actions should be implemented locally. The aim is to achieve a contextual understanding of the issues and establish effective and efficient forms of regulation and management, also through the introduction of participatory and inclusive governance practices of many local actors involved in the management of energetic and environmental emergencies<sup>10,5</sup>. On the other hand, the interdependence between the energetic and the territorial systems is so deep that it is not possible to imagine a transformation of the first without affecting the seconds, and vice versa<sup>11</sup>.

In this context, if, on the one hand, in the literature were developed several studies in urban / metropolitan areas about the optimization of the relationship between city and new technologies in order to increase efficiency – also in view of the potential for smart energy savings<sup>12</sup> and of the impact on social co-creative ecosystems<sup>13</sup> – on the other hand, for rural areas, focused on the primary sector and in the economic and social decline, problematically emerges the prospect of de-growth which poses problems sharing<sup>14</sup>.

Alternatively, both in the academic field and in the field of design, the territorial aspects on the current energy transition not yet receiving the necessary attention. It seems therefore necessary to find a tool that allows to hold together the spatial, social, geographical and historical aspects energy-related.

The study, starting from the collection of empirical evidence provided by the analysis of the territorial environmental heritage at the local level – which in particular is consisting of all natural elements that are not created by human but rather represent an unlimited gift of nature and the result of the interaction between man and nature itself, represented for example by the utilized agricultural area or by the landscape – and through the application of an analytical model based on the examination of *rural capital*, shows that it is necessary to activate the processes of participation and social learning in order to energy planning of the territorial system, allowing at the same time to protect, preserve and enhance the environmental and natural heritage. These processes enable convenience from an economic point of view, since they generate income; from an environmental point of view, since they promote the conservation and protection of natural heritage; from a social point of view since they generate employment growth, as well as the strengthening of territorial identity and sense of belonging to a place.

## 2. 2. Theoretical framework

In literature, within the debate on the role of the local dimension in relation to sustainability, the attention towards the rural specificities focuses on those that are defined as *repertoires of development*, i.e. the sum of the resources and the characteristics associated with a territory, and that, the territorialist literature identifies, instead, as *territorial mass*, with qualitative and quantitative traits, made by the historical accumulation of *territorialization acts*<sup>15</sup>.

The element that distinguishes these settings, as well as the approach of sustainable livelihood<sup>16,17</sup>, is the interest focused on accessibility to resources which refers to the capabilities approach of Sen<sup>18,19</sup>. In this literature, the crucial question is given, on the one hand, by the awareness of local actors about the allocation of local resources and, on the other, by the relationship between the different local actors, in terms of *networks* which determine the real access to the available resources<sup>20,21,22,23,24,25,26</sup>. The use of the term *network* is a metaphor to analyze and to interpret the processes and the activities that take place in rural areas<sup>27,28,29</sup>.

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