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"Return to the Future" With a Systemic Agrivoltaic Strategy

A Path to Regenerate an Abandoned Rural Village and Revive Agriculture After the Xylella Olive Tree Disease in the Puglia Region (Southern Italy)

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Abstract. This paper examines a rural regeneration project combining a utility-scale agrivoltaic system with an innovative agricultural system involving intercropping olive trees with fodder, medicinal and melliferous crops. The resulting project serves as a potential best practice in the Mediterranean region, particularly in Puglia, southern Italy, where olive groves have been severely affected by a plant disease caused by the quarantine bacterium *Xylella fastidiosa*. The study takes an integrated approach, covering several design dimensions, including agricultural, environmental, ecological, energy, social, economic, and architectural considerations. The proposal to restore the abandoned rural village of Monteruga and revive its vibrant rural economy seems to be a coherent strategy of "going back to the future." The agrivoltaic system is integrated with other relevant components to promote multifunctional development and social innovation by leveraging the production and sale of renewable energy. The agrivoltaic facility's temporary reinforcing action would boost an innovative rural development process, providing an appropriate regenerative response to the catastrophic effects of desiccation and uprooting of olive groves caused by Xylella. Rural regeneration is urgently needed and can be supported by optimized, specifically designed agrivoltaic systems, among other things. A transition period of at least 20 years is required for the associated agricultural system to become self-sustaining, with the option of replacing the agrivoltaic system entirely.

Keywords: Planning & Design Agrivoltaic Systems, Rural Development, Olive Groves.

Abbreviations: PV: Photovoltaic; AV: Agrivoltaic; EU: European Union.

1. Introduction: setting the scene

1.1 A race against the clock

Italy is trying to find a realistic path that will lead to a transition to renewable energy in line with the European Union (EU) targets set out in the Fit For 55 (2021) and Repower EU (2022) packages. The National Energy and Climate Plan (NECP, 2023) sets a target of 65% of electricity from renewable sources by 2030 (and net climate neutrality by 2050). Looking at Italy's annual energy production (totaling over 320 TWh), more than a third (36%) is now generated by renewable energy sources and PV has a share of 28% of electricity production from renewable sources [1]. Of the total target of 131 GW of renewables by 2030, 80 GW is expected to come from solar [2]. At the end of 2022, Italy had a cumulative capacity of 25 GW, which means that to meet its 2030 target, installed solar power will need to grow by 55 GW in just a few years [3]. Despite significant progress, Italy is seriously off track to meet its 2030 renewable energy target.

1.2 Severe pressure on farmland

To achieve these impressive results on time, it is necessary to rely on high-capacity, utility-scale PV systems. This inevitably means large-scale installations. In recent years, the Puglia region has seen an increase in the number of photovoltaic plants built directly 'on the ground', i.e. completely covering the ground, leading to a worrying conversion of land use from agriculture to energy. This is now considered unsustainable and is no longer allowed. When it comes to building new PV installations in agricultural areas, the only acceptable solution is now AV. In any case, PV installations in the Puglia region have been more ‘aggressive’ than in other Italian regions, both in terms of the absolute number and size of PV systems and in terms of their relative incidence on the land, i.e. surface density (Figures 1 and 2). In addition, from 2010 onwards, the majority of these installations (70%) have been implemented with PV systems directly ‘above ground’ (Figure 3). This type of implementation has led to general discontent, public protests, conflicts, a crisis of social acceptance and an ideological dispute between environmental organizations (Figure 4).

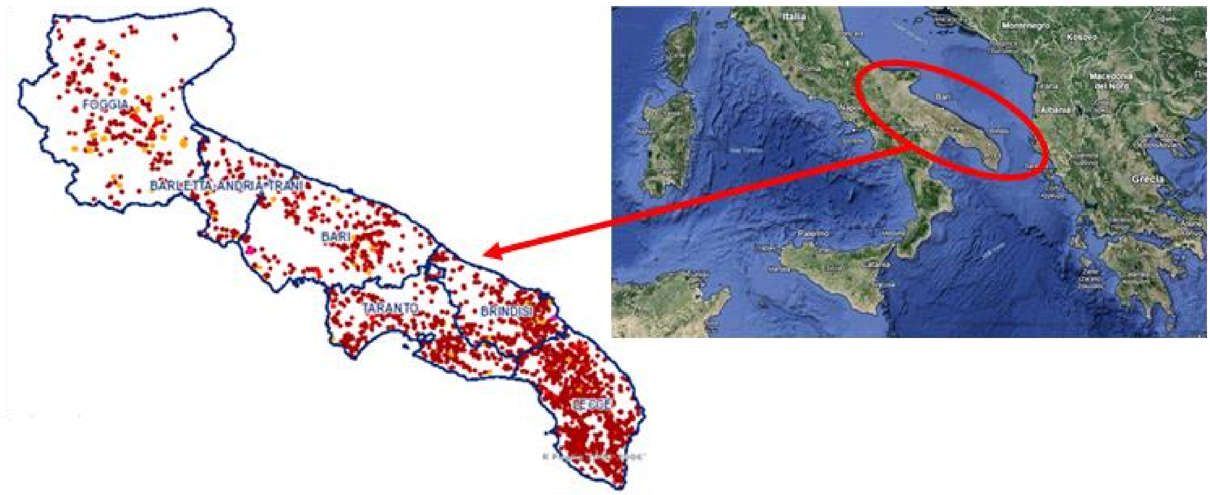

Figure 1. *Map of the Puglia region (Italy) showing the high PV density. Large PV plants with a strong impact on the landscape characterize the extreme ‘heel’ of Italy [4].*

1.3 Farmland abandonment: the rural village of Monteruga as a case study

In recent decades, agricultural abandonment has affected large areas of the EU. This is largely due to the decline in the viability of extensive (low input) and smallholder farming systems.

Some areas of the Puglia region are particularly affected by this socio-economic crisis, which has its precursor in marginalization. In southern Puglia (Province of Lecce or Salento), some olive groves are characterized by occasional and irregular cultivation, while others are completely abandoned.

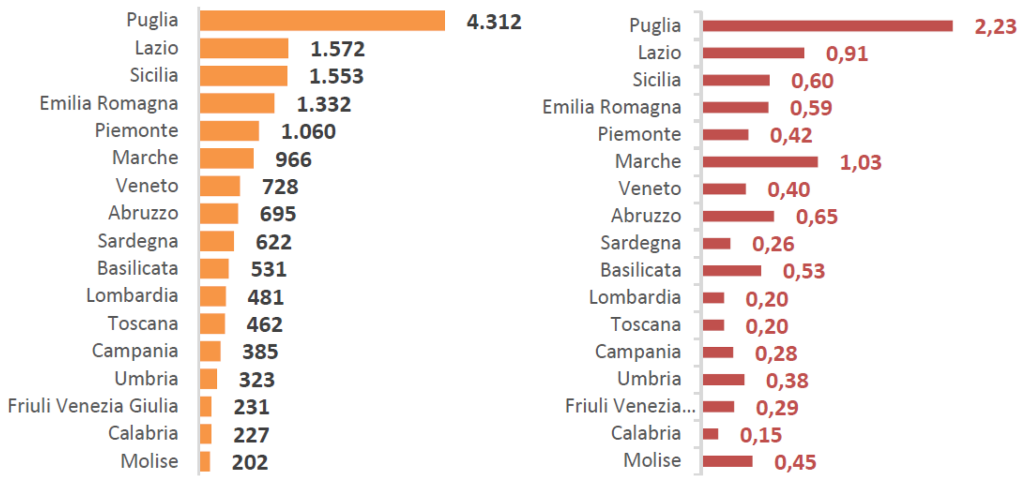

Figure 2. *Compared to other Italian regions, Puglia offers the highest absolute (A: units =hectares) and relative (B: units = PV hectares per 100 hectares) incidence of photovoltaic installations [5].*

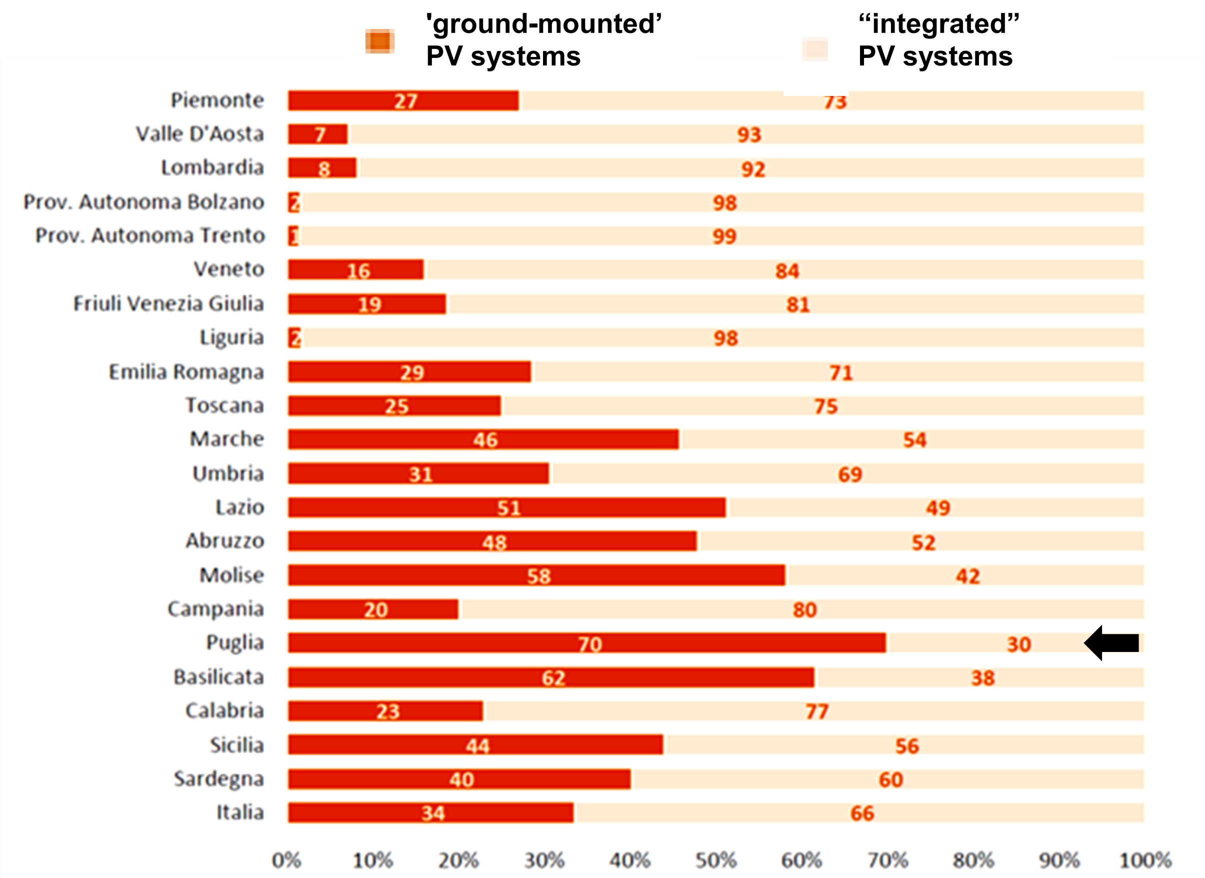

Figure 3. *Puglia is the Italian region with the highest proportion of 'ground-mounted' PV installations [5].*

Figure 4. *Protests against PV plants in Italy by citizens, especially farmers' organizations.*

The rural village of Monteruga (province of Lecce) is a truly representative example. In the 1920s, the Arneo geographical area underwent what is known as ‘integral’ reclamation, which, in addition to hydraulic drainage and land clearing for cultivation, included the construction of roads and rural buildings and the gradual electrification of the area, leading to the creation of a rural community in a newly built settlement with several residential and public buildings (church, school, warehouses, silos, agricultural industries, etc.) under the management of the SEBI company (Electricity Company for Land Reclamation and Irrigation.). What was originally an unhealthy and desolate marshland, with poor grasslands, meagre pastures, sparse wild olive trees and Mediterranean shrubs, was laboriously transformed into agricultural land, where olive groves and vineyards were combined with herbaceous fodder crops (alfalfa) or industrial crops (tobacco). This led to a gradual increase in the number of farm workers and their families who settled in the newly born village, and to the flourishing of agricultural production and processing activities (Figure 5).

Figure 5. *The rural village of Monteruga in the 1960s. The flourishing of agricultural production and processing made it possible for farm workers and their families to settle in the area as a large community. A school, a church, farmhouses, warehouses, silos, etc. allowed for a lively social life.*

After the first decades of growth, the emergence of an industrialized agricultural model, the increasing intensification of cultivation and the greater competition in a globalized market scenario led to the gradual marginalization of agriculture in this area, which was reduced to the sole practice of extensive olive cultivation, a relatively undemanding tree crop. The 1980s saw the gradual abandonment of all agricultural activities and the rural village. As a result, the buildings and infrastructure began to deteriorate. The area is now a ‘ghost town’ (Figure 6).

Figure 6. *The 'forgotten' rural village of Monteruga is now a desolate ghost town, its buildings completely abandoned and in ruins.*

1.4 The destruction of olive groves by Xylella fastidiosa

Since 2010, the Salento area (south of Puglia) has been affected by an initially unknown, but rapidly progressing and spreading disease of olive trees. At first, it was localized, but very soon (2013 onwards) the strange ‘illness’ spread far and wide. In short, what at first seemed to be a manageable problem turned out to be a serious phytosanitary emergency that, in the space of a few years, has affected large areas of the Salento, spreading quickly to the neighboring provinces. It was soon confirmed that the rapid desiccation and death of the olive groves was due, among other possible causes, to the action of a dangerous quarantine bacterium, *Xylella fastidiosa pauca*, as the main etiological agent. The disease was given the name OQDS (Olive Quick Decline Syndrome) [6]. *Xylella* has infected, till now, more than 21 million olive trees, a disaster that has left behind a ghostly scenario, with more than 8,000 square kilometers of infected area, equivalent to 40% of the Puglia region [7]. The damage caused by *Xylella* is not only impacting on the entire olive oil production sector but also the environment, the landscape and the renowned tourism sector. The entire affected area is reduced to ghostly stretches of dead trees (Figure 7).

Figure 7. *A striking image of completely dead trees, attacked by the bacterium Xylella fastidiosa, which caused them to dry out rapidly. The extent of the damage has brought the entire Salento olive oil sector to its knees. The consequences are not only economic, but also environmental, as the traditional landscape of green expanses of vegetation has been dramatically affected.*

The economic damage is therefore incalculable when all these aspects are taken into account. Monteruga was also completely affected by this ‘wave’ of destruction caused by *Xy-*

lella, which led to the death and the consequent uprooting of all the olive trees, thus fully completing the previous destruction (Figure 8). The weird thing was that in August 2023, the Superintendency of Archaeology, Fine Arts and Landscape declared Monteruga a site of outstanding cultural interest, thus protecting the built-up area and a 500-metre buffer around it. It was probably too late, but it could mark the beginning of a possible new phase in Monteruga's history, a possible age of recovery and regeneration.

Figure 8. *The olive groves of Monteruga before (A) and after (B) the Xylella epidemic. The olive trees today have been completely uprooted.*

2. The approach taken: an integrated, multidimensional vision to overcome conflicts and promote a regenerative process

We are therefore faced with the unfortunate situation of an immense reduction in the area previously devoted to olive growing, at the very time when we need to invest as much as possible in the implementation of renewable energy systems, particularly PV. This would normally lead to a simple substitution of the weaker sector (agriculture) for the stronger one (renewable energy). However, this is unacceptable because it would also mean sacrificing the history, culture, landscape and sense of place built up over centuries by the local rural population, who are already leaving and abandoning the countryside. How, then, is it possible to reconcile two different and contradictory processes: the need to increase the number of PV installations in the area, on the one hand, and the need to regenerate a rural landscape that has always been characterized by the presence of the olive tree, on the other?

We faced this challenge in developing the project... complex solutions to complex problems. Wherever different instances are contested because of conflicting beliefs and values, there is room for a more inclusive and participatory approach to planning and design processes. Post-Normal Science (PNS) dates back to the 1990s and was developed by Funtowicz and Ravetz [8,9] as an approach to integrating technoscience, society and policy. According to PNS, most of today's environmental problems, including the crucial issue of the 'rapid desiccation' (OQDS) of olive trees in Salento and the conflict between renewable energy, agriculture and landscape, four distinctive conditions can be identified: a) the facts are uncertain, difficult to control and managed b) the values under consideration are conflicting, c) the decisions to be taken are urgent and d) the stakes are very high. The complexity created by the coupling of apparently contradictory choices leads to uncertainty and, in the most extreme cases, to paralysis and conflict between parties in irreconcilable opposition because they are based on very different value positions, although both are fully legitimate. The only way out is to overcome the imposition of one choice at the expense of the other and to achieve a new, unprecedented synthesis, a kind of 'quantum leap', a new alliance. Is this possible? If so, is this feasible? The challenge is to go beyond simple prescriptive technological applications and professional consultancy to broaden the group of peers involved in the planning/design processes; a multiplicity of legitimate perspectives are taken into account and the participants in the process form an 'extended peer community', sharing the work and arriving at a solution to the problems through debate and dialogue (co-designing process, far beyond a multidisciplinary approach). This is what we have learnt from PNS, its conceptualization and comprehensive 'problem-solving' strategy. This is what has been applied in our planning/design processes.

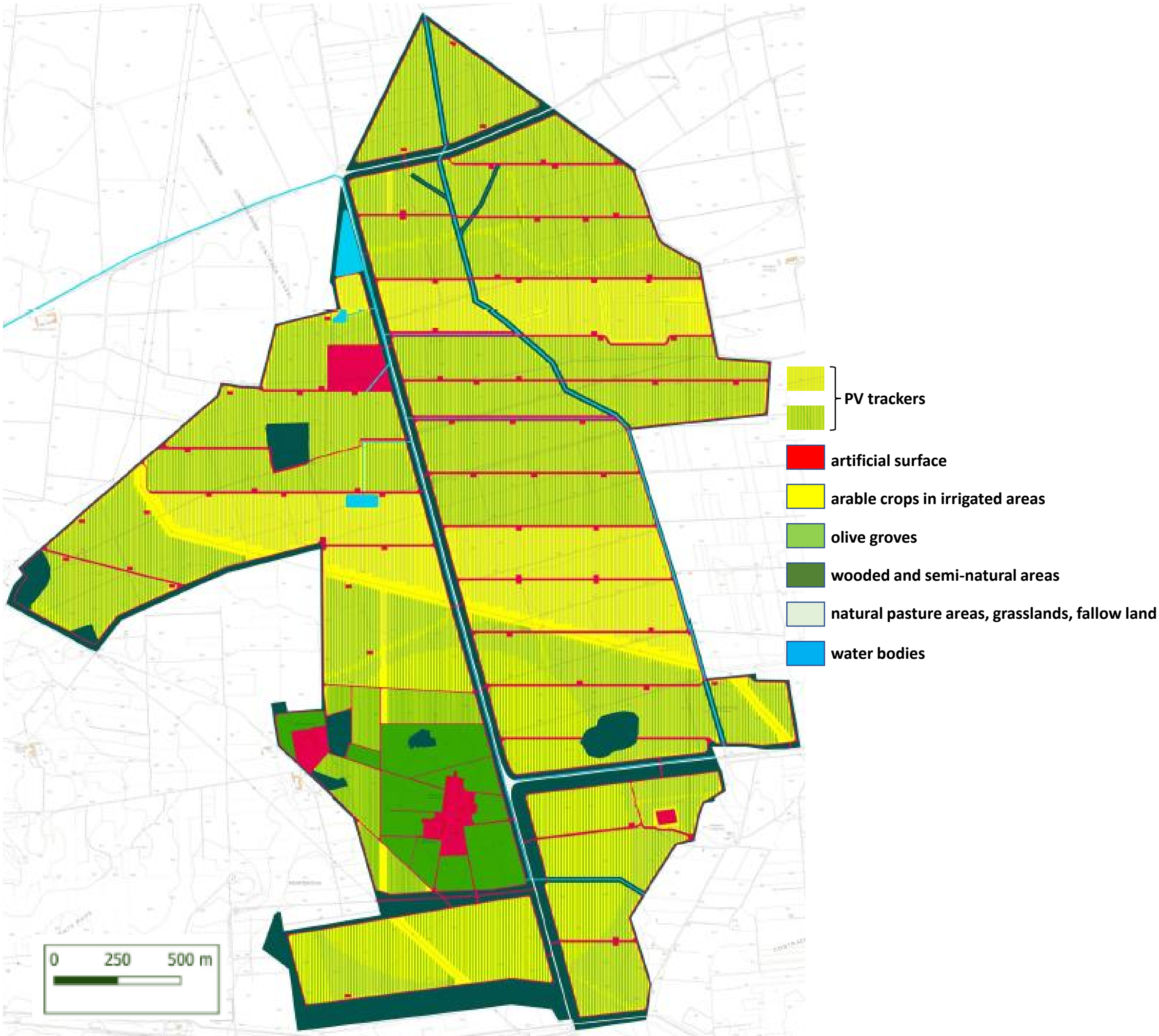

Figure 9. *The general planimetry of the AV design.*

Therefore, an integrated AV project was conceived also having as an essential reference the whole policy framework of the European Green Deal (and not only the 'energy' strategy). The principles of a comprehensive spatial planning process have been discussed and considered in the development of the project. The first level of this integration should be a strong and positive interaction between agriculture and energy through an AV system. In addition, the project must harmoniously integrate a wide range of diversified components so that the AV system becomes the 'pivotal' component of a systemic rural innovation model that considers renewable energy production as a driver of community development. This can be considered as the 'mission' of the project. In this respect, the leverage effect of AV in promoting rural development could even be seen as temporary, i.e. in the timeframe of about 20 years, approximately the time needed to achieve the maximum return on investment. AV should be able to provide a boost and act as a flywheel to support rural processes that need time to become self-sustaining after a reasonable start-up period. If rural development is to be the objective, then AV activities are instrumental to the objective and are not considered 'per se'. A precise integrated AV project should consider the crucial social, economic, environmental, and ecological implications, possible landscape concerns and adaptations, and architectural implications for restoring historic rural buildings and infrastructure.

3. The Monteruga regeneration project

The Monteruga AV park will provide 291.33 MWp of peak power, with double-sided 600 W modules and 50 MW storage. The investing promoters are 'Masserie Salentine' (the agricultural company) and 'Energetica Salentina' (the photovoltaic company). The total area available is 588 hectares, while the total area of the AV plant is about 420 ha (Figure 9).

Farming structure and agriculture activities. Concerning agricultural activities, the project aims to promote renewable energy generation in synergy with sustainable agricultural practices, avoiding land use change, improving soil fertility and soil carbon stocks, and applying agroecological management to agriculture. In addition to olive growing, it includes an innovative fodder value chain, beekeeping and bee-derived products, and local agro-industrial processing facilities. The project focuses on intercropping high-density, hedge-like olive groves with fodder or medicinal plants as companion crops. For the main crop, olive trees are planted in hedges along the center line between the trackers, 12 meters apart. On either side, fodder crops or medicinal plants, depending on the soil suitability, are also cultivated to completely and permanently cover the soil, except for the strip immediately adjacent to the panel support. A maximum width of half a meter on each side of the bearing rod is not covered by cultivation (Figure 10).

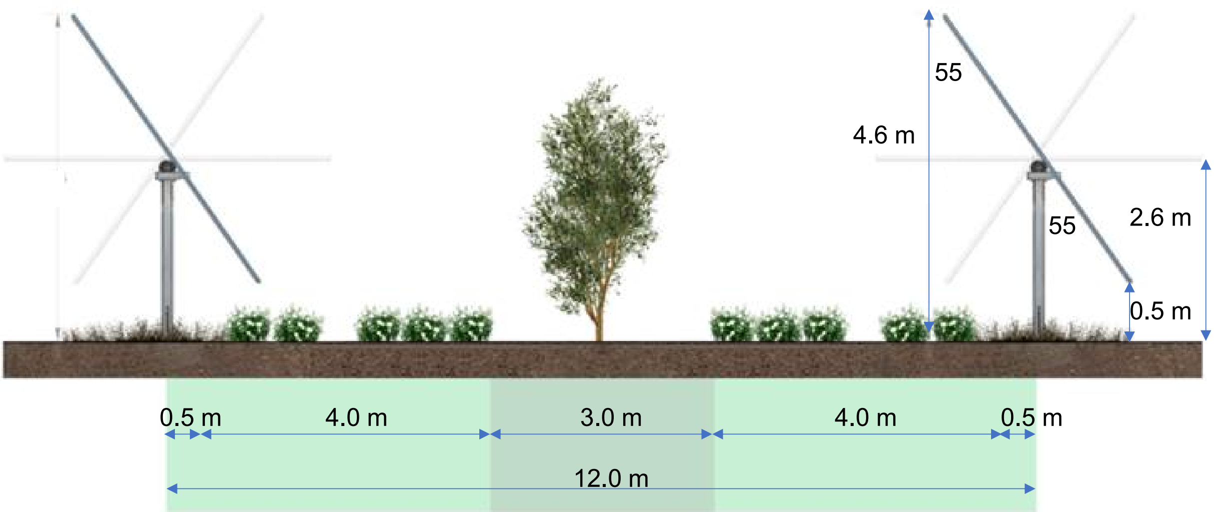

Figure 10. *Layout of the AV system. The trackers are spaced 12 meters apart. Olive trees are planted in hedges along the center line between the trackers. Other herbaceous crops are grown in the remaining space up to the trackers (fodder or, alternatively, medicinal plants).*

AV layout and microclimate optimization. A microclimate analysis was carried out by comparing several simulations obtained by applying a fluid dynamics model. This physics-based, deterministic model allowed the optimal configuration (or layout) of the AV system to be implemented, with particular reference to the distance between the trackers and the height of the PV panels. The panels, oriented in a north-south direction and equipped with a uniaxial sun tracking system (i.e. adjustable tilt throughout the day), placed at a distance of 12 meters and an average height of 2.60 meters, allow the best irradiation conditions of the olive grove, i.e. the highest number of irradiation hours compared to configurations with closer tracker spacing and higher panel heights [10]. Under these conditions, not only the potential shading of the panels is minimized, but the radiation and microclimate regime that characterizes the olive grove canopy allows the best quantitative and qualitative development of the drupes, which in turn benefits the quality of oil production.

In the AV configuration, the herbaceous crops will cover an area of approximately 420 hectares. Beekeeping will also be carried out by setting up an apiary with 60 hives. The bees will also visit the plants insisting on the natural ecological networks within and between the AV system, where about 75 hectares of Mediterranean scrub will be restored. A localized low-pressure subirrigation system supplies the olive trees with water, only in the summer and according to a planned water deficit schedule (no more than 2,000 m^3/ha throughout the season). The herbaceous crops are irrigated by sprinklers, again only in summer and according to strict water-saving criteria. Limited but highly efficient water use is essential in a Mediterranean climate where water availability can be a critical environmental factor and where soils show salinization problems and display desertification trends.

The resulting agricultural system is highly diversified in its structure and functioning, which significantly increases its adaptability to the effects of climate change. The three main principles of conservation agriculture (minimum soil disturbance, crop diversification, and permanent soil cover) will be applied to protect the environment and to reduce both the impacts of climate change on agricultural systems (adaptation) and the contribution of the agricultural practices to greenhouse gases (mitigation). Very few and limited mechanical soil treatments and continuous soil cover can improve soil quality and its carbon stock potential; an innovative fodder value chain with a potentially large market, together with medicinal plants and herbal products, can significantly improve crop productivity and the economic viability of farming, complementing the income from olive growing; another environmental outcome is the protection of bees and other pollinating insects, which is closely linked to the production of honey and other bee products; this latter is another viable economic diversification activity; finally, an agroecological approach to farming, which aims to minimize the environmental impact of agriculture and fully respect biodiversity, can ensure sustainability and long-term agricultural management.

Ecological restoration. The project combines environmental mitigation, compensation and optimization measures into a unique, integrated strategy for the ecological improvement of the area. Mitigation measures are those directly related to the reduction of specific environmental impacts. Compensation measures aim to improve the overall environmental conditions. Optimization measures concern the best possible adaptation of the project through specific solutions. The mitigation measures include the creation of buffer strips of shrubs and trees around the perimeter of the solar farm area and along the banks of the major watercourses. Their function is to provide visual screening, an ecological corridor and green landscaping. Different vegetation modules have been designed in different sizes, wider and taller, more species-rich or smaller, depending on their specific location and function. Optimization measures include the restoration of woodland by improving existing wooded areas and creating new areas of Mediterranean shrubs, bushes and garrigues. The project also includes, as compensation measures, the restoration of approximately 21 hectares of uncultivated semi-natural steppe grassland, which will be used for extensive grazing. Grazing and transhumance are human activities that have characterized the area for centuries, as evidenced by the 'Riposo dell'Arneo' (a resting herd pasture), the extreme southern part of the interregional sheep track system. This important area is strictly adjoining the property and is now recognized as a listed landscape asset in the Puglia Regional Landscape Plan [11]. It should be remembered that the ancient system of sheep trails, the 'green trails' once used for transhumance, have recently been included in UNESCO's intangible World Heritage List.

In total, the project planned an increase of 1.36 ha of garrigue, 7.14 ha of scrubland, 21.20 ha of steppe grassland and 23.00 ha of holm oak woodland. All this considered, the main objectives are to provide optimal integration of the AV facility into the existing ecological mosaic, to enhance current environmental assets, to increase their spatial distribution and to improve the provision of ecosystem services. The specific objectives are to strengthen existing ecological niches, activate or maintain ecological corridors in the project area, connect them to the regional ecological network, conserve, restore and enhance habitats and species, strengthen the ecological mosaic and create ecosystems with buffering and filtering functions. This will benefit not only wild biodiversity but also agriculture itself, which will be carried out in a more balanced and robust environmental context.

Cultural, educational and training activities. Attention will be paid to the promotion of the olive oil industry, which will be the main agricultural value chain to be supported. Warehouses will be built (by renovating old ones) and machinery for processing agricultural products will be installed. The equipment to be installed will concern the olive oil sector, the conditioning and packaging of fodder, the extraction of honey using natural methods and the drying of aromatic herbs. The creation of a museum is also planned; the museum's activities will include permanent exhibitions on the history of Monteruga, the traditional methods of growing and caring for tobacco, and the very old methods of milling olives to obtain oil. Specialized training courses will be offered to qualify AV technicians, on both agronomic and energy techniques. The Puglia Region will certify this training as part of a newly planned two-year higher technical training course (Higher Technological Institutes - Academy) legally recognized. These courses will be run in close collaboration with companies in the AV sector.

Architectural renovation of buildings and infrastructure. The recovery of a large area of old rural buildings, today in a complete state of abandonment and decay, is an essential part of the project. These renovation works will be very demanding and will require a significant initial budget. These funds are not available from the public authorities but can be requested from the private investor as part of the project compensation for the benefit of the community.

Today Monteruga is only visited by a few tourists because it has the charm of a completely abandoned village. Shortly, the real attraction will be the complex of activities that will revitalize the village. A guesthouse and restaurant will be built in the hamlet, along with a farmers' market selling local produce.

4. Monteruga as a pilot: the overall planning conceptualization

4.1 Strategic lines of development

The strategic vision of the project is based on the concept of agricultural ‘multifunctionality’, so crucial in the European CAP (i.e. Common Agricultural Policy). This integrated, multifunctional AV project should satisfy and reconcile all the interests at stake, thus stimulating an effective ‘refunctionalization’ of the area involved in the AV investment.

- From a spatial planning perspective, the project's strategy focuses on revitalizing agricultural activities by fostering a new and enhanced cycle of ‘reterritorialization’. This involves recomposing and reorganizing the territorial space by setting in motion a mix of innovative processes. Recursive and circular processes of territorialization-deterritorialization-reterritorialization are always at work and underlie the landscape's construction and the connections people make with their environment. Territory is deterritorialized when it is involved in a ‘line of flight’ that leads to its progressive decay [12]. Reterritorialization will therefore consist of the attempt to recompose, reaggregate and reorganize the territorial space through innovative processes that identify new functions or recover lost ones through their modern re-proposition. This is precisely why we speak of ‘returning to the future’ (also referring to ‘retro-innovation').

- From a rural development perspective, the concept of agricultural diversification can be useful in understanding the project approach. ‘Diversification’ refers to rural activities such as agrotourism, agroenergy production, biodiversity conservation and natural resource management (the so-called ecological services) that can be effective in revitalizing the rural milieu. According to the seminal work of van der Ploeg [13], the process of farm transformation can follow three different directions: a) deepening of agricultural value chains, b) broadening of farm functions and activities; c) regrounding of farm processes by a different set of resources and/or involving new patterns of resource use. All three lines of rural development are implemented in the project.

- From a biodiversity conservation perspective, a 'land sharing' rather than a 'land sparing' approach is proposed for the conservation of wild biodiversity. This is fully in line with the concept of the Natura 2000 network, the large-scale ecological network established at the EU level. A 'land sharing' approach, as opposed to the 'land spearing', focuses on an agricultural model that is closely linked to, and conducive to, the conservation of wild biodiversity. This is also known as an ecological intensification of agriculture. Given local conditions, this approach has been proposed for use in our planning process.

4.2 What Monteruga is teaching us

The case of Monteruga is a concrete example of the possible regeneration of a rural village that has been completely abandoned for decades, only to become viable thanks to the boost provided by the operation of an AV plant. In the province of Lecce in particular, the almost total uprooting of olive groves following the *Xylella fastidiosa* epidemic is the most serious agroecological problem ever recorded in the area. We would describe the project as a 'reasonable' hypothesis for the reactivation of a rural economy, the architectural regeneration and the reshaping of the landscape. The proposal of an AV plant would allow a 'reterritorialization' by achieving a virtuous integration between agricultural and energy production processes, which would have the prerogative of generating positive environmental and ecological spin-offs in this particular territorial context. The replanting of olive trees with new varieties resistant to *Xylella*, but grown at high densities and in the form of hedges; the cultivation of fodder, officinal and melliferous species and bee-keeping activities would create new and promising production chains, also following the establishment of agrifood processing plants on site. A wide range of other activities are planned to create a multifunctional agricultural model to support the local economy. In the long history of human interactions with nature, it is possible to assume a kind of ecological succession of the landscape, influenced not only by the unfolding of natural forces but also by human action in this specific environment. This succession is not unidirectional; it shows evolutionary routes of escape, but also retreats. It is a constant alternation between 'territorialization' and 'deterritorialization'. Territorialization is a process of organizing space to make it more functional for human needs, to establish spatial connections and relations, and to configure it by achieving a new, more complex and evolved territorial status. Conversely, 'deterritorialization' implies degradation and abandonment, the loss of the given organization and configuration of space, the thinning out of links and the alteration of functional relationships due to a crisis, the overcoming of limits, a mutation or change in reference models (productive, social, cultural, etc.). After this disruptive phase, however, a phase of 'reterritorialization' can recur to reconstitute a regenerative process through which a new and further configuration of the territory is gained, new relations, new bonds, and new ties are established based on a new reference model. These are therefore recursive transitions; each territorialization requires a certain degree of openness (to the new) and an appropriate degree of closure (to protect the original status of the system). A key and relevant aspect of the infinite cycle of de/re-territorialization is that of activating processes of re-functionalization and reconfiguration of the landscape, as historically defined, transforming the obstacles, criticalities and conflicts inherent in the *ex-ante* condition, into a new path of energy transition and new forms of available energy to be used, into opportunities to rethink the process also in terms of increased democratic participation (integration of new needs, perceptions, practices, policies, etc.). For all these reasons, Monteruga is much more than an AV project, is a planning/design prototype concept to be replicated on a large scale.

5. Conclusion

The reclamation of the Arneo area (province of Lecce) and the modernization of agriculture through the use of electricity took place between 1924 and 1933. In 1925 the SEBI was founded, which promoted an ambitious project in Monteruga. The economy of the 600-hectare village flourished until the 1970s, when it began to decline, leading to the gradual abandonment not only of the rural settlements but also of all economic and productive agricultural activities. Only the olive tree remained, a rustic plant that does not need much care. Today the rural village is a 'ghost town'. Despite the recent historical-cultural protection imposed by the Superintendency of Archaeology, Fine Arts and Landscape, abandonment and negligence are degrading the buildings, while the surrounding countryside is now a veritable 'desert' for miles around, following the complete uprooting of all the olive groves.

A multifaceted regeneration project has been proposed and is ready to be implemented. The AV system is its 'pivotal' component. A new cycle of reterritorialization should be initiated to promote rural development for the benefit of the local community. A new landscape configuration is likely to change the traditional relationship between people and their place. A new '*genius locus*' should be gradually developed.

Xylella is still a problem. We have overcome the emergency of its massive spread and today, in addition to threatening neighboring geographical areas, it is an endemic pathogen that must be controlled by preventive tools and, above all, by the use of resistant olive tree varieties (which are now gradually being adopted by olive growers). The ecological diversification of farms (an essential component of the AV project) works as a mitigation strategy that should also be considered in terms of pathogen control and prevention of new epidemics. The previous continuous canopy cover of olive groves made them very susceptible to *Xylella* and such a pattern should now be avoided through crop diversification, both within and between farms, which acts as a barrier to *Xylella* and other pests.

National legislation and regional regulations on specific types of land suitable for the installation of renewable energy systems will be discussed and approved shortly. PV systems on agricultural land will only be allowed under the AV form. The aim is to reconcile PV installation and agricultural land use. What we are proposing here is not simply an approach to the design of PV projects, but rather a strategic view and a much broader operational path to generate social acceptance by promoting the socio-economic development of still-existing rural communities, new ecological forms of agriculture and food processing, and innovative actions to protect wild biodiversity.

What is passed on from one generation to the next becomes 'tradition', a sign of the success and stability of certain solutions that effectively combine the availability of resources with the needs of society at the time. Needs evolve and the resources available may change. In order not to betray the 'tradition', it is necessary to 'translate' it in such a way as to keep it alive by giving it new purposes in new contexts.

Are we so sure that we are not laying the foundations of a (new) 'traditional' agricultural landscape for the third millennium? It is up to us to keep a watchful eye on the modes and qualitative effects of this land transformation.

Data availability statement

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Author contributions

Author Contributions: Conceptualization, M.M. and E.G.; methodology, M.M.; formal analysis, M.M.; investigation, L.P., M.I. and M.G.; writing—original draft preparation M.M.; writing—review and editing M.M. and E.G.; funding acquisition, A.T.; investigation and resources, L.B., B.M., C.P., and C.T.; supervision and validation A.T.; All authors have read and agreed to the published version of the manuscript.

Competing interests

The authors declare that they have no competing interests.

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