



Reclaiming the River

Ecological restoration in the Simeto Valley

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Abstract: This report, developed within the Horizon Europe BIOTraCes Project (Biodiversity and Transformative Change for plural and nature-positive societies), examines socio-ecological processes affecting biodiversity and their potential for transformative change in the Simeto Valley, eastern Sicily. The Simeto River, the island's largest yet most neglected hydrographic basin, is a key site for investigating the intersections of biodiversity, livelihoods, governance, and democratic participation.

A central concern is that biodiversity protection depends on recognition and exclusion: who is enabled to act, whose voices remain marginalised, and which practices and knowledges gain visibility. Biodiversity is thus approached not as a purely ecological issue but as the relational outcome of struggles and negotiations across political, cultural, and economic divides.

The report develops along three strands. The first analyses agriculture, irrigation systems, and collective agency, showing how local actors navigate tensions between large-scale infrastructures and small, neighbour-based systems. It highlights conventional monocultures alongside practices that support biodiversity and foster collaboration. The second examines regenerative land-use models, including permaculture and syntropic agriculture, exploring their contribution to ecological restoration, biodiversity enhancement, and sustainable livelihoods. The third investigates alliances between activists and municipalities, particularly through collaborative mapping of photovoltaic and agrivoltaic expansion, documenting how communities contest extractive pressures and foster more democratic decision-making.



Overall, the report shows how biodiversity in the Simeto Valley is both threatened and reimagined through contested socio-ecological practices. It underscores the importance of co-produced knowledge, plural pathways of transformation, and locally grounded forms of governance for nature-positive futures.

Keywords: Biodiversity, Irrigation, Agriculture, Agrivoltaics.

Introduction

Framed within the BIOTraCes Project – *Biodiversity and Transformative Change for plural and nature-positive societies*, this report focuses on diverse research trajectories, socio-ecological transformation, and innovative practices on biodiversity in the case of the Simeto Valley – a wide area in eastern Sicily named after the Simeto River, the island's most important yet largely neglected hydrographic basin.¹ At its core, the project aims to develop theoretically grounded insights and support practical, context-sensitive initiatives for lasting improvement, rooted in place-based expertise shaped through collaborative, culturally informed public engagement (Stirling 2015; Hysing, Lidskog 2021). BIOTraCes raises a series of critical questions: Who is recognized as capable of driving transformative change? Who is left out or remains invisible? Which practices are amplified? And which ones are silenced or pushed to the margins? Investigating power dynamics is essential for rethinking how we live, work, make decisions, and relate to the environment. Biodiversity loss is not merely a biological or technical issue (Tupala, Huttunen, Halme 2022); on the contrary, a concrete and situated reflection on biodiversity requires not conceiving it within the conceptual framework of conservation (Büscher *et al.* 2012) but rooting it in concrete practices (Graddy 2014) shaped by political and cultural systems that privilege certain interests, voices, and ways of knowing over others. The case studies we have conducted within the BIOTraCes project highlight how power operates subtly – embedded in social norms, economic structures, dominant conceptions of knowledge, and related factors. Our research focuses on how different local actors – such as farmers transitioning away from monocultures, permaculture practitioners, local herders, and residents facing environmental degradation and loss of in-

¹ Although the report reflects a collaborative effort, individual contributions are as follows: Erika Garozzo authored sections 2.1 and 2.2; Samadhi Lipari authored sections 2.3 and 3; Domenico Papalardo authored the first sections.

come – interact with biodiversity challenges along the river. Instead of imposing solutions, the project emphasizes co-creation, where knowledge is collaboratively produced through active engagement with these groups. The report is structured as follows. The first section aims to offer a historical, spatial and ecological overview of the case study, while the second section is structured into three parts, each one focusing on one different line of research. The first examines local actors who are promoting transformative change in the valley through social mobilization and participatory activism. The second looks at those developing alternative land use models and new forms of engagement with biodiversity. The third focuses on a collaborative mapping effort, aiming to track and document the rapid and uneven spread of photovoltaic and agrivoltaic conversion projects throughout the valley. The report concludes by synthesizing the key challenges and opportunities identified across these three focal areas, offering insights into the dynamics shaping the future of the Simeto River Valley.



Figure 1. Columnar Basalts (Picture by anonymous)

A Fragmented Waterscape: Socio-Ecological Entanglements in the Simeto River Basin

The Simeto River Valley is a fluvial landscape deeply shaped by the interaction between hydro-morphological dynamics and historically stratified anthropogenic pressures. Agricultural intensification, shifting water management, and more recently energy infrastructures have produced a highly anthropized basin (Saija 2011; Petino 2019). The valley functions as a multifunctional agroecosystem (United Nations 1992), where ecosystem services are tied to land use and management but currently exhibits clear signs of functional degradation.



Figure 2. Simeto River Basin (Map from Bonaccorso *et al.* 2007)

A more in-depth analysis reveals a spatially intricate and highly fragmented territorial mosaic, characterized by significant heterogeneity in ecological features, geomorphology, and infrastructural networks. In the middle-to-upper Simeto basin waters cut through lava formations, exposing columnar basalts and carving gorges along a riverbed that remains largely unchanneled and unregulated over extended sections (Figure 1). Infrastructures include dams and weirs, mostly for flood control and regulated releases, under ENEL's² ownership, which grants the company overriding control superseding the jurisdiction of all other regulatory authority (Figure 2). These barriers introduce longitudinal discontinuities fragmenting the river, disrupting continuity, and creating dry segments (Figure 3).

Downstream, from Ponte Barca weir to the confluence with tributaries, levees and canals from land reclamation works dominate and major barriers are absent³, anthropogenic transformation is primarily expressed through hydraulic regulation, including levees that have significantly altered the river's original course (Figure 4) (Gruppuso, Garozzo 2025). These interventions have imposed a forced rectification of the Simeto's path, confining it within a narrow, low-flow channel. Another defining feature of the lower stretch is the extensive network of irrigation canals developed by the land reclamation consortium (Sorbello 2002; Armiero *et.al.* 2020).

² ENEL (Ente Nazionale per l'Energia Elettrica) Italy's largest energy company, evolved from a state-owned monopoly into a multinational active in fossil and renewable energy. In the Simeto basin, ENEL manages the San Teodoro (Ancipa) and Pozzillo dams on the Troina and Salso rivers, and the Santa Domenica hydroelectric intake, which interrupt Simeto's flow. These disruptions affect downstream sites, including Contrasto, Paternò hydro plants, and the Ponte Barca weir thereby influencing the river's ecological continuity and water availability.

³ In the lower course, along the main stem of the Simeto River, only the Passo Martino weir remains. Although it was originally planned to supply water to the industrial area of Catania, it has never been used for this purpose and now serves no functional role. However, the weir obstructs the river just a few kilometres from the mouth, preventing fish migration and, more broadly, exchanges with the estuary. Its removal would restore the continuity of 36 km of the lower river course.



Figure 3. Santa Domenica water intake (Picture by anonymous)

Today, new transformations arise – large photovoltaic plants are replacing 2,000-3,000 hectares of citrus and grain monocultures. While framed as a green transition, this *silicon monoculture*, although framed as a green transition, introduces industrial elements into rural space, reducing agricultural biodiversity and reshaping land use. The landscape transformation is visible while the impact on the territory is deeper (on territory grabbing see Lipari 2020, see also Ciervo Cerreti 2020 on landscape grabbing): photovoltaic plants appear as dark grey patches disrupting the visual and ecological continuity of the valley. Less visible, but equally important, is the long-term alteration of land use and the resulting decrease in agricultural biodiversity, while benefits remain limited: most investment comes from outside, jobs are temporary, and only about 3% of revenues stay locally (Lipari 2025). Furthermore, due to a fragmented and opaque regulatory framework, local stakeholders often have limited capacity to intervene in zoning or permitting decisions, weakening democratic participation and reducing the ability of communities to advocate for sustainable land use practices (Siamanta 2019).



Figure 4. Left bank secondary levee (Picture by anonymous)

The water infrastructures, implemented from the post-World War II period, enabled intensive citrus farming deeply transforming the area's agricultural system (Calcaterra 1986). Once seen as productive expansion, these interventions are now subject to critical reassessment based on reflection already present in local communities – though never fully translated into concrete actions – and positions BIOTraCes as a catalyst for rethinking water governance considering the Water Framework Directive (2000/60/EC) and EU policies promoting river renaturalization. In this regard, the interventions carried out in the Simeto river represent an emblematic case of loss of river continuity.



Alongside a theoretical division of the river basin into two macro-areas – differentiated by their landscape and infrastructural features – a more layered interpretation is possible that highlights further levels of internal fragmentation. Different reclamation consortia, heterogeneous soils, and uneven access to springs and canals create diverse agroecological conditions even within small areas. This complexity is mirrored in the configuration of deeply heterogeneous agricultural structures, even among geographically contiguous areas. *Contrade*⁴ are historically demarcated yet functionally tied to distinct irrigation systems. This micro-fragmentation shapes social relations as well, producing asymmetric water access and informal networks. Governance is thus challenged by territorial and social heterogeneity, requiring multi-scalar approaches that connect land, water, and social organization.

In this heterogeneous context – characterised by a complex socio-ecological structure and a plurality of actors with often divergent interests – farmers and livestock breeders remain central to the material and cultural relation with the river. Their practices reveal a need for sustainability principles rooted in local conditions: protection of biodiversity, adaptation of practices to cycles and terrains, valorisation of traditional knowledge, active participation, preservation of cultural landscapes, and hydraulic structures aligned with ecological dynamics. Given the agricultural vocation of the area, sustainability entails not only maintaining productivity but rethinking monocultures and extractive models. This integrated framework is essential to safeguard the multifunctionality of agroecosystems and to ensure the long-term sustainability of the basin, thereby addressing and overcoming the fragmented and unsustainable management approaches that have historically compromised the socio-ecological equilibrium of the valley. However, the implementation of such practices is significantly hindered by the highly fragmented governance of the river basin, which involves a multitude of actors whose policies and practices directly shape the environmental configuration through competing forms of water and land management. Within this complex framework, conflict does not simply unfold between neatly defined stakeholder groups but rather emerges from the intersection of heterogeneous interests and positionalities.

Water and land are managed by multiple, often competing, actors: small-holders dependent on seasonal hydrological flows, medium-to-large-scale

⁴ *Contrade* are historically rooted sub-municipal units tied to rural names and dispersed settlements. They combine material elements – roads, land parcels – with immaterial ones like memory, practices, and identities. In the Simeto basin, they are defined not only by history and boundaries but also by dependence on specific water infrastructures. Agriculture and pastoralism are regulated by uneven canal, intake, and reservoir operations, hindering unified basin management.

landowners with historic privileges, breeders navigating an increasingly constrained terrain, and new inhabitants – young people engaging in agriculture with alternative techniques and values, often oriented toward agroecology and territorial regeneration. The land reclamation consortium plays a strategic and ambivalent role, mediating water distribution while also asserting institutional authority.

Public bodies responsible for basin management operate alongside environmental organizations advocating for ecological integrity, while the river itself – understood as a living entity and relational agent – is increasingly recognized as a subject of care by local communities, environmental organizations, and the agroecological-inspired farmers. Through these actors, the Simeto is reframed not as a resource to be exploited but as a living entity requiring protection, reciprocity, and long-term stewardship. These overlapping interests and visions produce conflicts, asymmetries, and stagnation that undermine shared and ecologically balanced governance.

Living along the river. Between collective struggles and ecological restoration

Agricultural Practices, Irrigation, and Collective Agency in the Simeto Valley

In the case of the Simeto Valley, grassroots organizations and movements gathered over the years around the Presidio⁵ play a crucial role as actors aspiring to change, not only in territorial governance but also in ecological and environmental matters. This aspiration is not limited to practical interventions but extends to a symbolic reconfiguration of the territory. Through discursive practices and situated narratives, members of the Participatory Presidium have shaped a more cohesive imaginary of the Valley, mobilizing shared representations to advance claims of ecological care, territorial belonging, and political visibility. The creation of new terms to describe local inhabitants reflects an effort to rearticulate subjectivities and unsettle dominant framings of rural peripherality. The chosen label *Simetini* reframes identity through the river, understood not only as a physical entity but also as a symbolic connector of people and territory.

⁵ Further information on the Presidio Partecipativo – including its origins, development, and role in participatory territorial governance – can be found on its official website <https://www.presidiосимето.ит/>, which provides comprehensive documentation on its structure, guiding principles, and ongoing activities.



This identity-label emerged in response to social fragmentation and pressing environmental threats, such as the proposed waste incinerator in the early 2000s. Yet the process carries contradictions: a unified identity may strategically counter fragmentation but risks oversimplifying complex local dynamics. In fact, *Simetini* identifies not with fixed territorial boundaries but with the river itself, understood as a common good and symbolic connector of people and places. It also draws from a shared history of mobilizations – from the anti-incinerator and anti-landfill struggles to community mapping and the signing of the River Agreement – which provided a collective narrative of belonging and care. At the same time, the label encompasses a heterogeneous social composition, including small farmers, herders, new inhabitants with agroecological orientations, activists, academics, and local administrators, who choose to recognize themselves in this name. Thus, *Simetini* is less a fixed essence than a relational construct, shaped through ongoing interactions and negotiations within the Presidio⁶. Naming thus becomes a means to challenge exclusion and reassert agency, though it may also obscure internal diversity and produce new divisions within a collective already facing historical and environmental inequalities⁷.

One key driver of biodiversity innovation is the Simeto Ecomuseum (Davis 1999, 2009; Pappalardo 2021; Reina 2014), a development project launched by the Presidio in 2019⁸. It engages with the territory, its more-than-

⁶ The Participatory Presidium acts as a key agent of change, mediating between grassroots actors – including farmers, new inhabitants, and local associations – and institutional structures. It fosters participatory governance, environmental stewardship, and knowledge co-production, while navigating structural inequalities, social fragmentation, and contested decision-making processes. Through initiatives such as community mapping, the River Agreement, and collaborations with the Ecomuseum and academic partners, the Presidium enables inclusive engagement and cultivates a relational understanding of the river as a common good, even as it balances its grassroots origins with institutional legitimacy.

⁷ In the context of the Simeto Valley, environmental inequalities manifest in unequal access to resources, water mainly, in the greater exposure of certain communities to environmental and health risks linked to landfills (see: Tiriti garbage disposal), agricultural pollution, and contested infrastructure projects, as well as in vulnerability to processes of desertification and rural abandonment. These conditions intersect with historical social and economic inequalities, producing a complex landscape of territorial marginalization.

⁸ In 2021, a formal request for regional recognition of the Simeto Ecomuseum was submitted under Sicilian Regional Law 14/2016. The application was the result of years of collective work by dozens of activists who gathered memories, oral histories, and cultural elements across the valley and its various “antennae” – the local nodes that together form the Ecomuseum. Conceived as a “pact of care” between communities and their territory, the initiative extends the trajectory of the Simeto River Agreement, aiming to safeguard the valley through proactive, participatory stewardship. Far from being limited to heritage preservation, the Ecomuseum is understood as a living, evolving process: it

human inhabitants, and long-term ecological and social transformations. Within the context of BIOTraCes, the Ecomuseum emerges as a dynamic platform for fostering engagement with the river and its ecosystem (De Varine 2005; Maggi, Murtas 2004). Co-research highlights the agency of actors often excluded from dominant narratives, such as small-scale farmers and pastoralists, historically on the margins. These actors have long faced limited opportunities for political participation, little voice in public and policy arenas, and economic disadvantages under prevailing market and water governance conditions. Historically, water management in the valley has generated both collective benefits and conflicts: while centralized consortiums often impose high tariffs, inefficient services, and clientelistic practices, neighbour-to-neighbour arrangements within smaller irrigation consortia enable collaboration, trust, and equitable resource sharing. Micro-level tensions sometimes emerge over conduits or water use, but these are counterbalanced by local cooperation and dialogue with the *guardiani dell'acqua* who maintain direct connections with farmers and ensure functioning irrigation networks.

By engaging these actors in collaborative research and participatory practices, the project not only documents their knowledge and practices but amplifies their perspectives, fostering recognition of their role in shaping ecological and social dynamics in the valley. Their relationship with the river involves not only adaptation but active transformation of the system. Beyond resisting large-scale projects like intensive agriculture or agrivoltaics, their practices – sustainable farming, agroecology, or pastoralism – embody long-standing connections with the river and enhance biodiversity. These are not mere responses to pressures, but ways of living shaped by ongoing interaction, seeking to reimagine the river's role in a changing landscape.

Rather than focusing solely on heritage, the Ecomuseum addresses current ecological challenges arising from evolving human non-human relations and environmental transformations. It seeks to reconnect inhabitants with the river – not as a resource to exploit but as a dynamic presence shaping both landscape and livelihoods (Lambert-Pennington, Pappalardo 2025). In doing so, it deepens understanding of the river's role in sustaining biodiversity and provides a framework for adaptive, locally grounded responses to ecological change.

interlaces cultural recognition, ecological regeneration, and civic engagement, offering a framework in which inhabitants, researchers, and institutions can collaboratively reimagine their relationship with the river and landscape. This makes it not only a tool of territorial valorisation but also a laboratory of socio-environmental innovation, sustaining biodiversity and reinforcing local agency in the face of structural challenges.



Over time, the Presidio has gained legitimacy, particularly in municipalities like Paternò, shifting from peripheral to central in decision-making. Yet greater influence brings risks, such as alienating its activist base. This evolution has triggered internal reflection on its changing role. The Presidio's shift from grassroots protest to a more institutionalized actor has altered its approach: now focused on securing funding, developing socially and environmentally oriented projects, and building collaborations with regional and national institutions, including the University of Catania. Despite this institutional turn, the Presidio remains a crucial arena for cross-sectoral collaboration, bringing together academic institutions, local authorities, grassroots associations, small-scale farmers, pastoralists, and others. This collaborative framework enables experimentation with alternative forms of engagement, including participatory action research⁹ adopted within BIOTraCes, co-design of territorial initiatives, and multi-level dialogue between historically marginalized actors and institutional bodies. Through these practices, the Presidio facilitates inclusive knowledge co-production, fosters stewardship of the river and its ecological systems, and strengthens socio-environmental networks, while continuing to navigate internal tensions and an evolving role within the Valley's complex landscape.

Re-inhabiting the valley through regenerative practices

In a territorial context deeply impacted by agroindustry, transformative change and ecological stewardship emerge through alternative agricultural practices and new ways of living within the ecological crisis. This is visible in a growing group of small-scale farmers/dwellers¹⁰ in the Simeto Valley

⁹ Within the Simeto Valley case study, participatory action-research (PAR) has played a crucial role in bridging grassroots mobilization and institutional engagement. Introduced through collaborations between the Presidio and academic groups, PAR has provided tools for community mapping, collaborative planning, and more recent multispecies and biodiversity-oriented inquiries. This methodology has allowed local actors not only to articulate shared concerns and visions but also to co-produce situated knowledge that aims to inform governance and development trajectories. At the same time, the integration of PAR into the Presidio's practices highlights an ongoing tension: while it strengthens legitimacy and capacity, it also risks distancing the group from its original grassroots orientation.

¹⁰ The term "farmers/dwellers" is used by the authors to emphasize the dimension of inhabiting the valley. Unlike previous production models – such as those based on monoculture – which often involved cultivating land without necessarily living in the same place and thus conceived of the territory primarily as a space for production, the farmers/dwellers described in the paragraph connect their choice to practice regenerative agriculture with a desire to re-inhabit the Simeto Valley.

who challenge conventional land use. Most cultivate plots of around two hectares, often without traditional farming backgrounds. Within an informal network of about 20 farmers along the middle Simeto, many are Sicilians who lived elsewhere for work or study, while others deliberately relocated from Italy or abroad, often leaving qualified careers in search of a different lifestyle. Unlike the older generation, many newcomers are highly educated and combine farming with other professions. Drawing on alternative and permaculture-inspired approaches, these farmers foster inclusion and biodiversity regeneration. Their practices¹¹ aim to repair the fractured relation between humans and other forms of life, disrupted by agroindustry and water engineering. Moving beyond citrus monoculture (Figure 6), they adopt largely organic methods, avoid pesticides, and actively regenerate soil and biodiversity, by applying sustainable water management and crop diversification. Unlike past generations, they acknowledge the ecological impoverishment caused by monoculture and no longer benefit from the economic returns that once sustained valley residents. Transformative change here refers less to technological innovation than to a reorientation toward an interconnected relationship with the land. This interconnection entails recognizing the co-dependence between humans and non-human beings, both plant and animal, thereby reversing the logic of an “extractive” relation. Whereas monocultural agriculture has been based on maximizing the extraction of soil nutrients to increase yields, emerging farmer/dweller practices emphasize “restitution,” devoting significant effort to the continuous reintegration of organic matter into the soil in challenging dominant monocultures – citrus, wheat, and other water-intensive crops – they confront an agricultural model that continues to endanger the river’s ecosystem amid erratic rainfall and prolonged droughts. Innovation lies not in specific techniques but in their application within a context historically shaped by extraction and resource rationalization. By progressively freeing land from pesticides and monoculture, these regenerative farmers disrupt the conventional agricultural landscape of the Simeto Valley.

¹¹ Permaculture-oriented farmers/dwellers of the Valley engage in practices like creating wet areas through the restoration of traditional irrigation systems such as the *saje* (Figure 5) and, when possible, opting for open canalisation of water. This technique releases water from concrete piping, allowing it to flow freely over the land, which considerably boosts local biodiversity. They also introduce a variety of vegetation species. In a context where commercially driven crops are mainstream, these farmers choose to plant “unproductive” species such as nitrogen-fixing plants but are nevertheless vital for biodiversity regenerative purposes.



Figure 5. Saja or water channel (Anonymous' picture)

Alongside ecological practices, they forge new forms of social connection. Insights from 'collaborative ethnography' (Herbert 2000; Lassiter 2005) conducted by BIOTraCes researchers highlight these dynamics. In a socially fragmented valley, where neighbourly ties are often weak, networks of young farmers create spaces for mutual learning, voluntary work, and friendship. These relations serve as immaterial infrastructures that enable individuals without family or institutional support to remain in the valley. They also have material effects, such as sharing costly farming machinery (Simone 2004). These younger inhabitants maintain a complex relation with conventional farmers, oscillating between attraction and rejection. They recognize their distance from traditional practices, framing their path as "trial and error" or, as one put it, "we learn as we go." This adaptive approach mixes experimentation with ongoing negotiation with local knowledge. While they seek contact with older traditions, tensions persist, as mutual understanding is difficult. The newcomers stress the limits of extractive and competitive mindsets, advocating more collaborative practices. Their choice to "dwell" (Magnaghi 2014) rather than merely "produce" (Lupo 1990) in the valley marks a rupture with intensive production models that marginalize them. They attempt to combine subsistence elements

with a vision reconnecting with land and non-human life (Kirksey, Helmreich 2020; González-Duarte, Méndez-Arreola 2024) making the valley feeling like “home” (Schuurman 2024). Yet, as a small and relatively isolated group, their efforts risk appearing idealistic or disconnected from entrenched realities. This underscores the tension between “innovation” and “tradition”, engagement and marginalization, within a landscape shaped by long-standing practices and external pressures.



Figure 6. Citrus monoculture (Picture by anonymous)

Activists and municipalities' alliance towards the mapping of energy infrastructures

The critical mapping of energy infrastructures is an important area of action for actors and groups engaged in the stewardship of the Simeto Valley, as it enables a better understanding of the socio-ecological implications of renewable energy transitions at the local scale, particularly in terms of land use change. By mapping energy infrastructures, these stewards can strengthen the involvement of local communities and institutions in the planning and zoning of large photovoltaic plants.

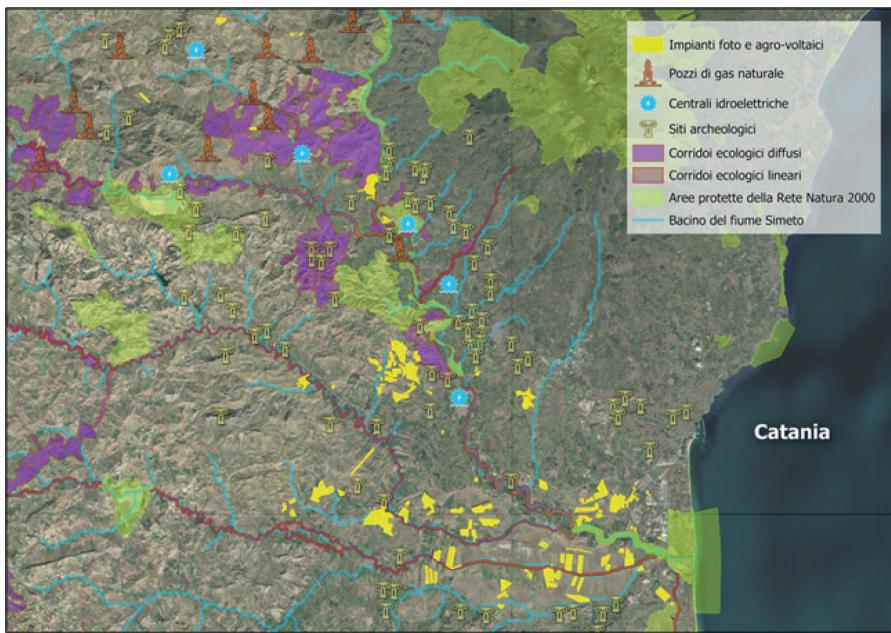


Figure 7. Energy infrastructure in the Simeto Valley: generation plants in the socioecological context (Map by anonymous)

In recent years, the Simeto Valley has become a hotspot for industrial-scale photovoltaic investments in Italy. The figures speak for themselves: with 51 projects fully permitted, between 2800 and 3500 hectares of farmland are going to be covered with photovoltaic panels and complementary infrastructures, for the next twenty to thirty years, at least. Additionally, 24 projects are expected to be permitted in the next few years, with a corresponding land demand. This process marks the beginning of a long-term, structural transformation, which is already reshaping how people inhabit and relate to the territory (Franquesa 2018).

Three grassroots organisations are playing a pivotal role in mapping energy infrastructures and photovoltaic plants in the Simeto Valley, positioning themselves as key actors in the ongoing conversation about “sustainable” territorial governance. The participation of the three organisations is enabled by the specific methodological approach of BIOTraCes, based on Participatory Action Research. In this context, the UNICT team, acting as the local node of BIOTraCes, can be considered as an innovator, operating towards the intertwined directions of community activation and research in the Simeto Valley.

The first of the three organisations is the Participatory Praesidium of the Sime-to River Pact, the BIOTraCes societal partner. The second is “Sciara Viva”, an umbrella organisation from Belpasso, one of the municipalities of the Simeto Valley. The third is “Lega Ambiente Ancipa” and is active in the municipality of Troina, in the Simeto high course.

This mapping is crucial for several reasons (Figure 7). First, it will provide academia with a comprehensive data set to investigate what the energy transition implies for the Valley and its territories. Second, it will serve as a tool for local institutions, guiding evidence-based territorial policies. Lastly, it will act as a platform for fostering community engagement, empowering local residents to have a say in the zoning and planning processes for new energy plants.

Grassroots organisations’ contribution has been key at various stages of the mapping process. They have acted as co-researchers during the development phase, providing valuable insights into the locations of photovoltaic plants, as well as the ecological and historical-cultural context in which these plants will be situated. Their access to informal, community-based knowledge has been crucial in translating these insights into georeferenced evidence, providing a deeper understanding of the land’s complex history and its current ecological dynamics.

They also have autonomously conducted multiple collective GIS¹² surveying sessions, with a particular focus on exploring the ecological and historic-cultural context of lands that are rapidly being acquired for new “green” energy infrastructure projects. Grassroots organisations will also be key players in the management and upscaling phase of the map. Once the map is published as an online geoportal, with the support of the BIOTraCes project, the three organisations will be part of the management board. Their role will be critical in overseeing the ongoing process of map updating, which will also involve crowd-sourced contributions from users.

Originally designed as a tool for local action and participatory research, the methodology behind the map could potentially be adapted to monitor and influence a more equitable and conscious implementation of energy transitions across the wider Sicily.

While these organisations could be pivotal in facilitating knowledge-sharing and expanding the network that supports the map, it is important to acknowledge that the broader success of such initiatives depends on navigating a complex landscape of institutional resistance, unequal access to resources,

¹² GIS stands for Global Information System



and shifting political priorities. Moreover, the sustainability of this initiative remains uncertain, particularly once the BIOTraCes project concludes. To mitigate this risk, efforts are underway to establish long-term governance structures and forge partnerships with institutions and other civil society networks, ensuring the continued updating and effective use of the map by local actors. This process also involves alternative energy stakeholders, such as emerging Renewable Energy Communities (CER), highlighting alternatives to a renewable energy transition solely pivoting on industrial-scale plants controlled by corporate actors.

Conclusion

This report offers an overview of the complex realities shaping the Simeto Valley, which has been deeply affected by ecological transformation, economic crisis, and the erosion of local control over what many consider a vital biocultural heritage. Drawing on initial findings from the BIOTraCes project, the report explores ongoing changes in the region, particularly regarding agriculture, water management, energy infrastructure, and the shifting dynamics of land and natural resource control. The analysis is ongoing, with continuous input from societal partners and local actors engaged in fieldwork. Central to this inquiry is the question of what “transformation” truly entails (and “how” and “for whom”), especially in response to the ecological crisis. These are crucial questions in the effort to resist ecological degradation, particularly at the local level (Tsing, Mathews, Bubandt 2019). A key aspect of this work is the active participation of local groups and municipalities in energy-related decisions, as well as the exploration of alternative water governance models and regenerative agricultural practices.

These practices go beyond challenging the dominant systems; they navigate the complex, often contested spaces where “tradition” and “innovation” intersect. In doing so, they offer alternative ways to cultivate and engage with landscapes that have long been shaped by agro-industrial exploitation. What sustains this ongoing process is not only a commitment to knowledge-sharing, but also a firm rejection of the extractive logics that have defined both local and global power structures. In this context, collaborative research serves as a platform for actively reimagining, allowing endangered, more-than human assemblages to assert their role and challenge the forces that seek to reduce both their present and their future to mere economic and industrial considerations.

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