Cultivating Resilience: Permaculture and Self-Sufficient Communities across European Contexts

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Independent living, defined as the ability to meet basic needs with autonomy and resilience, has gained popularity amid climate change, food insecurity, and energy dependence. Permaculture, a holistic design framework rooted in ecological ethics, offers practical strategies to enhance self-sufficiency while fostering community resilience. This research explores how permaculture has been developing across seven European countries (Italy, Germany, Croatia, Slovenia, Kosovo, the Czech Republic and Spain) through a comparative case study approach. Using qualitative data from literature reviews and project documentation, the research identifies key practices in food production, water and energy management, community governance, funding, theoretical framework and ecological education.

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RAZVIJANJE ODPORNOSTI: PERMAKULTURA IN SAMOOSKRBNE SKUPNOSTI V EVROPSKIH KONTEKSTIH

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Ključne besede:
neodvisno življenje, odpornost skupnosti, samooskrba, Evropa, trajnostni prehodi, prehranska varnost, energetska varnost

Neodvisno življenje, opredeljeno kot zmožnost zadovoljevanja osnovnih potreb z avtonomijo in odpornostjo, pridobiva na priljubljenosti v času podnebnih sprememb, prehranske negotovosti in energetske odvisnosti. Permakultura kot celostni pristop, utemeljen na ekološki etiki, ponuja praktične pristope za krepitev samooskrbe in hkratno spodbujanje odpornosti skupnosti. Raziskava preučuje razvoj permakulture v sedmih evropskih državah (Italija, Nemčija, Hrvaška, Slovenija, Kosovo, Češka in Španija) s primerjalnim pristopom študij primerov. Na podlagi kvalitativnih podatkov iz pregleda literature in projektne dokumentacije raziskava opredeli ključne prakse na področjih pridelave hrane, upravljanja z vodo in energijo, skupnostnega upravljanja, financiranja, teoretičnih izhodišč ter ekološkega izobraževanja.

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1 Introduction

Independent living is the capacity of individuals, households, or communities to manage their lives, meet basic needs, and make choices without overreliance on external systems, combining self-sufficiency, the ability to provide essentials such as food, water, shelter, and energy, and autonomy, the freedom to make decisions and assume responsibility for one's well-being (DeJong, 1979). It implies not isolation but dignity, agency, and participation in social life while reducing dependence on unstable systems (World Health Organization, 2015).

Its global relevance has grown in recent decades due to interconnected crises such as climate change, food insecurity, and energy dependence. Decentralised living systems reduce ecological footprints and enhance resilience to environmental change (IPCC, 2022). Increasing volatility in global food systems, driven by climate change, biodiversity loss, and market disruptions, has made local food production critical (FAO, 2021). Household and community gardening, agroecology, and permaculture improve food availability and accessibility, reducing vulnerability to external supply chain disruptions (Altieri & Nicholls, 2020). Simultaneously, decentralised renewable energy decreases reliance on non-renewable resources and supports a just energy transition (IEA, 2021).

Permaculture constitutes a key dimension of independent living, as it enhances self-sufficiency, food and energy security, waste reduction, and community resilience while reducing dependence on unstable external systems and fostering long-term sustainability.

2 Theoretical framework

Permaculture, developed in the 1970s by Bill Mollison and David Holmgren, represents a holistic design philosophy that integrates ecological principles with ethical imperatives–Earth Care, People Care, and Fair Share (Holmgren, 2002). Its applications span agriculture, water management, renewable energy, community governance, and education (Ferguson & Lovell, 2014). Permaculture constitutes a key dimension of independent living, as it enhances self-sufficiency, food and energy security, waste reduction, and community resilience while reducing dependence on unstable external systems and fostering long-term sustainability.

It is defined as a holistic design system that draws on ecological patterns and processes in nature. Permaculture is applied to develop sustainable food systems, housing, and community structures (Mollison, 1988). Its principles enable individuals and communities to enhance their self-sufficiency, thereby reducing dependence on external supply systems.

3 Methodology

The study applied a comparative case study design (Eisenhardt & Graebner, 2007) to explore how permaculture is practised in diverse European contexts. The research was conducted during a week-long workshop at the University of Maribor (August 2025), where participants from six countries collaborated with a permaculture mentor in Slovenia to document and analyse these initiatives. Each participant contributed one or more case studies from their home country.

Table 1: Permaculture framework key factors summary

Resource and Infrastructure Management	Soil Management
	Water Management
	Energy Resource
	Food System
	Waste Management
	Ecobuilding
Community and Engagement	Educational projects
	Regional/Local actors involvement
	Collective workshops
	Traditional local practices
	Volunteering
Socioeconomic Context	Economic activities
	Financial funding
	Land ownership
	Governance structure
Theoretical Sustainability Integration	Permaculture claim
	Sustainable framework/ perspective
	Ethical view/ principles
	Cultural factors influence
Scale	Inhabitants (number & characterisation)
	Area (ha)
	Animals involved

Source: own elaboration based on permaculture framework (Holmgren, 2002; Ferguson & Lovell, 2014).

Data obtained by literature review and different project documentation were analysed through thematic coding. The initial key factors (Table 1) analysis was based on the permaculture theoretical framework. Comparative synthesis identified similarities and differences. This iterative process was enriched by group discussions, enabling collective negotiation of meaning and validation of interpretations.

4 Case analysis

4.1 Slovenia

The permaculture movement in Slovenia has been actively developing since the 1990s, with a strong focus on practical implementation and community building. This local adaptation of permaculture principles is rooted in a rich tradition of self-sufficiency and a deep connection to nature. The Permaculture Society of Slovenia (Društvo za permakulturo Slovenije), established in 1996, has played a pivotal role in promoting permaculture through educational programs, workshops, and community events (Društvo za permakulturo Slovenije, 2024).

The Slovenian approach often emphasises regenerative agriculture, especially through the creation of forest gardens (*gozdni vrtovi*) and the use of natural building techniques. One example of a successful project is the PermaMama estate in Rimske Toplice, which serves as a model for self-sufficiency and educational workshops, showcasing how permaculture principles can be applied to create a sustainable and productive living environment (PermaMama, 2024). Furthermore, organisations like the Permaculture Institute Maribor are leading projects focused on regenerating the local environment and promoting a higher quality of food (Permakulturni Inštitut Maribor, 2024). Another example of a key initiative is the International Centre for Self-Sufficiency Dole, which includes the Education Polygon Dole. This site serves as a learning hub for all generations, demonstrating how to apply permaculture principles to rebuild degraded soil, manage water, and promote a holistic approach to sustainable living (IPVO, 2024; Vovk Korže, 2024). These initiatives demonstrate how permaculture is being adapted to Slovenia's specific environmental and social context, reinforcing the core ethics through tangible, local actions.

4.2 Spain

The permaculture movement in Spain has been developing since the early 1990s, primarily focusing on the Mediterranean region and prevailing traditional practices in the area. Water retention and hydrological design have been identified as central components of these adaptations, particularly through small-scale reservoirs and swales that enhance soil moisture, prevent erosion, and support biodiversity, as demonstrated in Southern Spain (Fiebrig & Van De Wiel, 2021). Food sovereignty and localised production are equally emphasised, aligning ecological restoration with social resilience and self-sufficiency (Naylor, 2019).

Three different cases illustrate this focus on water management, the food system, and community. Huerta del Boticario (0.13 ha, founded 2011) combines synergistic beds, mulching, companion planting, and a food forest, updating traditional gardening in a rebuilt, typical housing of humble village farmers (Huerta del Boticario, s.f.). Granja de Masphaël (5 ha, founded in 2013) utilises food as a pedagogical tool, enabling children to harvest produce, prepare meals, and learn about ecological diets, while also interacting with animals such as hens, donkeys, and bees for experiential learning (Granja de Masphaël, s.f.). Mas Les Vinyes (25 ha, founded in 2013), a cooperative, offers training, consultancy, certified courses, internships, and volunteer placements, reflecting permaculture's ethic of a fair share while linking professional development with community engagement (Mas Les Vinyes, n.d..).

4.3 Italy

Permaculture in Italy has been developing steadily since the early 1990s, beginning with pioneering courses and grassroots initiatives, such as Torri Superiore in Liguria, where a cultural association restored a 13th-century village, starting in 1989, renovating over 150 rooms with ecological materials and hosting Italy's first permaculture design courses (Torri-Superiore.org, n.d.). Formal networks emerged in the 2000s, including the Accademia Italiana di Permacultura (with support from Langford & Wade), the Istituto Italiano di Permacultura (Zucchetti), and the World Permaculture Association (Tallarico), linking educators, professionals, and enthusiasts nationwide. Hundreds of local groups implement projects in gardens,

farms, and communities, while networks such as Fruttorti and Coltivare Condividendo promote urban orchards, seed-saving, and biodiversity.

Case studies illustrate diverse applications. La Scoscesa integrates terraced gardens, swales, and micro-reservoirs, growing 148 plant varieties and supplying local families and restaurants (Dissapore, 2021; ReSoil Foundation, n.d.). Torri Superiore (Imperia, Liguria) combines eco-restored housing, communal gardens, and training programs, supporting cooperative living and ecotourism (Ecovillaggi.it, n.d.; Torri-Superiore.org, n.d.). Fattoria dell'Autosufficienza integrates pastures, orchards, renewable energy, and ecotourism while serving as a living classroom (Autosufficienza.it, n.d.; Romagna Toscana Turismo, n.d.). Casa di Paglia Felcerossa is a small off-grid homestead with straw-bale construction, polyculture gardens, and educational stays (ItaliaCheCambia.org, 2020; Casadipagliafelcerossa.it, n.d.).

4.4 Kosovo

In Kosovo, permaculture emerged in the 2010s, building on traditional self-sufficiency and ecological knowledge (Caka, 2020; Kjeldsen, 2021). The 314 Garden (2015) in Prishtina serves as a community farm and Edible Outdoor Classroom, featuring raised beds, a greenhouse, drip irrigation, and ninety trees, partially supplying SOS Children's Village while offering experiential learning for youth. Volunteers collaboratively maintain the site, promoting urban sustainability and environmental literacy (GAIA Kosovo & 3PEAS, 2021).

The Bozevce Permaculture Centre in Ranilug, founded by GAIA Kosovo, functions as a rural hub for ecological living and intercultural education (GAIA Kosovo & 3PEAS, 2021; GAIA Kosovo, 2024). It features gardens, orchards, greenhouses, beehives, rainwater harvesting, compost toilets, and passive solar buildings. Residents and volunteers engage in shared labour, participatory decision-making, and educational programs, fostering both social and ecological resilience. Bozevce exemplifies small-scale regenerative permaculture, integrating food sovereignty, renewable technologies, and community cohesion.

4.5 Germany

Permaculture in Germany originated in the 1980s and gained momentum with rising environmental awareness around the turn of the century. The German Institut für Permakultur e.V. was founded in 2003, followed by other grassroots initiatives, with the Permakultur Akademie now forming a national community of practice (Ulbrich & Pahl-Wostl, 2019, pp. 1–2). Permaculture is applied in diverse contexts, from urban gardens, such as those in Berlin, to large rural plots and sustainable green villages, linking human activity to an improved quality of life (Ulbrich & Pahl-Wostl, 2019, p. 9).

The Ecovillage Sieben Linden, home to around 120 adult residents, exemplifies community-scale permaculture, producing 75% of its food on-site. They utilise renewable energy, well-insulated housing made of wood, straw and clay, and water-saving techniques like compost toilets. Through this, they reduce their CO2 footprint to 2.4 t per person, while the average German contributes 8.9 t (Ökodorf Siebenlinden 2023, 5:49min). Workshops share sustainable living practices with visitors. Smaller initiatives, such as Waldgeister e.V. and the Boljahn family garden, demonstrate adaptive strategies that include sun traps, winter water capture, bokashi composting, raised beds, and integration of chickens and bees.

4.6 Croatia

In Croatia, organised permaculture began in 1995 with the founding of Hrvatska permakultura, promoting professional development, networking, and permaculture education across Croatia, Southeastern Europe, and the EU (Kiš & Kiš, 2014). The association emphasises "care for the Earth, care for people, and wise control over population and consumption" (Kiš & Kiš, 2014, p. 13) and has functioned since 2013 as an adult education platform for urban and rural community development. Permakultura Dalmacija similarly promotes sustainable living and regenerative design through education, collaboration, and awareness-raising (Permakultura Dalmacija, n.d.).

Two illustrative properties highlight Croatian permaculture in practice. Recycled Property Vukomerić, near Zagreb, was transformed by Matko Šišak in 2001 into an ecological education centre using recycled and natural materials, including straw,

wood, clay, and repurposed car tyres. Solar collectors, windmills, green roofs, and Finnish stoves provide energy and heating. The site hosts permaculture gardens, seed conservation, workshops, and operates as a living community with consensus-based governance (ZMAG, n.d.; Agroklub.hr; Drumtidam.info; Peroforum.hr).

Gea Viva, an eco-island retreat on Brač established by Sabine Engelhardt in 2010, combines off-grid living with fruit and olive cultivation, solar energy, rainwater collection, and composting toilets. It functions as an educational and meditative site, offering glamping, workshops, and volunteer engagement, emphasizing a holistic connection to nature (Agroklub.com., n.d.).

4.7 Czech Republic

Permaculture in the Czech Republic blends traditional self-sufficiency with ecological design, rooted in widespread gardening tradition and post-1989 environmental activism (Kolářová, 2020). In the Czech context, permaculture has developed significantly from this strong gardening tradition, evolving into a recognised and growing movement for sustainability and resilience. The national association Permakultura CS, founded in the early 1990s, supports networks of gardens, farms, and Regional Permaculture Centres (REPECs), publishes the *Key to Self-Sufficiency,* and maintains international connections (Permakultura CS, 2024a, 2024b). Mendel University in Brno provides research, teaching, and practical training (ICV MENDELU, 2024).

Initiatives include demonstration projects, selective applications in schools, households, and REPECs, with sites like Hostětín Ecocentre showcasing renewable energy, orchards, food forests, and ecological construction as part of a model village. Beyond rural contexts, urban gardens in Prague and Brno integrate food production with social inclusion, while schools experiment with food forests and composting, embedding permaculture practices in everyday learning (Permakultura CS, 2024a). Governance is participatory, often led by families or associations, with international volunteers supporting Fair Share principles (Holmgren, 2002).

Despite challenges, limited policy support, funding, scalability, and generational continuity, Czech permaculture demonstrates how ordinary traditions can evolve into a broader sustainability movement. It promotes independent living, community

resilience, and sustainability transitions in Central Europe, while also becoming increasingly visible and popular among diverse social groups.

5 Comparative analysis of European permaculture movements

European permaculture movements share a core ethos of sustainability, ecological stewardship, food sovereignty, and community resilience, yet they differ in scale, institutionalisation, and local adaptation. In all the cases, education is central and community engagement and participatory governance are common, as exemplified by cooperatives in Spain (Mas Les Vinyes) and Germany (Sieben Linden), as well as volunteer networks in Kosovo and Croatia (Table 2).

Differences emerge in ecological focus and technological adaptation. Mediterranean countries, such as Spain, Italy, and parts of Croatia, prioritise water retention, swales, and drought-tolerant polycultures, whereas Slovenia emphasises forest gardens and soil regeneration. Germany demonstrates energy-conscious design and renewable integration at the household and ecovillage scale, while Kosovo and the Croatian mainland rely on small-scale, off-grid innovations. Scale also varies: Italy and Germany host large ecovillages and multifunctional farms, while Slovenia, Kosovo, and the Czech Republic often operate demonstration gardens or educational hubs.

Institutionalisation differs regionally as well, with formal networks prevalent in Italy, Germany, and the Czech Republic, whereas Kosovo and Croatia rely on nascent associations and grassroots initiatives. Cultural traditions further shape practice: the Czech Republic and Slovenia integrate historical self-sufficiency and gardening heritage, while Mediterranean sites incorporate regional agricultural customs.

Despite these differences, all movements link permaculture principles to ecological restoration, community learning, and resilience-building. Their comparative analysis illustrates the flexibility of permaculture, which is adaptable to environmental constraints, societal norms, and scales, yet consistently oriented toward sustainable living, resource stewardship, and knowledge sharing.

Table 2: Comparative table of permaculture practices in European countries

Country	Main Focus	Key Initiatives	Scale	Distinctive Features
Slovenia	Forest gardens, regenerative agriculture, natural building	PermaMama, Permaculture Institute Maribor, Education Polygon Dole	Educational hubs and estates (small to medium scale)	Long tradition of self-sufficiency, focus on education
Spain	Water retention, food sovereignty, community engagement	Huerta del Boticario, Granja de Masphaël, Mas Les Vinyes	Small farms), cooperative models	Integration of traditional Mediterranean practices
Italy	Restoration of villages, eco-building, multifunctional farms	Torri Superiore, La Scoscesa, Fattoria dell'Autosufficienza, Casa di Paglia Felcerossa	Large ecovillages, multifunctional farms	Historic restoration with permaculture, strong national networks
Kosovo	Community gardens, eco-education centres, off-grid living	314 Garden Prishtina, Bozevce Permaculture Centre	Small-scale community projects	Youth education, intercultural learning
Germany	Ecovillages, renewable energy, urban/rural gardens	Ecovillage Sieben Linden, Waldgeister e.V., Boljahn family garden	Large ecovillage (120 residents), small family gardens	Low CO2 footprint, national academy and networks
Croatia	Ecological education centres, off-grid eco-retreats, community projects	Recycled Property Vukomerić, Gea Viva, Permakultura Dalmacija	Education centres, eco-retreats, grassroots initiatives	Grassroots activism, adult education platforms
Czech Republic	Gardening traditions, ecological villages, renewable energy	Permakultura CS, Hostětín Ecocentre, urban gardens in Prague & Brno	Community-based projects, family/association-led initiatives	Strong gardening heritage, participatory governance

6 Conclusion

Permaculture movements across Europe, while operating in diverse national and cultural contexts, demonstrate the versatility and vitality of the permaculture ethic. Despite these differences, all movements link permaculture principles to ecological restoration, community learning, and resilience-building. Their comparative analysis

illustrates the flexibility of permaculture, which is adaptable to environmental constraints, societal norms, and scales, yet consistently oriented toward sustainable living, resource stewardship, and knowledge sharing.

Every example, from micro-homesteads to large ecovillages, confirms that permaculture is not just a theoretical concept but a set of rigorous agronomic practices and social innovations. By combining knowledge and practice, permaculture projects position themselves as living laboratories, developing resilient and self-sufficient models that can offer independent living as an alternative to conventional living.

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