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FOOD SOVEREIGNTY AND THE REGENERATION OF TERRACED LANDSCAPES

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ABSTRACT

The emerging food sovereignty paradigm offers a viable alternative for food, farming and well-being in terraced landscapes and the territories they are embedded in. This paper first defines 'food sovereignty' and briefly describes the origins and history of this policy framework for food and agriculture. The second part of this paper then discusses some of the key ecological, economic, political and social challenges for the spread of food sovereignty to more people and places. The paper argues that by putting farmers and other people at the centre, food sovereignty can allow the historically important architects and custodians of terraced landscapes to regenerate local ecologies, economies, and cultures as part of a new modernity.

Keywords: food sovereignty, terraced landscapes, agroecology and circular systems, local economic regeneration, democracy, redefining modernity and well being

SOVRANITÀ ALIMENTARE E RIGENERAZIONE DEI PAESAGGI TERRAZZATI

SINTESI

Il paradigma emergente della sovranità alimentare offre valide alternative per il cibo, l'agricoltura e il benessere nei territori e nei paesaggi terrazzati. Questo articolo definisce innanzitutto la "sovranità alimentare" e descrive brevemente le origini e la storia di questo quadro politico per il cibo e l'agricoltura. La seconda parte di questo articolo è una discussione sulle principali sfide ecologiche, politiche e sociali per la diffusione della sovranità alimentare. Nell'articolo si sostiene che mettendo al centro gli agricoltori e le persone in generale, la sovranità alimentare può fornire agli architetti e ai guardiani storicamente importanti dei paesaggi terrazzati di rigenerare le ecologie, le economie e le culture locali come parte di una nuova modernità.

Parole chiave: sovranità alimentare, paesaggi terrazzati, agroecologia e sistemi circolari, rigenerazione economica locale, democrazia, ridefinire modernità e benessere

INTRODUCTION

Terracing, which is basically grading steep land such as hillsides into a series of level benches (or steps), was known in antiquity. Historically, it was practiced thousands of years ago in widely different areas such as Central Africa and the Philippines. Terraced agriculture has taken many forms during agriculture's long history and continues to be a prominent method for food growing today. Some of the better-known forms of terraced agriculture come from South America, where people such as the Inca successfully developed and practiced it for centuries (Denevan, 2001). Many of the mountainous regions of Asia also have an extensive history of terraced agricultural systems. The Hani of Yunnan Province in Southern China, for example, have for centuries incorporated terraced food production within the forested ecosystem of the Ailao Mountains (UNESCO, 2018). In Java (Indonesia), animal husbandry and vegetable growing are integrated in a steep, artificially terraced environment where gravity, gradient, and water flow help disperse nutrients throughout the food system in upland areas. And in ancient Mediterranean agricultural landscapes with features such as dry stonewalls and terraces are linked with the agricultural roots of most modern Mediterranean societies (Bevan and Conolly, 2011; Kizos and Koulouri, 2006).

Terraced landscapes everywhere reflect the interaction between nature and people, as well as between the past and present. As co-constructions by people and nature in specific places, terraced landscapes embody the knowledge, skills, and labour of local communities as well as the past and present actions of the earth, air, water, plants and animals. As producers of what are often aesthetically beautiful multifunctional landscapes, rural people who co-create terraces are simultaneously architects, builders, engineers, farmers, and artists (Figure 1). Indeed, the renewal and sustainability of terraced landscapes intimately depends on the continued presence and actions of farmers and rural people in these cultural landscapes.

However, terraced landscapes are in decline today with the outward migration of rural communities who have, historically, been the architects of these cultural landscapes. In Europe for example, terraced landscapes have been eroded or abandoned due to changes in land use management caused by technological developments and the influence of the Common Agricultural Policy (CAP) (MacDonald et al., 2000). Under the CAP, the commercialisation and industrialisation of agriculture have increased productivity and focused agricultural activity on more fertile and accessible land. In many areas this has led to a decline in traditional labour intensive practices and marginal agricultural land is being abandoned in terraced landscapes.

This post-war trend of agricultural abandonment in Western Europe has been particularly marked in moun-

tain areas (MacDonald et al., 2000). A recent inter-ministerial study has shown that this trend is speeding up in counties like France where 10 000 farmers *per year* leave farming before reaching retirement age (this represents one third of the total number of farmers who quit farming every year). At the same time, young people are unable to enter farming or find it hard to do so whilst retired farmers receive a very small pension (ASP, 2016). The reasons for leaving farming in France are similar to those squeezing producers out of food and agriculture in many other parts of the world: i) banks refusing to give loans; lack of cash; inability to reimburse money borrowed for farm investments; ii) impacts of multiple crisis (climate change, illnesses, market volatility...) "*Farm enterprises are less and less able to absorb impacts of two consecutive years of crisis*" (ASP, 2016); iii) isolation; lack of recognition; insufficient income for long day's work; and suicides as a major cause of farmer death before retirement age (ASP, 2016).

This reduction of the number of farmers in terraced landscapes and elsewhere is associated with increasingly unsustainable food, farming and land use practices. According to several international reports like the IAASTD (2009) "*Business as usual is no longer an option*" because i) all relevant biophysical indicators are turning negative, fast, steeply, dangerously; ii) the emerging context is beyond human experience; and iii) the costs of mitigation, adaptation, remediation are rising sharply (IAASTD, 2009; MEA, 2005; UNCTAD, 2013).

The starting point of this paper is that fundamental reversals in policy and practice are urgently needed to sustain the multiple benefits and functions of terraced landscapes. I argue that the emerging food sovereignty paradigm offers a viable alternative for food, farming and well-being in terraced landscapes and the territories they are embedded in. By putting farmers and other people at the centre, food sovereignty can allow historically important architects and custodians of terraced landscapes to regenerate local ecologies, economies, and cultures as part of a new modernity.

After briefly describing the history of food sovereignty and its key features, I discuss some of the challenges that will need to be addressed for a widespread shift to food sovereignty in different contexts.

A BRIEF HISTORY OF FOOD SOVEREIGNTY

Throughout the world, farmer organisations, indigenous peoples, civil society and new social movements—rather than academics or professional policy think tanks—are the prime movers behind a newly emerging food sovereignty policy framework. This alternative policy framework for food and agriculture is also a citizens' response to the multiple social and environmental crises induced by modern food systems. These multiple crises have been described in great detail in several reports which all call for fundamental and urgent changes in

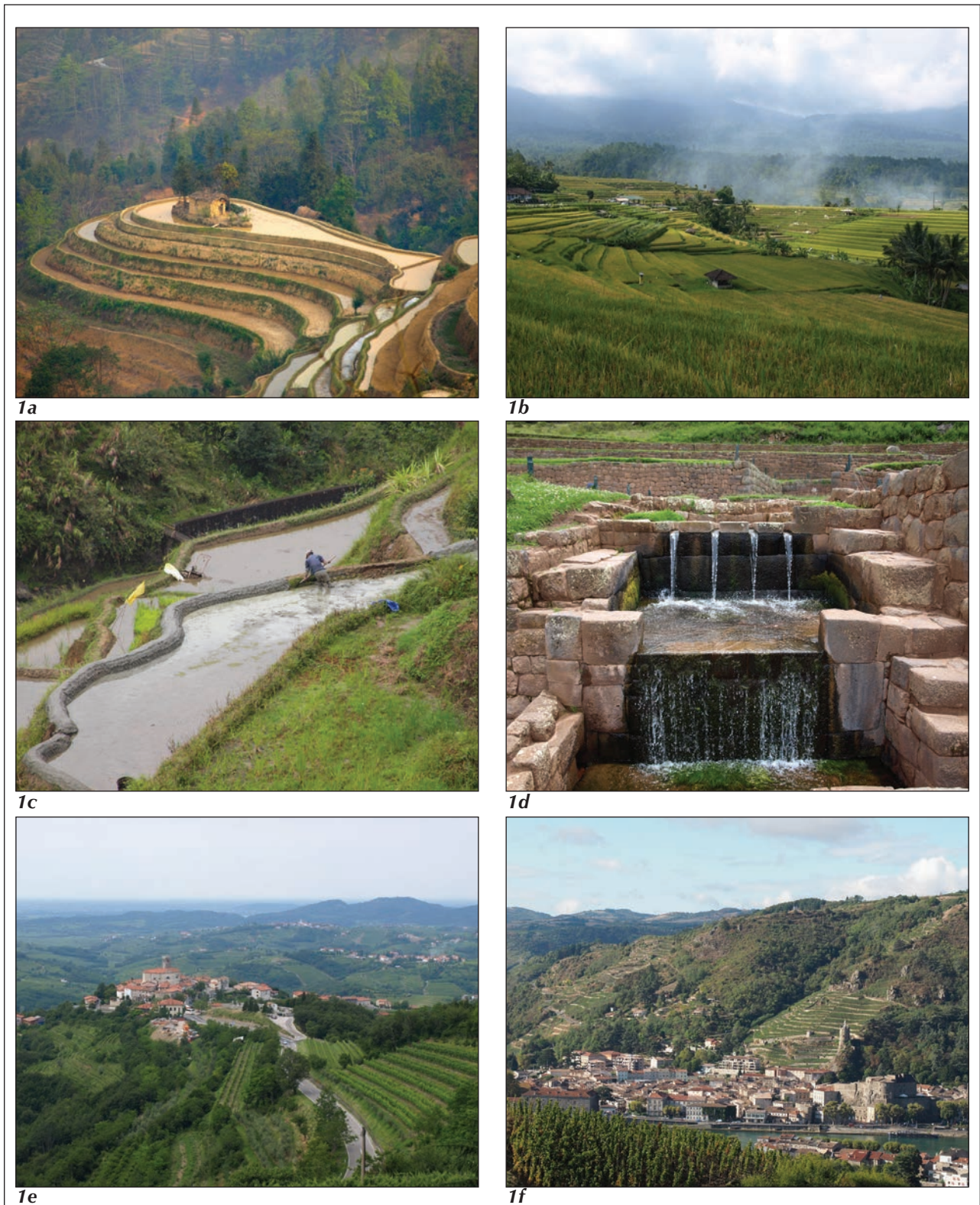


Figure 1: Terraces built and maintained by rural people using their knowledge and skills as landscape architects, engineers, farmers, water harvesters, natural resource managers, and artists: 1a: China – Yuanyang – Red River; 1b: Indonesia – Bali; 1c: Philippines – Ifugao – repairing rice terraces before planting the seedlings; 1d: Peru – Tapon – water works; 1e: Slovenia – Goriška Brda; 1f: France – Rhone – Hermitage (Photo credits Timmi Tilmann).

food and agriculture to eradicate hunger and achieve other Sustainable Development Goals (e.g. IAASTD, 2009; FAO, 2018).

The term food sovereignty was first brought to international attention at the World Food Summit organised by the United Nations Food and Agriculture Organisation in 1996. It was put forward by *La Vía Campesina*¹ an international movement which co-ordinates organisations of small and medium-sized producers, agricultural workers, rural women, and indigenous communities from Asia, America, and Europe. During the 1996 World Food Summit, *Vía Campesina* presented a set of mutually supportive principles as an alternative to the world trade policies and to realise the human right to food. In their statement, *Food Sovereignty: A Future Without Hunger* (1996), they declared that “*Food Sovereignty is a precondition to genuine food security*” (La Vía Campesina, 1996).

Since 1996, subsequent declarations and documents by *La Vía Campesina* and other organisations have built on these principles (see Pimbert, 2008). For example in 2007, the Nyéléni Forum on Food Sovereignty in Mali brought together 600 representatives of family farmers,² indigenous peoples, landless people, migrants, pastoralists, forest communities and artisanal fishers, as well as civil society organisations, academics and researchers, rural workers, youth organisations, consumers, environmental and urban movements from more than 80 countries. The Nyéléni Declaration affirms the centrality and primacy of ‘peoples’³ in framing policies and practices for food, agriculture, environment and human well-being:

Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations. It defends the interests and inclusion of the next generation. It offers a strategy to resist and dismantle the current corporate trade and food regime, and directions for food, farming, pastoral and fisheries systems determined by local producers. Food sovereignty prioritizes local and national economies and markets and empowers peasant and family farmer-driven agriculture, ar-

tisanal fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability. Food sovereignty promotes transparent trade that guarantees just incomes to all peoples as well as the rights of consumers to control their food and nutrition. It ensures that the rights to use and manage lands, territories, waters, seeds, livestock and biodiversity are in the hands of those of us who produce food. Food sovereignty implies new social relations free of oppression and inequality between men and women, peoples, racial groups, social and economic classes and generations (<https://nyeleni.org>).

Over the last two decades, the concept and practices of food sovereignty have thus been discussed, debated and defended under the leadership of *La Vía Campesina*, and with the support of a growing number of other organisations, social movements and citizens throughout the world (Desmarais and Nicholson, 2013). However, many of the central ideas of ‘food sovereignty’ build on a long tradition of agrarian history and peasant struggles. Historically, various strands of agrarian social thought have also influenced the theory and practice of food sovereignty – and continue to do so today. These influences include (Pimbert, 2018):

- agrarian collectivism, as well as social anarchism and libertarian socialist thought – all of which view peasants as progressive agents of change;
- Marx’s view that capitalism induces a fundamental metabolic rift between society and nature;
- peasant studies and agrarian social theory; and
- post-development theory.

These traditions of radical thought have deeply influenced peasant struggles for self-determination and the right to food sovereignty. For example, Proudhon’s ‘principle of federation’ and Bakunin’s proposals on collectivist anarchism informed the consciousness and agency of an impoverished peasantry in Spain. During the Spanish civil war (1936–1939), the peasants of Andalusia and Aragon established communal systems of land tenure in a range of terraced landscapes. In some cases, they abolished the use of money for internal transactions, setting up free systems of production and distribution, and creating a decision-making procedure based on popular assemblies and direct, face-to-face

1 La Vía Campesina is an international movement that brings together peasant organizations of small and medium-sized producers, agricultural workers, landless people, women farmers, migrants and indigenous communities from Africa, Asia, the Americas, and Europe. It is an autonomous, pluralistic movement, independent of all political, economic or other denominations. La Vía Campesina (LVC) comprises about 164 local and national organizations in 73 countries and represents about 200 million farmers altogether. For more details see: <https://viacampesina.org/en>.

2 Farmers’ refer here to smallholder peasant/family crop and livestock farmers, herders/pastoralists, artisanal fisherfolk, landless farmers/rural workers, gardeners, forest dwellers, indigenous peoples, hunters and gatherers, and any other small-scale users of natural resources for food production. The majority of the world’s food producers are small family farmers.

3 People is a group of persons who belong to the same culture, ethnicity, race or nation. When more than one such group is referred to ‘people’ becomes ‘peoples’.

democracy. In those parts of Spain not overrun by Franco's troops, about three million men, women and children were living in collectivized communes over large areas (Leval, 1975).

Elsewhere in India, Kropotkin's ideas on agrarian and industrial mutualism (Kropotkin, 1898) influenced Mahatma Gandhi's views on *Swaraj* (self-rule) and development based on economic self-reliance (*Sarvodaya*) to end poverty through improved agriculture and small-scale cottage industries in every village of India – from the plains to the terraced lands of hills and mountains.

Similarly, the enduring struggles of indigenous peoples⁴ for self-determination, control over their ancestral territories, and their right to protect their knowledge systems and lifeways all echo and amplify the vision of food sovereignty put forward by peasant organizations. Many indigenous peoples' movements, such as the Zapatistas in the Chiapas of Mexico, promote food sovereignty as part of their struggles for self-determination, decolonization, cultural affirmation, autonomy, and gender equity (Gahman, 2016).

INCREASING VISIBILITY AND INFLUENCE

As a concept, food sovereignty has moved from the margins and gained much more visibility over the last ten years in particular (Desmarais and Nicholson, 2013). The term is increasingly recognized by some of the United Nations organisations, several governments, and a growing number of academic research centres and universities. For instance, several recent international reports on world food and agriculture mention 'food sovereignty' as a possible option for more sustainable agricultural development (e.g. IAASTD, 2009; HLPE, 2016). Countries like Mali and Senegal have included food sovereignty principles in their national policies. Constitutional recognition of the right to food sovereignty has been achieved in Ecuador, Bolivia and Nepal. And in both national and international policy fora, it is now common to hear civil society organisations (CSOs) advocate for specific policies in support of food sovereignty. Food sovereignty movements call for significant policy and institutional changes at international and national levels, including:

Enabling national policies and legislation

- Implement equitable land reform and redistribute surplus land to tenants, within a gender inclusive rights-based approach to environment and development;

- Reform property rights to secure gender-equitable rights of access and use of common property resources, forests and water;
- Protect the knowledge and rights of farmers and pastoralists to save seed and improve crop varieties and livestock breeds, – for example by banning patents and inappropriate intellectual property right (IPR) legislation;
- Re-introduce protective safeguards for domestic economies to guarantee stable prices that cover the cost of production, including quotas and other controls against imports of food and fibre that can be produced locally;
- Introduce policies that guarantee fair prices to producers and consumers, as safety nets for the poor;
- Re-direct both hidden and direct subsidies towards supporting family farmers, small scale producers and food workers in order to encourage a shift towards diverse, ecological, equitable and more localized food systems;
- Increase funding for, and re-orientate, public sector research and development (R&D) and agricultural/food-sciences extension towards participatory approaches and the co-construction of knowledge by scientists and farmers;
- Broaden citizen and non-specialist involvement in framing policies, deciding on research funding priorities, setting upstream research agendas, and validating knowledge, – as part of a process to democratize science, technology and policy making for food, farming, environment and development.

Enabling global multilateralism and international policies

- Re-orient the end goals of trade rules and aid, so that they contribute to the building of local economies and local control, rather than international competitiveness;
- Manage supply to ensure that public support does not lead to over-production and dumping that lowers prices below the cost of production—harming farmers in North and South;
- Set up international commodity agreements to regulate the total output to world markets;
- Create regional common agricultural markets that include countries with similar levels of agricultural productivity. For example: North Africa

4 Indigenous peoples are defined by the Special Rapporteur of the UN Economic and Social Council Sub-Commission on Prevention of Discrimination and Protection of Minorities as follows: "*Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal system*" (UN ECOSOC, 1986). According to the UN International Labour Office (ILO), indigenous peoples constitute about 5% of the world's population, or nearly 370 million people spread across over 70 countries (www.ilo.org/global/topics/indigenous-tribal/lang--en/index.htm; <http://www.fao.org/family-farming-2014/en/>).

and the Middle East, West Africa, Central Africa, South Asia and Eastern Europe;

- Protect these regional common markets from the dumping of cheap food and fibre. Use quotas and tariffs to guarantee fair and stable prices to marginalized small-scale producers, food processors and small food enterprises. Prices should allow small-scale producers, artisans and food workers to earn a decent income, invest in and build their livelihood assets;
- Challenge corporate investor rules and transform the current international investment law regime. The expansion of current foreign investment rules should be blocked and arbitration processes should be reformed to ensure transparency and fairness. Alternative rules should also be constructed and implemented, focusing on the responsibilities of international investors to ensure sustainable development and enhance environmental, labor and human rights protection;
- Create mechanisms to ensure that the real costs of environmental damage, unsustainable production methods and long-distance trade are included in the cost of food and fibre;
- Ensure clear and accurate labelling of food and feedstuffs, with binding legislation for all companies to ensure transparency, accountability and respect for human rights, public health and environmental standards;
- Restrict the concentration and market power of major agri-food corporations through new international treaties, competition laws and adoption of more flexible process and product standards;
- Develop international collaboration for more effective antitrust law enforcement and measures to reduce market concentration in different parts of the global food system (concerning seeds, pesticides, food processing, and retailing as well as financial investors);
- Co-operate to ensure that corporations and investment banks as well as their directors are held legally responsible for breaches in environmental, labor and social laws as well as in international agreements;
- Co-operate on a global level to tax speculative international financial flows (US \$1,600 thousand million/day), and redirect funds to build local livelihood assets, meet human needs, as well as regenerate local ecologies and economies.

CHALLENGES FOR REGENERATING TERRACED LANDSCAPES THROUGH FOOD SOVEREIGNTY

A focus on the following challenges is now required to further amplify and scale out food sovereignty to more people and places in terraced landscapes and the wider territories they are embedded in.

Inventing a new modernity and peasant identity

Most of the world's food is still grown, collected and harvested by over 2.5 billion small scale farmers, indigenous peoples, pastoralists, forest dwellers and artisanal fishers. Worldwide, over 72% of the total number of farms are family farms which are smaller than one hectare in size (Lowder et al., 2016). Collectively, these smallholders are by far the largest investors in farming and land (HLPE, 2013), and produce at least 70 percent of the world's food according to the UN Food and Agriculture Organization¹ This food is primarily sold, processed, re-sold and consumed locally, with many people obtaining their incomes and livelihoods by working at different points of the food chain, from field to plate. Worldwide, these diverse and localized food systems provide the foundations of people's nutrition, incomes, economies and culture. But despite these contributions, local food systems—and the organizations and local institutions that govern them—are largely ignored, neglected or actively undermined by governments and corporations.

In both capitalist and Marxist Nation States, the dominant view of modernizing development envisions having less people living on the land and depending on localized food systems. Nation States have encouraged an exodus of people from rural areas to work in industry and urban-based trade and services (Desmarais, 2007; Perez-Vitoria, 2015; Pimbert, 2008). Many development policies are based on the belief that those subsistence producers who continue to farm, fish, rear livestock and harvest forests and common property lands should 'modernize' as quickly as possible. They should become fully commercial producers by applying industrial food and agricultural technologies that allow for economies of scale and integration of global value chains (Desmarais, 2007). Those who cannot make this transition should move out of farming and rural areas to seek alternative livelihoods. Over the last century, this view of modernity has encouraged and legitimised the exodus of rural communities dependent on terraced landscapes for their livelihoods (Mendras, 1970).

Moreover, the global restructuring of agri-food systems led by corporations has increasingly marginalised or displaced local food systems, with a few transnational corporations gaining monopoly control over different links in the food chain (Clapp and Fuchs, 2009; Clapp, 2018). An important part of this process is what Ivan Illich has termed 'radical monopoly': 'the substitution of an industrial product or a professional service for a useful activity in which people engage or would like to engage', leading to the deterioration of autonomous systems and modes of production (Illich, 1973). Radical monopolies replace non-marketable use-values with commodities by reshaping the social and physical environment and by appropriating the components that enable people to cope on their own, thus undermining freedom and cultural diversity (Illich, 1973).

This favoured modernization agenda is seen as inevitable by most corporations and governments. Contesting and neutralising the agency of this hegemonic view of modernity is a major challenge for the food sovereignty movement. The idea that small-scale producers and indigenous peoples as a group are bound to disappear reflects just one vision of the future—it is a political choice that relies on specific theories of change that is rejected by social movements working for food sovereignty. In response to a development model geared to ensuring the extinction of small-scale food providers, *La Vía Campesina* is redefining what it means to be a ‘peasant’. A process of ‘re-peasantization’ is slowly unfolding as more national and regional organizations proudly embrace the term ‘peasant’ to describe themselves (Desmarais, 2007; Perez Vitoria, 2015).

Throughout the world today, growing numbers of smallholders and citizens are affirming this alternative peasant identity and projecting an alternative vision of modernity rich in meaning and hope for the future. Many voices in social movements claim that food sovereignty can help give birth to this new modernity by regenerating a diversity of autonomous food systems in rural and urban spaces (Pimbert, 2008; Perez-Vitoria, 2015). Embraced by an increasing number of youth, this vision of modernity and diversity rejects the idea of development as a process of commodification of nature and social relations (Rist, 2013). It looks to other definitions of ‘the good life’ – including *Buen Vivir* or *Sumak Kausai* in Latin America, *De-growth* in Europe, feminist subsistence perspectives (Mies and Bennholdt Thomsen, 1999) and *Ecological Swaraj* in India (Kothari et al., 2014). Transformation for food sovereignty must be increasingly grounded in a radical pluralism that honors and nurtures cultural diversity by enabling many paths to the realization of self-defined aspirations and definitions of the ‘good life’. Reversing the decline and loss of terraced landscapes partly depends on inventing such plural definitions of modernity.

A shift from linear to circular food systems

Food sovereignty goes much further than a critique of *agricultural production* alone. It questions the structure of the entire food system. The globalized supply chains that feed the world rely on the intensive use of fossil fuels from field to plate – for fertilizers, pesticides, production, processing, transport, refrigeration and retailing – and are a major contributor to climate change and pollution. In France, for example, the national food system generates more than a third of the country’s greenhouse gas (GHG) emissions (Jancovici, 2010). In turn, the energy sector that supports industrial food and farming also has a damaging ecological footprint: exploring oilfields, mining tar sands, building dams, and logging forests all serve to degrade and emit large quantities of the greenhouse gases that fuel climate change.

Industrial food, energy and water systems are fundamentally unsustainable. Their linear, and increasingly globalized, structure assumes that the Earth has an endless supply of natural resources at one end, and a limitless capacity to absorb waste and pollution at the other. Nature is treated as if inert and constantly available for unlimited and free exploitation by human society. However, planetary limits are being exceeded through the multiple impacts of industrial food and farming (Steffen et al., 2015). ‘*Business as usual is no longer an option*’ (IAASTD, 2009) – a fundamental transformation is needed rather than reforms that leave the basic structure of modern food systems unchanged. An alternative to the conventional development model is to shift from linear systems to circular ones that mimic natural cycles (Jones et al., 2012). This is done by adopting a circular metabolism that reflects the natural world and builds on two key ecological design principles. The first is that nature is based on nested and interacting cycles—for example, carbon, nitrogen, phosphorus, and water. The second is that ‘waste’ is converted into a useful form by natural processes and cycles, ensuring that waste from one species becomes food for other species in the ecosystem.

Food sovereignty looks to the science of agroecology to develop more climate-friendly and sustainable food and farming systems (Rosset and Altieri 2017). Agroecology’s central idea is that agroecosystems should mimic the biodiversity levels, cycles, and functioning of natural ecosystems. Such agricultural mimics, like their natural models, can be productive, pest-resistant, nutrient-conserving, and relatively resilient to stresses such as climate change. Agroecological methods used on farms and the surrounding landscape include for example genetic mixtures, crop rotations, intercropping, polycultures, mulching, terracing, the management of diverse micro-environments for nutrient concentration and water harvesting, agro-pastoral systems, and agroforestry. There is an emphasis on re-use, creating closed loop systems. For example, in the mulberry grove-fishpond system of China’s Pearl River Delta, the leaves of the white mulberry tree are fed to silkworms, which produce silk. Compost from the mulberry tree and silkworm excrement are applied to the fishpond to feed the fish, and the excrement of the fish and other organic matter from the bottom mud is used as fertilizer for the trees. The design of biodiverse, energy-efficient, resource-conserving, and resilient farming systems is based on mutually reinforcing agroecological principles that combine the modern science of ecology with the collective knowledge, practices, and ecological rationale of indigenous and peasant agriculture(s) throughout the world (Altieri, 1987; FAO, 2018).

From its initial emphasis on ecology for the design of sustainable agriculture, agroecology now emphasizes the study of the ecology of food systems (Gliessman, 2014). At the food system level, agroecological pathways to sustainability build alternative

Box 1. Circular systems for sustainable living in terraced landscapes

In Spain, farmers and other citizens involved in the *Catalan Integral Cooperative* (CIC) in the city of Barcelona and nearby municipalities are weaving together a decentralised and distributed network of circular systems under democratic control and popular self-management. For example, CIC has successfully developed a functional logistics network for the transport and delivery of organic food produced by small producers in peri-urban and rural areas of Catalonia. CIC's *Network of Science, Technique and Technology* has developed technologies and machines adapted to the particular needs of small producers working in terraced landscapes. Peri-urban agroecological farms that feed local schools work with cooperatives for the digital manufacture of farm tools and they are also part of a territorial network of peer-to-peer production, small scale industrial ecologies, as well as local exchange networks and social currencies. These socio-technical innovations not only foster a new agrarian-industrial mutualism (between town and countryside; they also help restore a sense of selfhood, competency and active citizenship (<https://cooperativa.cat/en/>).

food networks that re-localize production and consumption. This approach seeks to reinforce connections between producers and consumers and integrate agroecological practices with alternative market relationships within specific territories (Gliessman, 2014; CSM, 2016).

This re-localisation of food systems within territories also calls for the integration of food, energy and water within circular systems. This is a major challenge for the food sovereignty movement because radically new knowledge must be developed for that purpose (Pimbert, 2018). Throughout the world, substantial increases in public funds are needed to generate new knowledge that can help replace specialized and centralized supply chains with webs of decentralized circular systems that link food and energy systems with sustainable water and waste management. Despite official recognition that agroecology has a role to play in meeting the Sustainable Development Goals (FAO 2018), there is very little public funding for research and development (R&D). For example, in the USA, a recent analysis of funding by the US Department of Agriculture (USDA) showed that projects with an emphasis of agroecology based on agroecosystem diversification represented only 0.6 to 1.5% of the entire USDA Research, Extension and Economics (REE) budget (DeLonge et al, 2016). Similarly, funding for agroecological research in the UK represents a tiny 1.5% of the total UK budget for agricultural R&D. The percentage of funds for the development of agroecological solutions is even lower in the UK's official aid programme for Africa, Asia and Latin America. Since 2010, agroecological research projects have received less than 0.1% of the UK's Department for International Development's budget for official aid on food and farming (Pimbert and Moeller, 2018). The lion's share of the UK's overseas aid for agricultural R&D supports Green and Blue Revolution farming as well as industrial food systems and the expansion of global value chains. More broadly, the overseas aid programs of G7 and

European countries used to support agroecological research and innovations in the terraced landscapes of the global South are disappointingly insignificant (Pimbert and Moeller, 2018).

More generally, the food sovereignty movement is increasingly challenged to develop and scale out circular systems that mimic natural ecosystems at different scales, – from individual farm plots to entire cities, by using functional biodiversity, ecological clustering of industries, recycling, and re-localized production and consumption within a territorial-based approach to sustainable living. Experience to date shows that these rural and urban systems are often characterized by: agroecological approaches; ecological design; widespread recycling and reuse; a focus on 'doing more with less'; and the re-localization of production processes, supply chains, and consumption (Jones et al, 2012). Circular systems that combine food and energy production with water and waste management aim to reduce carbon and ecological footprints whilst maintaining a good quality of life through a *controlled process of de-growth in consumption and production* driven by the '8 Rs' described by Serge Latouche: Re-evaluate, Re-conceptualize, Restructure, Redistribute, Re-localize, Reduce, Reuse, Recycle (Latouche, 2009). Last, but not least, such re-localized circular systems can be consciously designed for local control by communities of citizens, – emphasising cooperative, communal, and collective tenure over land, water, seeds, knowledge and other means of livelihood (Box 1). This can enhance the potential for conviviality, autonomy and direct democracy. Making the transition to decentralised and locally controlled circular systems is a major challenge for a transformative food sovereignty that aims to regenerate a diversity of local ecologies and economies in terraced landscapes.

Rethinking economics, trade and markets

In sharp contrast to conventional development, the food sovereignty paradigm seeks to reduce de-

Box 2. Alternative economic principles for agroecology and food sovereignty

- The re-localization of plural economies that combine both market oriented activities with non-monetary forms of economic exchange based on barter, reciprocity, gift relations, and solidarity;
- A guaranteed and unconditional minimum income for all men and women;
- A significant drop in time spent in wage-work and a fairer sharing of jobs and free time between men and women;
- Cooperative, communal, and collective tenure over land, water, seeds, knowledge and other means of livelihood;
- A tax on financial speculations, to fund the regeneration of local economies and ecologies;
- The use of alternative local currencies to regenerate wealth in re-territorialised economies;
- A shift from globalized, centralized and linear food systems to decentralized and democratically controlled circular economies that closely link food and energy production with water and waste management to reduce carbon and ecological footprints in urban and rural settings;
- A general and progressive shift to an economics of social inclusion, freedom and solidarity, – based on the principle of *'From each according to his/her means, to each according to his/her needs'*;
- Economic indicators that reflect and reinforce new definitions of well-being such as conviviality and frugal abundance.

pendence on corporate suppliers of external inputs and distant global commodity markets. This vision for the transformation of the dominant agri-food regime translates into an approach that emphasizes forms of economic organization and regeneration based on:

Re-embedding agriculture in Nature, relying on functional biodiversity and internal resources for production of food, fibre and other benefits. Local endogenous development based on a matrix of resilient agroecological and circular systems that mimic the structure and function of natural ecosystems at different scales;

Farmers distancing themselves from markets supplying inputs (hybrid seeds, GMOs, fertilizers, growth hormones, pesticides, credit, etc.). Reduced dependence on commodity markets for inputs enhances farmers' autonomy and control over the means of production;

Farmers diversifying outputs and market outlets. A greater reliance on alternative food networks that reduce the distance between producers and consumers whilst ensuring that more wealth and jobs are created and retained within local economies: short food chains and local food webs, Community Supported Agriculture, local procurement schemes that link organic producers with schools and hospitals for example, community controlled food processing units, farm-based eco-tourism as places for urban dwellers to discover and reconnect with Nature and rural cultures;

A rediscovery of forgotten resources: local knowledge on crop and livestock management; organic manure and the soil's capacity to sequester and fix carbon and improve the yields and nutritional quality of foods; renewable energies and their decentralized and distributed micro-generation (solar, wind, biogas,

etc.); medicinal plants as a basis for local health care systems;

Trade rules that protect local economies and ecologies: the spread of socio-ecologically resilient food systems depends on: (a) replacing proprietary technologies and patents on biodiversity with locally adapted legal frameworks that recognize farmers' rights and guarantee equitable access to diverse seeds and livestock breeds; (b) replacing global, uniform standards for food and safety by a diversity of locally developed food standards that satisfy food and safety requirements; (c) introducing supply management and import quotas to guarantee stable prices and market outlets for food providers; and, (d) introducing local food, energy, and water procurement schemes for equity, social inclusion and ecological regeneration.

By reducing risks and costs, these forms of economic regeneration and organisation are increasingly important to sustain livelihoods and farming in terraced landscapes in Africa, the Americas, Asia and Europe. For example, evidence shows that agroecological practices that combine indigenous knowledge with modern ecological science reduce costs of production for farmers and also generate good yields as well as other multifunctional benefits (IAASTD, 2009). A large scale comparison of the yields of agroecological/organic farms with conventional farms (Badgley et al., 2007) showed that:

In developed countries, agroecological/organic systems on average produce 92% of the yield produced by conventional agriculture. In developing countries, however, organic agroecological systems produce 80% more than conventional farms. These findings are based on a global dataset of 293 examples.

The materials needed for agroecological/organic farming are more accessible to farmers in developing countries. Poor and marginalised farmers usually cannot afford the fertilisers and pesticides needed for intensive chemical input agriculture. However, organic fertiliser and nitrogen fixing cover crops do not cost much – farmers can produce them on their own farms.

The world currently produces the equivalent of 2786 calories per person per day. If farms worldwide were to switch to organic agroecological methods today, this research found that farms could produce between 2641 and 4381 calories per person per day under an organic-only regime (Badgley et al., 2007).

More generally, a fundamentally different economics is needed for the widespread adoption and spread of the food sovereignty paradigm. A deep rethinking of economics is urgent because throughout the industrial food system and its related sectors (energy, manufacturing, etc.), there is a direct relationship between the huge increases in productivity achieved through the use of automated technology, bio-science applications, re-engineering, and downsizing, and the permanent exclusion of high numbers of workers from employment. This erosion of the link between job creation and wealth creation calls for a much fairer and more gender equitable distribution of productivity gains through a reduction of working hours. It also calls for alternative forms of economic organisation that provide opportunities and local autonomous spaces for the generation of use values rather than exchange values (Gollain, 2000; Latouche, 2003; Mies and Bennholdt Thomsen, 1999; Rist, 2011, 2013; D'Alisa et al., 2014). As indicated in Box 2, these alternative models represent a radical departure from the conventional economics that underpins mainstream environment and development policies today – in both capitalist and Marxist Nation States.

There is no consensus yet within the food sovereignty movement as to what kind of economic arrangements and indicators of well-being are needed. More than ever, food sovereignty transformation depends on a creative re-imagining of economics that explores the rich possibilities of solidarity economics, de-growth thinking, anarchist economics, feminist economics, and other alternatives (Pimbert 2018). This is a major overarching challenge and opportunity to make other worlds possible.

Deepening democracy

Food sovereignty in terraced landscapes calls for greater farmer and citizen participation as well as more direct forms of democracy in the governance of food systems – from field to plate. This view is consistent with one of the clearest demands of the food sov-

ereignty movement: farmers and other citizens should exercise their fundamental human right to decide their own food and agricultural policies (Nyéléni, 2007). The food sovereignty paradigm is indeed perhaps best understood as a process that aims to expand the realm of democracy and freedom by regenerating a diversity of locally autonomous and socially just food systems (Pimbert, 2008).

Social movements committed to a transformative food sovereignty generally seek to reverse the democratic deficit and processes of exclusion that favour the values and interests of powerful corporations, investors, big farmers and technocratic research institutes. This will often require an expansion of *direct* democracy in decision making in order to complement, or replace, models of representative democracy that prevail in conventional policy making for environment and development. This is a major challenge because the commitment to deepen democracy reflects values that fundamentally differ from the dominant worldview in society. First, deepening democracy assumes that every citizen is competent and reasonable enough to participate in democratic politics. However, this requires the development of a different kind of character from that of passive taxpayers and voters. Second, active citizenship and participation in decision-making are rights that are claimed mainly through the agency and actions of people themselves – they are not granted by the State or the market. Third, empowering men and women farmers as well as other citizens in the governance of food systems and the wider ecosystems they are embedded in (grasslands, forests, wetlands...) requires social innovations that i) create inclusive and safe spaces for deliberation and action; ii) build local organizations, horizontal networks and federations to enhance peoples' capacity for voice and agency; iii) strengthen civil society and gender equity; iv) expand information democracy and citizen-controlled media (community radio and video film making, among others); v) promote self-management structures at the workplace and democracy in households; vi) learn from the history of direct democracy; and, vii) nurture active citizenship (Pimbert, 2008). Fourth, only with some material security and free time can people, – both men and women as well as the old and young –, be 'empowered' to think about what type of policies and institutions they would like to see and how they can develop them. For example, free time is needed for men and women to fully engage in, – and regularly practice –, the art of participatory direct democracy. This requires radical reforms in economic arrangements similar to those listed in Box 2. Ensuring that agrarian communities can thrive and prosper also depends on these radical reforms, – they are part of the deeper-seated structural changes required to reverse the worldwide economic genocide of family farmers, pastoralists, forest dwellers, and fishers.

Box 3. Democratizing research for agroecology and food sovereignty

Social movements and activist scholars increasingly view science as part of a bottom–up, participatory and emergent process in which farmers and citizens should take center–stage. In this approach, instead of being passive beneficiaries of ‘trickle down’ development or technology transfer, food producers and citizens participate as knowledgeable and active social agents, including in setting upstream strategic priorities for national research and its funding. In practice, two complementary approaches are proposed as alternatives to the increasingly corporate–controlled research of food and agriculture (Pimbert, 2018):

1. *Supporting bottom–up networks of self–managed research and grassroots innovation as well as citizen oversight over the production of knowledge.* This requires the strengthening of farmer– and citizen–led innovation and sociocultural networks that are organized along more horizontal and egalitarian lines to produce and transform knowledge, – with or without the involvement of professional scientists. Examples include: The *Réseau Semences Paysannes* in France and its approach to agroecological research and participatory plant breeding (www.semencespaysannes.org); the *Campesino a Campesino* movement in Central America; and the social process methodology used in constructing sustainable peasant agriculture, agroecology and food sovereignty in Cuba.
2. *Democratizing public research and increased funding for research on the technical and institutional dimensions of agroecology as food sovereignty.* Deepening democratic participation in public research implies a systemic transformation within existing educational and research establishments. It entails profound changes in academic cultures, in the self–image of researchers and academics, in teaching pedagogies, in research agendas and methodologies, organizational cultures, operational procedures, and in the very role that universities and research institutes play in society. Policy recommendations made by farmer and citizens’ juries on how to democratize the governance of research often focus on changing the determinants of innovation and factors that influence research choices e.g. science policies, public–private partnerships, funding, and ways of working of scientists (see www.excludedvoices.org).

Deepening democracy also implies greater gender justice, and the need for a more feminist theory and practice for food sovereignty. Members of *La Via Campesina* have clearly stated that “*If we do not eradicate violence towards women within the movement, we will not advance in our struggles, and if we do not create new gender relations, we will not be able to build a new society*” (La Vía Campesina, 2008). But despite its critical perspective food sovereignty has not yet incorporated an explicit gender approach that can problematize social relations in patriarchal contexts, adequately value the role(s) of peasant women, and make more visible the relationship between women’s domestic work and care with socio–environmental sustainability (Larrauri et al., 2016; La Via Campesina, 2017) The relative lack of a feminist and gender perspective in food sovereignty also hides from view the many inequalities between men and women in peasant agriculture (Bezner Kerr, 2013) and rural communities in terraced landscapes. As a social movement, food sovereignty needs to develop ways of knowing, new knowledge, and practices which are informed by a feminist perspective that challenges patriarchy and forms of structural violence against women in particular. Given the vital importance of women’s knowledge and work in land care, farming, and food preparation this is an urgent priority.

Horizontal structures for multi–level decision making

New institutional and political structures are needed to combine localism with interdependence for coordinated action across large areas. This is a major challenge for the implementation and spread of food sovereignty. Diverse agroecologies and re–territorialised food systems in which economics is re–embedded in society (cf. Polanyi, 1957) all require strong citizen oversight, inclusive participation, and collective action to coordinate local adaptive management and governance across a wide range of food systems and terraced landscapes in forests, wetlands, coastal areas, grasslands, islands and peri–urban areas. Moreover, nurturing and strengthening citizen–centred food systems and autonomy calls for forms of political and social organisation that can institutionalise interdependence without resorting to the global market or the centralising Nation State.

One option is confederalism, which is a way of linking together several political entities into a larger whole. Confederalism involves a network of people–based, – as opposed to government –, bodies or councils with members or delegates elected from popular face–to–face democratic assemblies, in villages, towns, and neighbourhoods of large cities. When combined with an education for active citizen–

ship, these confederal bodies or councils become the means of interlinking villages, towns, neighbourhoods and agro-ecological regions into a confederation based on shared responsibilities, full accountability, firmly mandated representatives and the right to recall them if necessary (Bookchin, 2015; Öcalan, 2011). The larger and more numerous the linked federations and confederations become, the greater is their potential to exert countervailing power to democratise and decentralise the governance of food systems and their diverse agroecologies. For example, in war-torn Syria and south-east Turkey, Kurdish men and women are putting into practice their demands for autonomy and democratic confederalism (Öcalan, 2011 in a region with many ancient terraced landscapes. They are creating a region-wide web of villages and municipal councils through which they can govern themselves. In this 'stateless democracy' Kurdish communities are formulating their own laws, creating their own parliament, and building their own universities and capacity for research (New World Academy, 2015; TATORT Kurdistan, 2013).

In practice however, food sovereignty movements are increasingly challenged to rely on a twin track approach to further citizen empowerment, democratic change, and the dispersal of power. For example, they can seek power within local and national government through strategies of collaboration and political negotiation, while also maintaining strong community and municipal organising strategies at the grassroots. Multiple lanes for engagement can also be used to link community-based food systems, social movements and allies in political parties with direct local governance strategies. In this regard, the struggle to democratize the governance of research for agroecology and food sovereignty is emblematic as it seeks to create more democratic ways of knowing through two complementary approaches (Box 3).

To different degrees, food producers in these two approaches work closely with supportive researchers and other citizens to decide strategic upstream research agendas and develop research priorities, including the allocation of funds for R&D. They co-produce knowledge and aim to scale out innovations through horizontal networks within and between terraced landscapes. Institutional innovations such as popular assemblies and methods for inclusive deliberative processes such as citizens' juries help create safe spaces for decision making *with*, *by* and *for* farmers and other citizens (Pimbert et al., 2011; Pimbert and Wakeford, 2002). By valuing and working with peoples' knowledge, this transformative process seeks to reverse what Boaventura de Souza Santos describes as 'cognitive injustice' and 'epistemicide' – the failure to recognise the fundamental right of different knowledges and ways of knowing to exist and give meaning to peoples' lives (Boaventura de Souza Santos, 2014).

For both ethical and practical reasons, achieving food sovereignty depends on expanding more direct forms of democracy and inclusion. Methodological and institutional innovations are needed to put hitherto excluded farmers and citizens, – men, women and youth –, at the centre of the co-construction of knowledge, policies, and practices for the local adaptive management and governance of terraced landscapes. This is a major challenge in today's context of growing inequalities, rapid global change, and uncertainty.

CONCLUSIONS

Much of the academic literature on the conservation and management of terraced landscapes focuses on technical aspects and farm level practices. For example, how to address the costs of maintenance of terraced landscapes, or what can be done to prevent the loss of local technologies adapted to unique places. Whilst acknowledging the importance of these technical aspects of terracing, this paper identifies some of the wider social, economic and political processes that are key for the survival of terraced landscapes and their primary caretakers – farmers and rural communities. In this context, 'food sovereignty' offers a promising holistic approach to regenerating terraced landscapes and local livelihoods.

Food sovereignty is a radical alternative to conventional food and agriculture development. Over the last two decades, the concept food sovereignty has rapidly moved from the margins to more centre stage in international discussions on food security and sustainable development. As such, food sovereignty is directly relevant for contemporary debates on the future of terraced landscapes in Africa, Asia, the Americas, Europe and Oceania.

However, major challenges still need to be addressed to enable the large scale uptake and spread of food sovereignty in terraced landscapes and their associated territories. Regenerating local ecologies, economies and culture in territories with terraced landscapes depends on a systemic transformation that combines at least five dimensions of change:

ecological – re-organizing the material basis of food systems in the image of nature to regenerate diversity (genetic, species, ecological) and resilience. Carbon and ecological footprints can be reduced by re-localizing circular systems that combine food and energy production with water and waste management to achieve the SDGs within specific territories.

economic – inventing equitable and socially just forms of economic organization that re-territorialize food systems and wealth production whilst creating free time and livelihood security for farmers and other citizens.

political – expanding direct citizen participation and inclusion in the co-production of knowledge, policies, and institutions for the democratic governance of food systems and the territories they are embedded in.

social inclusion and gender justice – develop ways of knowing, new knowledge, policies, and practices which are informed by a feminist theory and practice that challenges patriarchy and forms of structural violence against women in particular.

a search for a new modernity – rejecting the idea of development as an ever expanding process of modification of nature and social relations. This requires adopting other definitions of ‘the good life’ and modernity based on a radical pluralism that honours and nurtures cultural diversity by enabling many paths to the realization of self-defined aspirations and diverse food systems rooted in terraced landscapes.

PREHRANSKA SUVERENOST IN OBNOVA TERASIRANIH POKRAJIN

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POVZETEK

V sodobnosti so terasirane pokrajine po vsem svetu v upadanju kot posledica izseljevanja podeželskih skupnosti, ki so bile zgodovinsko arhitekti teh kulturnih pokrajin. Nujno so potrebni temeljni preobrati v politiki in praksi za ohranitev številnih družbenih in okoljskih koristi terasiranih pokrajin v Afriki, Aziji, Ameriki, Evropi in Oceaniji. V članku je utemeljeno, da pojavljajoča se paradigma o suverenosti pri preskrbi s hrano ponuja izvedljive možnosti za pridobivanje hrane, kmetovanje in dobro počutje na območjih terasiranih pokrajin in teritorijih, katerih del so slednje. S postavljanjem kmetovalcev in drugih ljudi v središče lahko prehranska suverenost tem zgodovinsko pomembnim arhitektom in skrbnikom terasiranih krajin omogoči regeneracijo lokalnih ekologij, gospodarstev in kultur kot dela nove modernosti. Skozi celovit pogled je v prispevku najprej na kratko opisan izvor in razvoj prehranske suverenosti kot alternativnega političnega okvira za prehrano in kmetijstvo. Nato v nadaljevanju sledi kritična razprava o nekaterih ključnih ekoloških, gospodarskih, političnih in socialnih izzivih, ki jih je treba obravnavati, da bi omogočili širjenje prehranske suverenosti k večjemu številu ljudi in krajev v terasiranih pokrajinah.

Ključne besede: prehranska suverenost, terasirane pokrajine, kmetijska ekologija in krožni sistemi, demokracija, nova opredelitev modernosti in dobrega počutja

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