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Social justice for traditional knowledge holders will help conserve Europe's nature

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Abstract

Biodiversity of European cultural landscapes is threatened by land abandonment and intensification. While the conservation benefits of traditional management practices have been long acknowledged, recognition of traditional knowledge started only recently in Europe. Respect for the holders of traditional knowledge (TK holders) themselves lags even more behind, often leading to social injustices. Social injustices towards TK holders span from disrespect and misrepresentation, invisibility, misunderstanding, economic and political vulnerability, unethical collaborations, rights violations, disconnection, uncontextualized education to lack of inclusivity – leading to neglect of TK holders in conservation science, policy and practice. Resolving these social injustices would benefit both people and nature. Benefits of resolving injustices include better cooperations in conservation management, mutual understanding, improved representation and participation, increased respect, economic and legal security, strengthened land stewardship, better tradition-based conservation innovations, and more appropriate management regulations. Best practices are presented to inspire ways to foster recognition for TK holders and their knowledge, worldviews and values, promote the inclusion of alternative voices in the media and school curricula, encourage meaningful participatory decision making, mobilise strategies to re-design and decolonize financial support mechanisms, decrease bureaucratic loads, and promote TK holder-led conservation activities. Supporting TK holders and keeping

traditional land management practices alive should be considered as a social justice imperative of great strategic importance for long-term social-ecological resilience in Europe.

Keywords: cultural landscapes, farmers, nature conservation, recognition, traditional land management, Common Agricultural Policy (CAP)

Highlights

- European cultural landscapes are threatened by the erosion of traditional knowledge
- Traditional knowledge holders face social injustices harmful also for conservation
- Social injustices include disrespect, misrepresentation, and perverse regulations
- Meaningful collaborations, heard voices and fair partnerships can resolve injustice
- Resolving social injustices would benefit both people and nature in Europe

1. Introduction: People 'behind' traditional land-use practices beneficial for conservation

Traditional land management systems have long been acknowledged for their diverse benefits to conserve and enhance biodiversity in Europe (Halada et al. 2011). These systems are characterized by a low chemical and machinery input but high levels of human attention and stewardship, and they often contribute to the development and maintenance of species-rich cultural landscapes with mosaics of ecosystems characterized by high conservation-value (Agnoletti and Rotherham 2015). Natural values usually decline when traditional management is abandoned (O'Rourke et al. 2016; Herzon et al. 2022). As a result, area-based conservation practices often try to mimic traditional land management practices (Tardella et al. 2020).

The recognition of traditional knowledge, on which these traditional management practices are based started, however, only relatively recently in Europe (Molnár et al. 2008; Fernández-Giménez and Fillat Estaque 2012, Hernández-Morcillo et al. 2014). European traditional knowledge has been documented by ethnographers since the 19th century, for example, with regard to the uses of wild plants (Svanberg and Łuczaj 2014), but has been used only marginally and often unconsciously in nature conservation.

Traditional knowledge in Europe can be defined as “a cumulative body of knowledge, practice, and worldview, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes 2017), usually based upon personal experience with the surrounding landscape, acquired through the direct extensive management of the landscape, but also containing centuries-old, communally stored experiences (Molnár et al. 2008; Hernández-Morcillo et al. 2014; Plieninger et al. 2022). Traditional knowledge is in some domains unexpectedly unaffected by Western science in Europe (e.g. knowledge of the ecological impacts of traditional management, Babai et al. 2015, or knowledge of the spawning locations of fish, often ignored in science-based assessments, Mustonen and Huusari 2020),

although reciprocal knowledge exchange has a long history in some domains (e.g. ethnobotany, medicinal and wild food plants, Svanberg and Łuczaj 2014; Teixidor-Toneu et al. 2022).

Recognition of traditional knowledge holders (TK holders) themselves is an even more recent phenomenon in Europe (Kis et al. 2017; Molnár et al. 2020; Plieninger et al. 2022). TK holders are small-scale, traditional farmers and herders, but also many forest users, hunters, fishers, foragers and other inhabitants that know, manage and steward their surrounding environment based predominantly on traditional knowledge and practices. Recognition is emerging in Europe partly because of the sharp decline of traditional management systems and the resulting failures in nature conservation (Sutcliffe et al. 2015), the growing recognition of traditionally produced high-quality organic and craft-food, and as a response to increasing global recognition of the contributions of Indigenous Peoples and local communities to nature conservation (Roué and Molnár 2017; IPBES 2018; Forest Peoples Programme et al. 2020; Hill et al. 2020). However, ageing of TK holders is a critical concern in most cultural landscapes across Europe. Younger generations tend to abandon traditional practices when their future economic prospects are uncertain (Oteros-Rozas et al. 2013b; Hartel et al. 2023). With the passing of the older generations of TK holders and the increasing disconnection of the youth from the local cultural landscape, and the disintegration of the formal and informal institutions governing local traditional practices (Babai et al. 2021), traditional knowledge is more likely to erode (Varga and Molnár 2014; Hernández-Morcillo et al. 2014; Fernández-Llamazares et al. 2021). This will contribute to further change and abandonment of traditional practices, which will negatively impinge on nature conservation (Oteros-Rozas et al. 2013b; Kun et al. 2019).

Here we present a perspective piece from one of the first continental-wide symposia on traditional knowledge for nature conservation across Europe held at the XX Conference (XX, 2022). We attracted scientists with deep linkages in traditional management systems across Europe, and we shared perspectives and emergent categories for analysis. We found that social injustices towards TK holders are pervasive in Europe. In the next section of the paper, we describe the current conservation system in Europe, with a focus on the environmental legislation of the European Union (EU), and its negative outcomes for traditional land-use practices and TK holders. We then focus on the social injustices imposed on TK holders, using the Martin et al. (2016) categories of recognition injustice as an analytical framework. Their framework aligns well with the emergent categories developed by our team and provides a theoretically sound basis for the presentation of this perspective. We illustrate the categories of social injustice with a range of examples. We identify best practices to enhance recognition of TK holders in conservation. We conclude with a discussion of the positive conservation contributions of continuing application and adaptation of traditional knowledge by TK holders.

In this paper, we justify the need for respecting the rights of TK holders by the European conservation community and argue for supporting their critical role in safeguarding biodiversity. We, however,

acknowledge that not all the practices of TK holders are always beneficial for conservation. Although the environmental impacts of traditional practices are not directly comparable to the devastating effects of large-scale industrial development, agricultural expansion and resource extraction in Europe (IPBES 2018), there are nevertheless instances of traditional practices that can lead to biodiversity loss (e.g., in relation to human-carnivore conflicts; Marino et al. 2015, 2022). We argue that the social injustices faced by TK holders can exacerbate such conflicts and undermine current contributions of traditional practices to the maintenance of cultural landscapes in Europe. As such, we posit that better engaging TK holders in conservation science, policy and practice, is essential to improve conservation and resource management policies and contribute to resolve existing conflicts.

2. The conservation and agricultural regulatory environment of the European Union from a traditional knowledge holder's perspective

The EU has an extensive, top-down, science-informed regulatory and subsidy system for biodiversity-friendly management of landscapes and waters, largely referred to as the EU's Biodiversity Strategy. Such ambitious and long-term plan to protect nature and reverse the degradation of ecosystems is articulated through well-established directives (e.g., Habitats, Birds) and programs, such as the agri-environmental-climate schemes (AECSs), which influence the management plans for Natura 2000 areas, national parks and other high nature-value areas (Batáry et al. 2015). The conservation importance of traditional, long-term and low-input management practices is often emphasized in these regulations, especially in the case of semi-natural grasslands, which are usually recognized as hotspots of biodiversity in many European countries (Kun et al. 2019; Herzon et al. 2022).

The failure to halt biodiversity loss in Europe has made scientists and decision makers realize that engaging farmers and other local land users in conservation is essential for reasons of social justice and more inclusive governance, as well as for biodiversity protection (de Snoo et al. 2013; Šūmane et al. 2018). Research has identified how nature conservation benefits from acceptance, motivational and financial support and valuing of nature-friendly practices (Kovács et al. 2021; Strzelecka et al. 2021). In decision making, there is a strong increase in deliberative approaches, recognition of multiple values of nature, and involvement of local stake-, rights- and knowledge-holders (Palomo et al. 2011; Kelemen et al. 2013; Kovács et al. 2017; Marino et al. 2021). However, most of these studies have focused on conventional, intensive farmers working in Western Europe (particularly in old member states, Gorton et al. 2009), while ignoring the values, worldviews, objectives and practices of traditional farmers and other land users, including those in new member states from the Baltic to the Balkans and Carpathians (Tryjanowski et al. 2011; Strzelecka et al. 2021; Babai et al. 2021). It is important to note that EU policies have been found to be poorly aligned with local conditions in such countries (e.g., Gorton et al. 2009; Mikulcak et al. 2013).

Meanwhile, the EU provides substantial support for cultural revitalization, including traditional foods, medicines and handicrafts, and traditional agricultural revival programs and other traditions and folklore. Yet, the appropriate recognition of, and support for TK holders themselves is still largely absent (Hartel et al. 2023). Consequently, the agricultural, fishing and hunting regulations are often not only unsupportive, but also detrimental to local TK holders and can even be harmful to those very practices that are meant to be supported through such legislation (Manzano-Baena and Casas 2010; Babai et al. 2021; Kuokkanen 2020).

Frustrations of both conventional/modern and traditional farmers caused by culturally and economically inappropriate regulations are increasingly acknowledged in both scholarly and policy circles (cf. Kovács et al. 2021; Babai et al. 2021; Strzelecka et al. 2021). The top-down implementation of agricultural production, forestry and conservation agendas has led to the disenfranchisement of TK holders, often involving criminalization, marginalization, restrictions on livelihood activities and access to culturally valued resources (e.g., Babai et al. 2015; Kuokkanen 2020), especially when regulations go against the social norms of what is often understood as a 'good farmer' (Kovács et al. 2021). A typical example of value mismatch often heard among farmers in various situations in Europe is the question: "Why is a butterfly (or a bird) worth more than a sheep (or a farmer)?" – meaning that locals have to follow regulations that may be beneficial for some protected species (poorly known or even unknown by farmers) but are often harmful for their livelihoods and cultural identities (see also Marino et al. 2022).

The EU regulatory and subsidy systems were developed before the accession of the new Eastern/East-Central European member states (mostly steered by countries such as the UK, Netherlands and Germany; Gorton et al. 2009). The subsequent flow of concepts, experience and concrete, often rigid regulations, was unidirectional (West-East and also top-down), which, together with the unpreparedness of national and local authorities to adapt these culturally, economically and ecologically, led to widespread social injustices and unsuccessful conservation measures (Gorton et al. 2009; Babai et al. 2015; Kovács et al. 2017; Tryjanowski et al. 2011; Strzelecka et al. 2021).

3. Social injustices experienced by TK holders in Europe

Concerns about social justice have become prominent in recent debates about conservation (Martin et al. 2016). Resolving injustices is not only an ethical issue, but also essential for better conservation because it helps avoid and resolve conflicts and encourages participatory approaches (Berkes 2021). Martin et al. (2016) emphasize three aspects of environmental social justice: distribution, procedure and recognition. Distribution considers allocation of rights to benefits on one hand and costs and responsibilities on the other. Procedure defines the way decisions are made and by whom. Recognition is about the extent to which different agents, ideas, knowledges and cultures are respected, affirmed and valued. Conservationists have largely focused on distributional and procedural aspects, ignoring the recognition







aspect (Martin et al. 2016; Kovács et al. 2021). Our Symposium highlighted how failures of recognition underpin the social injustices suffered by TK holders.





Martin et al. (2016) identify four categories, each based on a different theoretical perspective, of explanations for recognition injustices: (1) cultural relations of power (Hegelian theory); (2) status inequalities resulting from cultural and economic forces (critical theory); (3) colonisation by Eurocentric, modernist knowledge production (decolonial theory); and (4) value universalism, lack of participation (capabilities theory). We found that these categories (Table 1, column 2) align well with a set of emergent categories developed from our collective experiences (Table 1, column 3), providing a sound theoretical basis for our perspective, illustrated with case examples (Table 1, column 4). All four explanations are relevant. For example, cultural relations of power with science and industrial production underpins lack of recognition of TK holders and their knowledge systems (Tengö et al. 2017), disrespect towards TK holders in public mindscapes, and under- and mis-representation in media (Table 1, row 1, Fig. 1). Progress narratives spread to support mechanisation and nationalisation of landscapes and mind-scapes in the early 20th century were specifically pitched in opposition to traditional knowledge and practice, which were portrayed as backward and undesired (Bonneuil 2004; Lien 2020), resulting in status inequalities. Status inequalities are also evident when traditional land uses are forced into market competition with industrially produced food, often supported with perverse regulations and subsidies (Table 1, row 2, Fig. 1). Colonization by Eurocentric, modernist knowledge production and land use is evident in the criminalization of some traditional practices, the expulsion of TK holders from territories used for generations, collectivization of agriculture during communism (Babai et al. 2015; Lien 2020) and recently land grabbing by large-scale agricultural corporations and invasions for territorial acquisitions (Table 1, row 3, Fig. 1). Value universalism and lack of participation underpins the ongoing marginalization of TK holders from many programs and funding initiatives of central governments, vilification of traditional practices in ways unfounded or grounded on research that does not take the social context into account, and lack of proper mechanisms to ensure the full and effective participation of TK holders in conservation policy and practice (Table 1, row 4, Fig. 1).

Table 1. Social injustices inflicted on TK holders in Europe

Nr	Categories of recognition injustice (Martin et al. 2016)	Social injustices towards TK holders	Illustrative case examples (CE 1-10, Figure 1)
1	Cultural relations of power (Hegelianism)	Disrespect and misrepresentation. Traditional knowledge and its holders, traditional practices and values are often regarded as backward and outdated in public mindscape in Europe, and colonial mentality (incl. dominance of top-down actions) still often prevails among decision makers.	The Sámi Indigenous Peoples are not allowed to use their traditional calendars, which conflict with the national hunting regulations. [CE 1]
		Invisibility. Voices of TK holders are rarely heard in the society. Public discourses and media usually lack topics crucially relevant for TK holders. There are even ethically unfair articles in media (cf. backwardness, vilification of traditional practices).	TK-based organic farmers and the new peasantry are ignored in EU regulations. [CE 2]
		Misunderstanding. The impacts of traditional practice on biodiversity and ecosystems are misunderstood, and misunderstanding leads to unfair and biased portrayals, interaction with TK holders and inclusion in policy.	Norwegian foragers are now listed as a threatening factor. [CE 3]
2	Status inequalities caused by cultural and economic forces (critical theory)	Economic vulnerability. Unjust competition from industrial, mass-produced food increases vulnerability to markets.	Traditional fishers in Malta face unjust competition from industrial fishers. [CE 4]
		Political vulnerability. TK holders have to (are forced to) tolerate culturally inappropriate (even perverse) regulations and incorrect policies to get the otherwise deserved financial support and subsidies which are provided by the state to promote or maintain sustainable management practices and decrease vulnerability of local livelihoods.	Spanish transhumant herders face restrictive regulations that limit substantially their mobility. [CE 5]
3	Colonisation by Eurocentric, modernist knowledge production (decolonial theory)	Unethical collaborations. Traditional knowledge of nature (long-term and recent changes and drivers) is often not respected, used without Free, Prior and Informed Consent (FPIC) or not used when it would be appropriate, or TK is unethically validated by science.	Romanian small-scale farmers (Carpathians) safe-guarding of endangered breeds is not respected. [CE 6]
		Rights violations. Long-term land and water use rights of TK holders is usually not respected because of nationalization of land in many countries around the mid-20th century, gazetted protected areas on TK holders' lands and waters, criminalization of some traditional	<i>Svinjars</i> (Serbia): Free-range pig keepers have been expelled from their traditional forests,

Nr	Categories of recognition injustice (Martin et al. 2016)	Social injustices towards TK holders	Illustrative case examples (CE 1-10, Figure 1)
		practices (e.g. small-scale hunting and fishing), and privatization and abolishing commons and customary laws.	lost their rights to use their former pastures. [CE 7]
4	Value universalism, lack of participation (capability theory)	Disconnection. TK holder communities often lack the capacity (and time) to get involved in collaborative actions, they often lack the specific NGOs and networks of likeminded people, while the ways of collaboration with partners may be culturally inappropriate.	Traditional pastoralists (Sardinia): lack of capability (compared to environmental organisations) for involvement in land use policy and planning, led to a National Park declaration on their traditional territory, despite their objections. [CE 8]
		Decontextualized education. Intergenerational knowledge transmission weakens rapidly, because of accelerated lifestyle changes and the education system that is based on Western science and decontextualized understanding of our world.	Expulsion of <i>svinjars</i> (Serbia) from their forests has significantly disrupted intergenerational knowledge transmission. [CE 7]
		Lack of inclusivity. Insufficient involvement of TK holders in protected area management, and little respect for Free, Prior and Informed Consent (FPIC) easily lead to conflicts and frustrations.	Hungarian herders (Hortobágy) have no formal participation in protected area management planning. [CE 9]

		
<p>[CE 1] Indigenous hunting in Sápmi: traditional calendar of ptarmigan (<i>Lagopus lagopus</i>) hunting conflicts with the imposition of national hunting season regulations in northern Fennoscandia. Hunting is allowed to start earlier, which results in substantial disturbance towards the birds by non-local hunters. This constitutes not only an injustice towards the Sámi people, but also has impacts on the breeding success of ptarmigans. (Photo by Daniel Bargas).</p>	<p>[CE 2] TK-based farmers, new peasantry in the EU: TK-holders mostly manage comparatively small farms, while larger farms benefit disproportionately from EU agricultural subsidies. Moreover, smaller farmers have bureaucratic and structural disadvantages when applying for agricultural subsidies (Kirylyuk-Dryska et al. 2020), resulting in billions of € being misspent from a social and conservation perspective (Scown et al 2020). (Photo by Sebastian Wahlhütter)</p>	<p>[CE 3] Norwegian foragers are environmental stewards through their practices of care (e.g., weeding of invasive species, assisting dispersal of plants under harvest pressure) and monitoring of vegetation (Teixidor-Toneu et al. 2023). Yet, foraging is now listed as a major threat while collaboration between foragers and Red Listing authorities is still absent. (Photo by Pål Karlsen)</p>
		
<p>[CE 4] Traditional fishers in Malta have a deep knowledge of the resource and the ecosystem. However, artisanal fishery is rapidly disappearing, being replaced by industrial fishery. In addition to elevated risk of overfishing, this process also leads to a disruption of traditional social-ecological fishery systems, marginalization and loss of subsistence in small-scale fishing communities, and loss of traditional</p>	<p>[CE 5] Spanish transhumant herders The continuity of trashumance (seasonal migration between ecological regions) depends partly on its related TEK, which is linked to the maintenance of trashumance of foot (Oteros-Rozas et al., 2013ab). This practice is threatened by restrictions and impediments to mobility as well as legal disadvantages of long-distance mobility between different governing entities in Spain. (Photo by Berta Martín-López)</p>	<p>[CE 6] Romanian small-scale farmers (Carpathians) Most species-rich semi-natural grasslands of Romania are managed by traditional farmers. They safeguard not only specific cultural traditions but endangered domestic breeds (Ivaşcu and Biro 2020). Inadequate EU policies conflict, simplify and uniformize these inter-generational agro-silvo-pastoral land-use systems. The CAP subsidies expose them to excessive</p>

ecological knowledge (Said and MacMillan 2020). (Photo by Franck Ruffiot)		bureaucracy, unfair regulations and schedules, penalties and other abuses. (Photo by Cosmin Ivaşcu)
		
<p>[CE 7] <i>Svinjars</i> (Serbia): Free-range pig keeping in forests and marshes has been a widespread practice in Europe (Molnár et al. 2021). The last representatives were expelled from their forests in 2020, and knowledge transmission was disrupted. <i>Svinjars</i> only got support from some foresters and conservationists, but mostly only informally and with limited impact. (Photo by Zsolt Molnár)</p>	<p>[CE 8] Traditional pastoralists in Sardinia</p> <p>Local transhumant herders in the Gennargentu Massif have played a key indirect management role for millennia, creating a human-modified environment of high biodiversity value. Nevertheless, environmental organisations' lobbying led to the creation of the "pristine" National Park of Gennargentu and Orosei Gulf, over-riding pastoralists protests. Source: (Heatherington 2012; Bassi 2012). (Photo by Peter Giovannini/Alamy)</p>	<p>[CE 9] Hungarian herders (Hortobágy) have a highly respected and supported intangible heritage (folk dances, songs, cloths, handicrafts) but no meaningful formal participation in protected area management, even when conservation grazing is vital (Molnár et al. 2020). However, there is often meaningful and friendly informal cooperation with dedicated rangers and researchers, which can help resolve some conservation conflicts. (Photo by Sándor Karácsony)</p>
		
	<p>[CE 10] Winegrowers from Gaillac and Faugères who have opted for organic practices are happier when they are able to limit pollution on their estate, increase biodiversity in their vineyards, and form strong social relations and knowledge-sharing networks. These survey results from researchers at the</p>	

	CNRS and the University of Toronto also reinforce the worth of collaborative action - winegrowers value the pleasure they get from their work, while respecting and reinforcing the links that unite them with their vineyards. (Photo by Pauline Monge)	
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Fig. 1. Case examples of conservation-relevant social injustices towards TK holders in Europe

4. Best practices to resolve social injustices that impact TK holders

The social injustices detailed above lead to a range of psychological, material, social, political, and economic harm and disadvantages, as well as constrain the opportunities of TK holders and reduce their freedom and dignity (Martin et al. 2016). These pressures can generate legacies of reduced cultural engagement, taking a toll on peoples' mental well-being, including feelings of shame, low cultural self-esteem and insignificance (Fernández-Llamazares et al. 2021). EU has a responsibility under international instruments such as the Declaration of the Rights of Peasants and the Declaration of the Rights of Indigenous Peoples (which applies to the Sámi people in northern Fennoscandia), to ensure that they can continue their ways of life (if they wish to do so), that is so often beneficial for conservation in cultural landscapes. Responses to redress past and ongoing harm are urgent. Many of Europe's landscapes of conservation interest are within areas inhabited or managed by TK holders, so increasing conservation efforts within such areas will not be possible or justified without their engagement, consent and partnership (IPBES 2018).

There is a diversity of ways to overcome social injustices towards TK holders related to conservation activities (Table 2). Martin et al (2016) identified appropriate responses for each of the categories of recognition injustice: 1) affirmation of multi-culturalism for non-recognition based on cultural relations of power; 2) affirmative recognition of difference and economic and political redistribution for status inequalities; 3) prioritisation of traditional knowledge and political and economic change for European colonization; and 4) liberal pluralism and deliberative public debate for value universalism and lack of participation (Martin et al. 2016). These generic responses can be tailored to the European context and potentially deliver many benefits (Table 2).

Injustices related to cultural relations of power can be addressed through education, requiring respect for cultural norms, establishment of trust-based relationships, involvement in media where TK holders can share their views, objectives and values with the wider public, and through mutual understanding of how cultural landscapes function (Hill et al. 2020, Molnár and Babai 2021; Table 2, row 1). Status inequalities caused by cultural and economic forces can be resolved by redesigning the financial support

to balance unjust competition with food industry, and increase economic viability and sustainability of management practices (Burton and Paragahawewa 2011, Table 2, row 2). The injustices caused by colonisation by Eurocentric, modernist knowledge production can be addressed through decolonizing the ways research and collaborations are carried out, identifying common interests between conservationists and TK holders, fostering knowledge co-production, participatory and TK holder-led research (Johnsen et al. 2017; Kis et al. 2017; Berkes 2021), and by changing national legislation to resolve rights violations (Table 2, row 3). Value universalism can be softened by increased participation of TK holders in management decisions, developing widened knowledge bases for conservation that also includes TK holders' knowledge, furthermore by re-contextualizing school curricula by including traditional knowledge where relevant and, importantly, helping the ongoing maintenance and adaptation of conservation-relevant traditional knowledge (Fernández-Llamazares et al. 2021), including working on innovative, tradition-based solutions (Molnár et al. 2020) (Table 2, row 4). The lack of participation as injustice can be overcome by strengthening TK-holder NGOs and networks and capacities to improve self-representation (Fernández-Giménez et al. 2021) and using culturally appropriate approaches and environments in collaborations, for example, in protected area management planning (Table 2, row 4).

Table 2. Potential responses to social injustices (listed in Table 1) and related benefits for TK holders and conservation

	Categories of recognition injustice (Martin et al. 2016)	Responses to social injustices	Benefits for people and nature
1	Cultural relations of power (Hegelianism).	<i>Disrespect and misrepresentation.</i> Education (incl. cultural training for actors working with TK holders) can have a significant role in changing these understandings. Actors need to respect traditional social norms and rules, recognize and protect non-tangible cultural heritage, and build mutual trust through cultural respect, awareness and sensitivity.	<i>Respect, improved management.</i> Respectful perceptions could lead to less frustration among TK holders, and better cooperation with other stakeholders. Respect and trust can lead to improved conservation management, TK holders can also become partners in developing more sustainable relationships between nature and the wider society.
		<i>Invisibility.</i> There is a need for higher involvement of TK holders in media, for example, inviting TK holders to collaborative design and preparation of media	<i>Better representation, less conflict.</i> If voices heard, TK holders can share their views, objectives, values with the wider public leading to a better representation and respectful

	Categories of recognition injustice (Martin et al. 2016)	Responses to social injustices	Benefits for people and nature
		programs, incl. discussions about actual challenges and future visions and necessary actions.	understanding. Decision makers at all levels (incl. conservationists) could avoid and resolve 'unnecessary' conflicts caused simply by misunderstandings and lack of information.
		<i>Misunderstanding.</i> Inter- and transdisciplinary research can help change understanding in all subjects relating to cultural landscapes (including pushing natural scientists' boundaries of what a cultural landscape is).	<i>Mutual understanding.</i> Better understanding of the knowledge, roles and values of TK holders would help integrate them respectfully and meaningfully in management and conservation actions and the development of more appropriate regulations.
2	Status inequalities caused by cultural and economic forces (critical theory).	<i>Economic vulnerability.</i> Redesign of financial support to increase competitiveness in markets is needed, together with awareness raising about the importance of traditionally produced food.	<i>Just compensations.</i> Fair competition can lead to increased economic value of traditional management for TK holders and of habitats where traditional products are produced, which would also provide stronger arguments to protect these often high nature-value areas (incl. cultural landscapes) for future generations.
		<i>Political vulnerability.</i> There is a need to re-design perverse and inefficient regulations and decrease bureaucratic loads, through respectful and meaningful participation of TK holders in decision-making systems.	<i>Encouraging regulations.</i> Culturally appropriate regulations would decrease frustration, and minimised bureaucracy would leave more time and energy for 'real' work. Culturally appropriate regulations could lead to better cooperation between TK holders and other stakeholders, better trade-offs in conservation compromises, and more flexibility in management.
3	Colonisation by Eurocentric, modernist knowledge	<i>Unethical collaborations.</i> There is a need for respectful, decolonized, ethical and reciprocal relationship between researchers/conservationists and TK holders, and to foster knowledge co-	<i>Ethical relationships.</i> Collaborative work with researchers and conservationists could increase respect for TK and TK holders, and decrease their frustrations. Respect for TK holders' knowledge could lead to more efficient

	Categories of recognition injustice (Martin et al. 2016)	Responses to social injustices	Benefits for people and nature
	production (decolonial theory)	production, participatory and TK holder-led research in ways that reflect parallel validation.	identification of common interests, a wider knowledge base for efficient and evidence-based conservation management, and an ongoing maintenance and adaptation of conservation-relevant traditional knowledge.
		<i>Rights violations.</i> There is a strong need to decolonize land and water-use related regulations in Europe, change national and local (e.g. protected area) legislation to recognize historical continuity, access and management rights.	<i>Legal security, strengthened stewardship.</i> Re-establishing local land and water-use rights would increase land stewardship responsibility of local users and strengthen relational values of the young generations. Strengthened (and longer-term) stewardship responsibilities would lead to improved conservation of natural resources, incl. biodiversity.
4	Value universalism, lack of participation (capability theory)	<i>Disconnection.</i> Need to establish NGOs and networks with other TK holders regionally and globally to help collaborative actions. Actors need to work with culturally appropriate environments, respecting diverse styles of engagement, and also to acknowledge the time needed for TK holders for meaningful participation.	<i>Better collaboration.</i> Increasing the number of people experienced in inter-and-transdisciplinary boundary crossing would help collaborative activities both for TK holders and decision makers, incl. conservationists. Capacity building would also improve self-representation by TK holders.
		<i>Decontextualised education.</i> There is a need to support culturally appropriate education curricula that include traditional knowledge and values. Supporting TK holder-led biodiversity monitoring could help the continuation of local information gathering on the environment and improve intergenerational knowledge transmission.	<i>Maintenance of TK.</i> Improved knowledge transmission to the younger generations could help keep traditions alive and adaptive. Ongoing monitoring of the environment by TK holders could lead to ecologically deeper discussions on local conservation management, including working on innovative, tradition-based solutions.
		<i>Lack of inclusivity.</i> There is a need for collaborative definition of problems and goals in conservation, co-design of and dialogues on adequate protected area	<i>Improved participation.</i> Inclusive approaches could result in less conflicts, less frustration, and better compromises both culturally and ecologically. Involvement could help TK holders

Categories of recognition injustice (Martin et al. 2016)	Responses to social injustices	Benefits for people and nature
	management, and the application of Free Prior Informed Consent (FPIC) is needed.	to understand conservationists, and discuss with them, in a meaningful way, the best solutions for effective conservation management that also takes local livelihoods and culture into consideration.

There are several local and regional examples in Europe of how social injustices were and are being actively resolved and/or prevented, using the tailored responses described in Table 2. For example, Via Campesina (eurovia.org) is a confederation of peasant farmer organisations working to improve the legal, political and social situation and societal recognition of peasants at EU-level. The association *Perspektive Landwirtschaft* (perspektive-landwirtschaft.at) is an Austrian platform to support the extra-familial transfer of farms, and the related intergenerational transmission of traditional knowledge. The protection and restoration of transhumance drive roads in Spain provides space for safe movements of transhumant herders between summer and winter pastures while this road network also benefits wild species, such as plants, ants and bees (Hevia et al. 2016). Establishment of milk collection points for small producers in Romania provides support for marginalized traditional food producers who, on the other hand, maintain species-rich semi-natural mountain grasslands (Babai et al. 2021). Women herders in Spain (Fernández-Giménez et al. 2021) established a network (<https://ganaderasenred.org/>) which helps raise their voice and improve marketing. Norwegian seed savers (<https://kvann.no/>) have established successful collaborations with genebanks and archives internationally to revive centuries-old farming practices. In northern Fennoscandia there is increasing recognition of the cultural legacies of Sámi land uses and cultural practices in forest dominated landscapes (Östlund and Norstedt 2021). As a case in point, evidence derived from Sámi traditional knowledge and oral history has been used as a form of legal evidence in court to recognize Sámi land and resource rights in a contested area of Sweden (Östlund et al. 2020). The Terra Lemnia project (terra-lemnia.net/en) aims to conserve and restore traditional high-diversity agro-pastoral ‘mandras’, and thereby recognize the traditional heritage of the Greek island Lemnos and their TK-holders. The revitalization of local, highly efficient guarding dog breeds as a traditional method to prevent predation on livestock in the Carpathians also helps maintain large carnivores’ populations (Ivaşcu and Biro 2020). Furthermore, long-term collaborative research programs with meaningful participation of TK holders in countries such as Spain, Hungary and Romania increase the understanding of the ecological impacts of traditional practices, and help resolve conservation conflicts

(Oteros-Rozas et al. 2013a; Kun et al. 2019; Molnár et al. 2020). Co-designing and co-producing culturally appropriate materials (e.g. books, films) with TK holders for better understanding of their worldviews, values, knowledge and practices can also effectively help shape public mindscapes (Meuret and Provenza 2014; Biró et al. 2020).

European TK holders are often underrepresented in global conservation institutions, for example in the negotiations of the Convention on Biological Diversity (CBD) including the Local Biodiversity Outlooks report (Forest Peoples Program et al. 2020), and in the assessments of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). However, in the Indigenous Peoples and Community Conserved Territories and Areas (ICCA), the Globally Important Agricultural Heritage Sites (GIAHS) and the International Year of Rangelands and Pastoralists (IYRP), the participation of European local TK holders has been notably strengthened. Successful cases of social injustice resolutions from outside Europe (see Box 1) also indicate that there is much space for improvements in Europe to learn, adapt and innovate the ways we can overcome social injustices related to conservation.

Box 1. Case Study: Our Knowledge Our Way in caring for Country

TK-holders in Australia are in the unique situation of holding information from the oldest continuous culture in the world, dating back at least 65,000 BP. Nevertheless, the knowledge of these Indigenous Peoples has until recently been poorly understood and little appreciated by the non-Indigenous settlers. *Our Knowledge Our Way in caring for Country*, best-practice Guidelines led by Indigenous Peoples and based on their experiences (Woodward et al. 2020), is leveraging much greater respect and recognition for both the knowledge and knowledge holders. The Guidelines showcase how they are strengthening their knowledge to build sustainable futures through their stewardship of land, water and sea Country. More than 100 Indigenous authors contributed to the work.

The Guidelines identify four key practices for working effectively with TK holders:

- **Strong partnerships** – respect and recognition that honours cultural protocols and the principles of free, prior and informed consent.
- **Strengthening Indigenous knowledge** – access to traditional land and sea territories, revitalising knowledge, language and culture through active practice.
- **Sharing and weaving knowledge** – using Indigenous-led and co-developed tools to work with scientific knowledge systems and scientists.
- **Indigenous networks** – facilitating peer-to-peer learning opportunities for traditional knowledge holders to build solidarity, capability, and strength.

Collaboration among and led by TK holders in Europe could provide similar guidance, tailored to their unique perspectives and experiences.



Traditional Owners and knowledge holders from different groups in the Kimberley region of north-west Australia using a 3D map to share stories about their Country. Photo: Pia Harkness. Reproduced with permission of the Traditional Owners



Djarra, traditional owners and knowledge holders in south-eastern Australia, do a smoke cleansing first with our Elders before sharing knowledge and *wi* (cultural burning of our Country). Photo: R. Hill. Reproduced with permission fo the Dhelkunya Dja Land Management Board

Replicating, upscaling and networking of these best practices is urgently needed, which in turn requires supportive legislation, programs and funding schemes both at the national and EU levels. The scale and range of activities to resolve social injustices experienced by TK holders in Europe, adds weight to the argument that transformative change across societies' institutions is required for biodiversity conservation policy and practice (IPBES 2018). More specifically, the EU can advance recognition of TK holders and their knowledge systems by removing obstacles to their ongoing and long-term relationships with their traditional territories (Fernández-Llamazares et al. 2021). While this is often seen as beneficial for conservation in cultural landscapes, it should be considered as a moral imperative rather than as a means to an end for conservationists. As so aptly expressed by Martin et al. (2016): „The responsibility to do this stems from the responsibility to prevent harm and to strive to ensure people have the capabilities to live in dignity. Responsibility is not evenly distributed but falls more to those in a position of power to effect change, and those who have the privilege of benefiting from conservation whilst not being exposed to the corresponding costs.”

At least three funding instruments provide major financial support for biodiversity conservation in the EU: the Structural and Cohesion Funds (SCF), the LIFE programme, and the Common Agricultural Policy (CAP). We suggest revising such funding mechanisms to better integrate and recognize the contributions of TK holders to the conservation of Europe's cultural landscapes.

5. Conclusions

A substantially advanced recognition of TK holders is vital for the future of species-rich, high nature-value cultural landscapes in Europe, but is above all, a social justice imperative. Evidence is accumulating that traditional knowledge, and its role in conservation, is strengthened through activities that support the recognition aspects of social justice. Recognition justice requires supporting the maintenance of TK holders' social and cultural institutions, and their capability to practice and revitalise their traditional management systems. This is inextricably linked to European efforts to address biodiversity loss and underpin success of the recently approved Kunming-Montreal Global Biodiversity Framework, including its articles and provisions on traditional knowledge and the recognition of Indigenous Peoples and local communities.

We argue that the social-ecological systems based on traditional land-use practices and knowledge that still exist in Europe deserve special and increased scholarly and policy attention. Considering that neither the species-rich ecosystems TK holders developed and maintain nor the knowledge and culture of traditional communities are maintained through the often socially unjust compensation strategies of agri-environmental schemes and other European incentive systems, transformative change in conservation policy and practice is called upon. To be politically legitimate and effective, incentives and regulations for conservation in Europe should engage with the claims, knowledge and rights of TK holders.

Evidence shows that conservation actions are more effectively implemented when mutual understanding and usefulness for local communities is emphasized and processed along with external conservation goals. Mutual understanding and knowledge co-production between TK holders and other stakeholders can lead to better compromises in management and regulations (i.e., better for nature, better for people) and increase the resilience of local livelihoods.

Aspects of social injustices identified in this perspective paper need to be resolved in the next decade in close collaboration with and through the meaningful involvement of TK holders for Europe to meet the biodiversity goals established in the Kunming-Montreal Global Biodiversity Framework. TK holders should have a lead place at the table in discussions about policy and planning for the lands in which their knowledge systems are grounded. The ongoing functioning of local, low-external-input agricultural systems in the EU is vital for food resilience in an era of pandemics, energy crises and as a response to mitigate the impacts of Russia's invasion of Ukraine. One of our aims with this perspective paper is to draw attention to the time-tested, place-based knowledge systems of TK holders that can contribute to the transformative change so widely called upon by IPBES and CBD.

It is not enough to save traditions for folklore stage performances and to document them in scientific publications and databases. The only possible way to keep alive traditional knowledge and practices is to maintain their adaptive character. Sustaining traditional knowledge requires safeguarding not only the knowledge itself, but most importantly, the social and ecological spaces where this knowledge is enacted, transmitted, and shared. Not only threatened animal and plant species, but the vulnerable and often-

forgotten TK holders of Europe call for urgent action, including the resolution of the many social injustices they continue to face while struggling in making a living in some of Europe's most biodiverse landscapes.

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