

Circular economies and the regeneration of land, craft, and biodiversity. Cultural ecologies of connection

Patrick Dillon

Abstract

The idea of a circular economy is based on self-contained enterprises employing local people, producing goods and services from local resources, minimising waste and maximising internal recycling. Historically, farming systems in northern and western Europe operated in circular economies with integral craft practices. We now call this ‘traditional’ farming, and in recent times it has been replaced by industrialised systems, which are generally monocultural, based on the throughput of externally derived inputs, with waste as well as product leaving the system. Chemicals in fertiliser and pesticides are ecologically damaging. Crafts that have had utility for generations become redundant.

This article utilises cultural ecology as a theoretically based, and practically verified, behavioural approach to addressing how we are placed relative to the land and the actions we take within it. Cultural ecological modelling is used to make a case for regenerating traditional farming systems so that they are economically viable modern alternatives to industrial farming. Regenerative business models are emerging connected with environmental and lifestyle matters, such as organic farming, animal welfare, localised cuisine, sustainable fashion, heritage crafts and their products. Other developments are in services catering for the growing demand for leisure, educational, and heritage experiences. Digital technologies and social media globalise the potential market for new products, while the circular systems remain tailored to specific localities. This benefits communities culturally and ecologically, improving biodiversity and human and animal wellbeing by reducing some of the damaging externalities associated with industrial farming. The resurgence of traditional crafts is promoted and intangible heritage enhanced.

Regeneration requires people to have greater involvement in decisions about the management and regulation of their local environment. Devolution is

proposed, which reconciles locally adapted custom with statutory forms of governance. This would promote adaptive cultural ecological governance reflecting the synergistic coexistence of nature and culture.

Keywords: biodiversity, circular economy, craft, regeneration, cultural ecology

Introduction

For millennia we have engaged with our surroundings by creating infrastructure to help us make sense of them, live and work in them, and create narratives that connect and sustain us. By surroundings, I mean the environment broadly defined, that is, the physical and ecological fabric of those parts of Planet Earth that we occupy, along with the infrastructure associated with it, and the social places we create within it. Let us call this 'the land'. Making sense, living, and working are all outcomes of processes of social and material exchange between people and the land, through which we utilise the products of nature as resources for human consumption.

The archaeological and historical records show that for much of human history, the land has been essentially rural with an economy based on plants, animals, and raw materials close at hand or obtained through trade. The associated infrastructure served the many ways in which rural life in the land was played out: hunting, foraging, farming, moving around and settling down, husbanding animals and growing crops, making things, building homes, and engaging in trade (see for example Graeber, Wengrow 2021). These were not environmentally benign ways of living, but their continuity from generation to generation depended on maintaining a viable resource base. Looking after the fertility of soil, and working with the flows and cycles of nature to ensure that supplies of raw materials are not exhausted, were integral to living in the land. This was sustainable living in a very general sense, based on what we would now call 'circular economies'. Production and consumption were largely locally-based and within the means of what the environment could 'afford'. Most waste materials were resources for other productive processes, i.e. they were recycled. The skills and crafts associated with this lifestyle were numerous and varied. Biodiversity flourished in the many different habitats associated with agricultural practices and the resourcing of rural crafts.

The infrastructure associated with living in the land is integral to it. The practices, knowledge, and skills expressed by individuals and communities as they go about their daily activities, their routines and traditions, are part of the story. Our grandparents and the generations that preceded them lived in the land. People and places shaped each other through processes of

reciprocal adaptation. This mode of living in the land is passing into history. Now it is infrastructure rather than 'places' that underpins our sense of who we are. More and more ecological space has been appropriated and turned into places for living and working. The environment has been transformed physically into the hard infrastructure of cities, roads, factories, high-rise buildings, and industrialised agriculture. All of this is maintained and regulated by the soft infrastructure of socio-economic and cultural institutions. Modern infrastructure is global in reach, demanding and controlling. We are immersed in it, physically and virtually. It provides for our needs, and at the same time destabilises climate, depletes resources, compromises biodiversity, and fuels humanitarian crises. The transition has come about very rapidly. We have failed to understand the magnitude of the change involved, and only now are we beginning to consider its implications.

The case I make in this article is part of a larger justification for the need to recover some of the intimacy we once had with the land, and regenerate it to address the environmental crisis and re-make our relationship with Earth (Dillon 2024/25, forthcoming). Greater intimacy with the land brings us closer to nature, and with it a deeper understanding of how Earth sustains biodiversity and provides materials for human enterprise.

The case is made as a theoretically structured, generalised, polemic argument, rather than as an answer to a research question. The theory is based in cultural ecology, a behavioural approach to modelling how we are placed relative to the land and to infrastructure, and the human enterprises that occur within them. Methodologically, this depends on making theoretically justified and practically verified systemic connections. Underpinning this approach is integrativism, which is an adjunct to systems theory. The general argument is that epistemic integration is necessary for modelling human-environment transactions because there are no perfectly isolated parts, and because every property is related to other properties (Bunge 1983). Systems and their parts may be mapped as generalised, descriptive, explanatory frameworks. These are presented as a series of diagrams: theoretically justified behavioural models (figures 1–3, 8, 9), and operational models that can be demonstrated in practice (figures 4–7). The generality of the argument means that some key terms, for example, 'traditional', 'rural', 'local', should be treated relatively and fluidly rather than as absolutes. Each of them is part of a continuum: traditional-modern/industrial; rural-urban; local-national/global. Their uses and interrelationships as descriptive terms will vary from place to place and context to context.

I examine one area of human enterprise that is synonymous with the land, that is, farming. The history of farming reveals diverse land-use practices and infrastructures that integrate livestock and crop production with

maintenance of soil fertility. Historically, they were locally-based, circular economies of self-contained enterprises, employing local people, producing goods and services from local resources, minimising waste, and maximising recycling. I set out a generalised cultural ecological model of farming, and then look in more detail at sheep husbandry, contrasting historical examples of circular economies with the throughput systems of industrial agriculture, and describing how a circular economy based on sheep farming works in Norway. Finally, I look at ideas about new relationships between nature and culture, and how these might be governed to be compatible with regeneration generally and circular economies specifically.

Cultural ecologies of farming

Earth is not a static place. Physical and ecological processes are dynamic. Change is omnipresent. For millennia, the human population has been part of this dynamic, now it is a dominant influence. Human activities and the fabric of the environment are now so entangled that the world can be thought of as a cultural ecology. It is made up of myriad sub-systems which are also cultural ecologies, ranging in scale from oceans and biogeographical regions, to locally distinctive enterprises in farming and in manufacturing and service industries, to the activities of families and individuals.

The term cultural ecology is attributed to Julian Steward, a mid-twentieth century American anthropologist, to frame ideas about systemic connection between people and their environment, and the 'tensions' that exist between them (Steward 1955). His 'multilinear' theory of culture is based on two premises. First, variation in the complexity of social organisation is limited by the environment to within a range of possibilities, and these differ from culture to culture. Second, generalisable things can be said about the processes of cultural change, which Steward calls 'cultural laws', and that recurrent forms, processes, and functions in different societies have similar explanations. Based on these two premises, human-environment relationships can be represented as 'cultural ecologies'. Bennett (1976) gives a detailed historiography of the ideas leading to the development of Steward's theory.

Steward was interested in societies and economies as cultural ecologies. In more recent formulations of cultural ecology, I have proposed that, additionally, if the theory is to describe everyday life, it must reflect the processes by which it is enacted through human experience in day-to-day activities (e.g. Dillon 2018). Human behaviour is integral to the theory.

The mechanism I propose posits that perceptual 'moments of being', together with existing knowledge and beliefs, find expression in behaviours, and in the things people make, including artefacts and infrastructure. These

activities are ‘cultural ecological transactions’. Modelling the transactions involves integrating day-to-day behaviours, which are the basic drivers of change, with more ‘structured’ behaviours arising from accumulated human experience and understanding, which influence the trajectories of change. A generalised cultural ecological model is shown in figure 1. Philosophically, this approach is compatible with ‘new realism’, that is, ideas proposed by Maurizio Ferraris and others about relationships between how things are in themselves, and how they become known to us. Ferraris makes a distinction between ‘ontological reality’, the actual structures of the world whether perceived or not, and ‘epistemological reality’, the structure of knowledge, concepts and constructs we have for the world. Perception delves into the world to express the reality of that world as it manifests to us and influences our behaviours (Carta 2016).

The left-hand circle symbolises how people engage with their environment ‘in the moment’, literally through their daily actions, routines, and practices. In these moments, behaviour, the environment in which the behaviour takes place, and the context of that engagement, each signified by a double ended arrow which together make up the triangle, co-construct each other. Some of this ‘in the moment’ engagement is consciously recognised, acknowledged, and acted upon, but more typically the engagement is simply the backdrop to everyday life, we are aware of our environment but are not actively acknowledging our responses to it and impacts on it.

The right-hand circle symbolises behaviours that people typically undertake in the light of previous experiences and accumulated knowledge. Metaphorically, we might say they are the ‘rules of engagement’. The rules are not necessarily formalised, but we know that in any given situation we do such and such, and that this is different from what we do in other situations. Behaviour of this type is known as ‘context dependent’. The situations so formed are ‘relational’, they are ‘relative’ to the context, that is, the social and cultural infrastructure in which they take place. In the diagram, the circle represents the context, enclosing the arrows depicting people’s engagement with the environment. In contrast, the co-constitutional behaviours in the left-hand circle arise ‘in the moment’. They reflect the unique transactions that take place between individuals and their surroundings in each place and at specific times.

Although we can model these two forms of engagement as separate entities, they do not happen in isolation of each other. How we act ‘in the moment’ is always influenced by previous experiences, even though we may not be consciously drawing on them, and what we do at given moments contributes to our accumulated knowledge and skill. In other words, co-constitutional

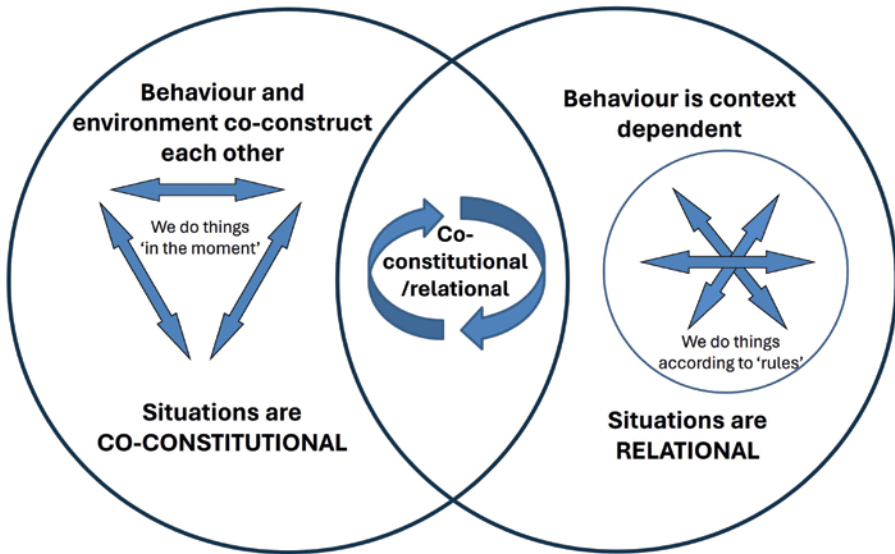


Figure 1. The cultural ecological dynamic. *Diagram by Patrick Dillon.*

and relational behaviours constantly re-form each other in ways that are themselves co-constitutional and relational, or as Marton (1993) puts it: “systematic understanding of the world is derived through cumulative organisation and rearrangement of experientially acquired understandings of the world.” The cumulative, collective outcome of this activity is places of human enterprise as people engage with the affordances of their environment. The cultural ecological transaction is the interplay between the subjectivity of lived experience, and the need to bring order to our understanding of the environment in the purposeful activities we undertake in living and working.

This generalised cultural ecological model of behaviour can be adapted for specific human enterprises. In this article, the focus is with farming in rural situations. Individual farming enterprises operate along a broad continuum ranging from ‘traditional’ to ‘industrial’. Similarly, ‘rural’ is a relative term, and here it is used in the context of countryside where the dominant land-use is farming and allied practices. Figure 2 is the cultural ecological model modified to represent ‘traditional’ farming, that is, the type of farming, in its many different variations, that has been practiced for generations and is associated with people living in the land and practicing rural crafts.

Typically, traditional farming is labour intensive. There is a high level of day-to-day engagement with the processes of cultivation and husbandry (the left hand circle: ‘in the moment’ behaviours co-constituted with the environment). These practices are continually adjusted to take account of changing

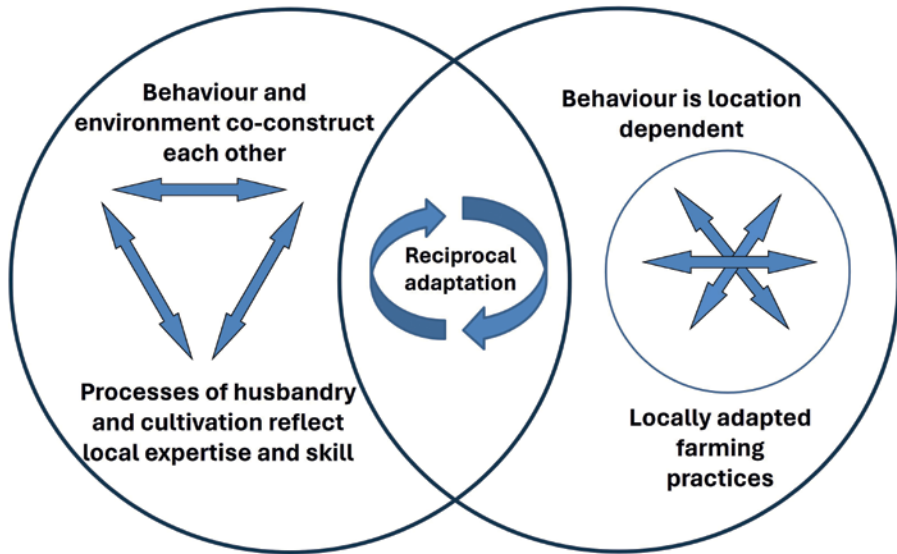


Figure 2. A cultural ecological model of 'traditional' farming. Diagram by Patrick Dillon.

local conditions (right hand circle: the 'rules' of working with the opportunities and constraints of local resources and infrastructure).

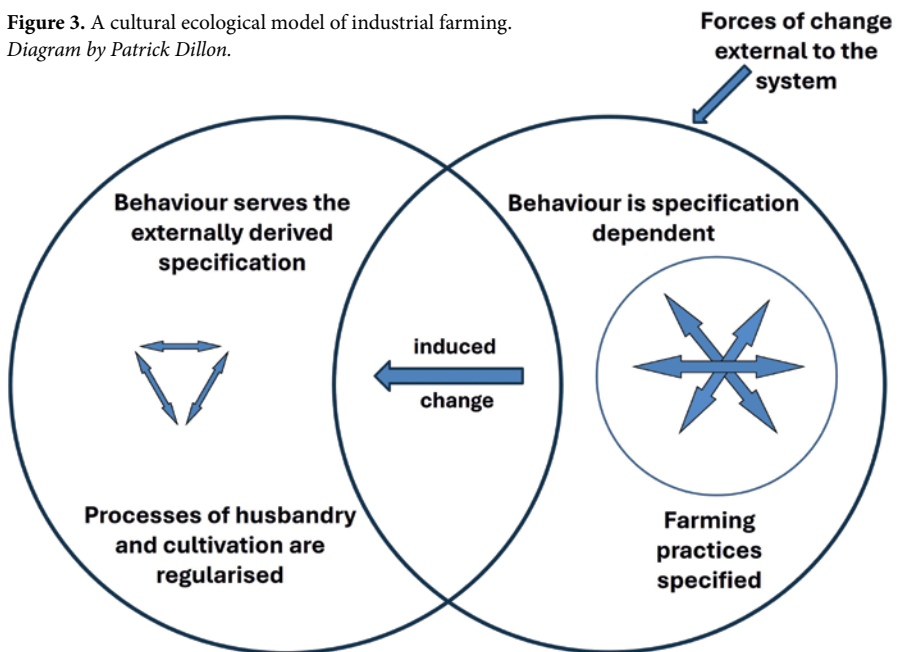
Farming in western and northern regions of Europe, incorporating both crops and livestock, are typically integrated systems that exemplify the cultural ecological model. (Fussell 1972, outlines the regional historical context). For example, 'three and four course' systems are where cereals are rotated with root crops and fodder crops in three or four year cycles. Soil fertility is maintained by applying manure from the livestock. Historically, production in these farming systems was tailored to and constrained by local ecological conditions, and thus coexisted with an associated and adapted wildlife. The working of the farm, and the processing of its products, were dependent on a multitude of craft skills which were also locally adapted.

Contrast traditional farming with the industrialised agriculture which now dominates global production. Figure 3 models farming towards the extreme end of the traditional-industrial continuum. Inputs are external to the system, e.g. the system requires large quantities of fossil fuel derived energy, fertilisers, and pesticides. Labour is largely mechanised, so fewer people have less direct engagement with the land (the reduced symbol for 'in the moment' behaviours in the left hand circle). Farming enterprises tend to be monocultural, both for economies of scale and to control competing organisms. Practices are pre-specified and applied with the aid of control technology, rather than being adapted 'on the ground' and 'in the moment'

by a labour force. Soil in the industrial system is a largely sterile production medium. Biodiversity is reduced because there is less place for nature in the intensive land-use, and it is compromised by toxic pesticides and agricultural chemicals. Biodiversity is more than just high profile plants and animals. It includes countless microbes, invertebrates, and fungi that break down and decompose organic matter, and regulate the levels of air, water and nutrients in the soil. Mechanisation means there is less demand for traditional crafts and the skills associated with them, so many of them have disappeared. In the UK, many of the crafts lists as ‘critically endangered are associated with farming or the rural sector (Carpenter, Lewis 2023).

To get a better understanding of the differences between traditional farming associated with ‘living in the land’, and farming that is dependent on industrial infrastructure, we can look in detail at one specific farming enterprise, sheep husbandry in northern and western Europe.

Figure 3. A cultural ecological model of industrial farming.
Diagram by Patrick Dillon.



Cultural ecologies of sheep husbandry

Northern and western Europe is a connected land mass differentiated mainly by climate and topography. The Baltic-North Sea-Atlantic seaboard has been important historically in the movement of people, and with them ways of living, including farming and husbandry practices (Cunliffe 2001). The original sheep of Europe came from the Middle East about 5-6,000 years ago,

and travelled with people as they migrated through the continent. Retroviral analysis undertaken at the University of Tartu shows that traces of primitive retrotypes are shared by modern breeds across northern and western Europe. Soay sheep, Finnish Landrace, and Estonian Kihnu are some of the closest ancestors (Rannamäe, et al. 2020).

Climate, topography and systems of land-use are the main environmental factors that have influenced the emergence of sheep breeds. In Europe there are now several hundred varieties, derived from the ancestral animals through selective breeding. Each breed is adapted to different environmental conditions and has different physical characteristics. Many textile crafts have developed to suit the properties of wool from locally adapted sheep. Over time, the sheep themselves change through selection, partly in response to practical and aesthetic choices made by the farmers who breed them, and the craftspeople who use the wool. There are three main types of traditional sheep husbandry. These can be contrasted with industrial breeding of sheep and textile production, which change the relationships between local traditions and breeds of sheep.

Nomadic transhumance is the oldest traditional method, where people move around the landscape with their animals. It is a form of subsistence living still practiced in parts of the world, notably Mongolia and central Asian countries. A variation is settled transhumance. This was practiced widely in Europe until recently (Costello, Svensson 2018). Animals are moved in the summer months from farmsteads to graze on mountains, uplands, heaths, coasts, and other marginal lands, often accompanied by one or more members of the farming family. In winter, humans and livestock return to the farmsteads. The living is mainly subsistence, but in some cases, it produces a surplus of wool or meat which can be sold to generate income.

A third type of traditional sheep husbandry is associated with integrated farming. Integrated farming systems had their origins in prehistoric times, but in parts of medieval and early modern western and northern Europe sheep became their principle economic driver. Archaeological and historical records for this period attest to the importance of sheep husbandry, wool production, and an associated cloth industry. This is well documented for England (Rose 2018).

The prosperity of the system required not only robust market and trade arrangements, but also a sustainable supply system. Sustainability was based on the maintenance of soil fertility, management of water resources, and cultivation of plants for animal feed and for fulling and dyeing wool, as well as raising animals, all of which contributed collateral benefits to local communities. It was an integrated system of land management that survived for many

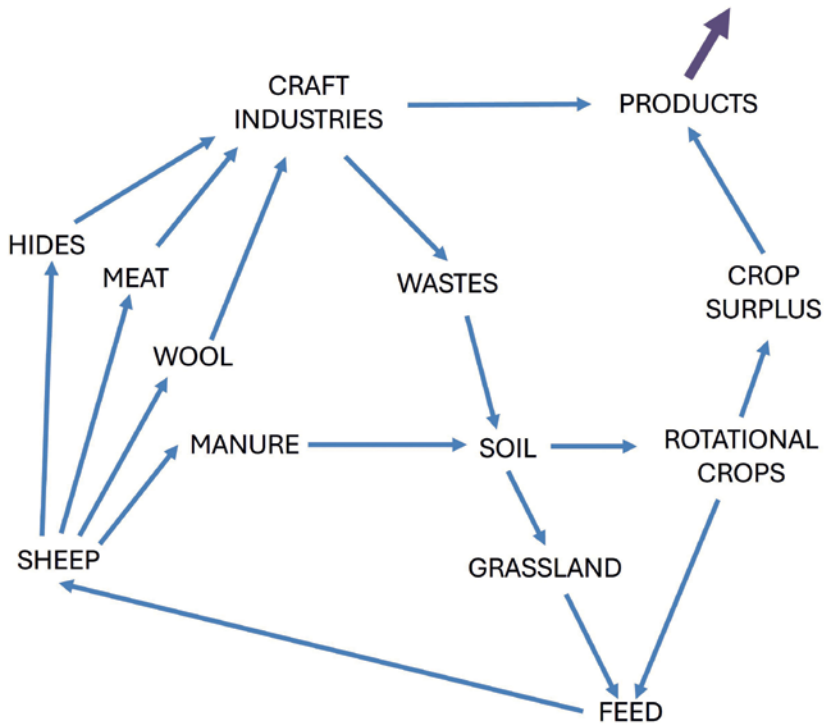


Figure 4. Integrated farming and sheep husbandry.
Diagram by Patrick Dillon.

generations, adapting to changing market and environmental conditions. For the general historical background see chapters 4 and 5 in Hoffman (2014).

No farming system is entirely circular, because it is influenced by naturally occurring events, and by intentional and unintentional inputs from human activities. However, circulation within the system is evident in the diagrammatic representation in figure 4. Animal feed is produced within the system and there is very little waste leaving it, because most of it is reused. The products that leave the system, derived from animal and plant production, and mediated through the labour of human craft, are indicated by the purple arrow in the top right hand corner of the diagram.

Forms of transhumance and integrated farming are still practiced in many places, but the large scale agriculture of today is based on industrialised production. Industrial farming is a monoculture dependent on external inputs of fertiliser and feed supplements in the production of meat, which is the primary income generating, or ‘wealth’ product. In its most extreme form, animals spend the greater part of their lives penned in restricted spaces. Perversely, as Weymouth (2023) notes, this treats animals like plants: ‘plants stay rooted, absorbing their resources from where they stand, but animals

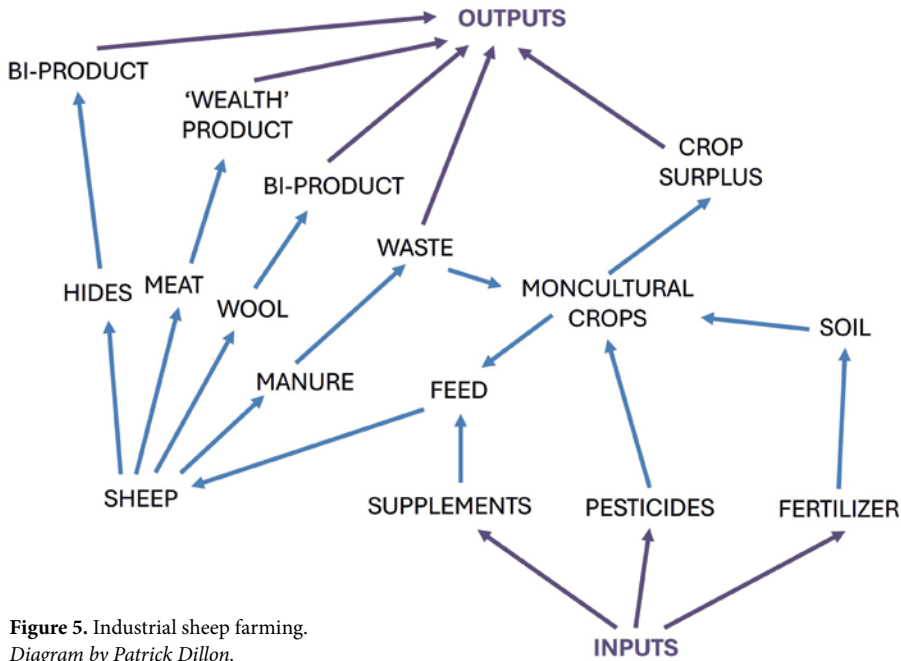


Figure 5. Industrial sheep farming.
Diagram by Patrick Dillon.

should move. Figure 5 shows this to be a 'throughput' system. Some manure is returned to the soil via monocultural crops, including grassland, which is often sown as a short term feed crop, but most of it, along with wool, leaves the system either directly or as low value by-product.

The general economic point about traditional forms of sheep husbandry, is there is value in all parts of the farming system. Sustainable land-use, enriched biodiversity, and associated craft industries come together in an integrated economy. Wool, hides, meat, and manure are all products. In medieval Europe, wool was a 'wealth' product and formed the basis of international trade across the known world via merchants operating locally, and through international trading ports. Manure was essential to maintaining soil fertility (Jones 2012). Sheep were 'folded' on the land so that their manure could fertilise it. The fertile land supported crop rotations, producing cereals and roots. The crops were used to feed the sheep, and the farming family, and any surplus could be sold for profit. The hides, wool, and meat supported craft industries whose waste products also contributed to soil fertility.

Soil fertility depended not only on waste materials and manure from animals, but also on periodically 'resting' the land. This was achieved in forested parts of northern Europe by cutting trees and burning the timber (slash and burn), creating small fields called 'swiddens', which could be used

for growing crops and grazing, and then abandoned to allow the return of tree growth (Tomson, Bunce, Sepp 2016). In more temperate parts of western Europe, grassland in the lowlands was maintained long term for grazing. It was ploughed for short periods for crops and then returned to grazing (Briggs, Courtney 1985, chapter 7). On the uplands and mountains the grass was permanent (Dodgshon 2019). In these forms of land management soils had undisturbed periods in which the invertebrate and fungal populations responsible for nutrient cycling were renewed.

This was the basic historical pattern. It varied from place to place according to topography, ecology, the relative distributions of private and common land, the relative contribution of transhumance, and where the farming community was positioned on a continuum between being self-contained and open to external trade and influence. For a detailed study of how these factors interacted to produce a regionally distinctive farming tradition, but with much local variation in practice, see Dodgshon's (2019) study of the Western Alps.

Generally, where there was access to uplands or coastal grasslands, transhumance was practiced, sheep were moved to the upland or coastal pastures for summer grazing. On lowlands with access to river systems, water meadows were established. This involved diverting water from a river across fields of permanent grassland in the winter months. The river waters kept the frost off the ground and encouraged early growth of the grass, and its sediments contributed nutrients to the soil. The meadows were mown for hay in late spring and then grazed in the summer. Dillon, et al. (2012) explain how water meadows in England were once managed as locally adaptive cultural ecologies.

There were many environmental advantages to the integrated system. It was locally adapted, and the variations in selective breeding helped maintain genetic diversity in sheep. The sheep breeds had different wool properties. There were diverse crafts supporting the working of the land, and the butchery, tanning, and wool sectors. Meat was produced and consumed locally. People were employed locally. There were fewer toxic chemicals, and this benefited wildlife.

The historical story has relevance today as we seek to develop circular economies that support locally-based employment and regenerate the environment. The case rests on realising value across the entire farming system, rather than creating a monoculture with a single income generating product. Many of the practices associated with circular economies have land-use benefits which are increasingly recognised as important for human and environmental wellbeing. However, regeneration is not a call to return to

pre-modern farming. To be viable, modern farming in the traditional mode must be adapted to a globalised economy. If it is to promote environmentally-sensitive forms of land-use and animal welfare, it must have relevance to and influence the choices about lifestyle and consumption made by a mobile and increasingly affluent population.

The example which follows is the Selbu Spinneri, Norway. It is based on the farming enterprises of family Espelien, who work in cooperation with several farmers, including Ola and Brit Vie on Frøya Island in central Norway. The Espelien enterprise combines livestock and horticulture. Sheep are at the centre of it. The sheep live outdoors all year, grazing on coastal pasture. During periods of snow, they are fed a little hay. Manure from the sheep enriches the soil for growing potatoes and vegetables for consumption on the farm.

Fleeces from the sheep are the main income generating product. The fleeces link the farming enterprise to the economy of the local community via the Selbu Spinneri. The Spinneri produces wool which is turned into yarn and felt from which products like bags and mats are made, and courses are offered on aspects of wool work and dyeing. The products and courses generate income streams. Some of the income is fed back into the local economy and the family farming enterprise, and some of it enables commodities to be purchased from outside the local community.

It can be seen from figure 6 that material, energy, and labour flows are internal to the local economy and farming enterprise. The farming family is almost self-sufficient because they run the system with their own labour and with internal recycling. The income they generate maintains the family, and surplus is invested back into the farm. Benefits to the local community and infrastructure are mainly from employment in the Spinneri, and the goods and services derived from the wool. There are intangible benefits: maintaining the biodiversity of coastal pastures, ensuring that the soil is kept in good ecological condition, creating conditions for the continued practice of locally-adapted crafts, all of which contribute to the 'heritage' of the region.

Ingvild Espelien explains that many small farms in the region operate with circular economies, each of them specialising in different animals for producing fibres: angora rabbits, sheep, alpacas. Collectively, they make up an organisation called Fibershed.¹ The fleeces and fibres are sent to the Spinneri in which products are made and sold. The craft processes and tools are locally adapted, and products reflect the locality and in some cases the people who make them. A similar system operates in the Shetland Islands. The colours and motifs of the knitware garments reflect the shades and contours of

1 <https://www.fibershed.no/>

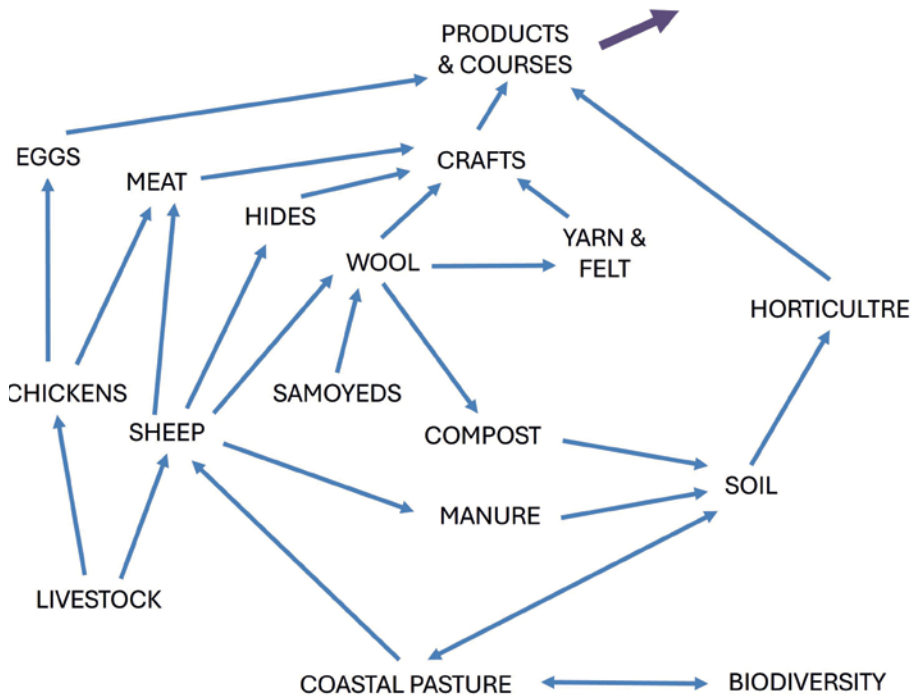


Figure 6. The circular economy at Selbu Spinneri.
 Diagram by Patrick Dillon based on information provided by Ingvild Espelien.

Shetland's cratered peat hills, and the personalities of the people who make them (Brown 2018).

The notion of a circular economy centres around where the system falls on a continuum of openness to external influences. A fully circular economy would be 'closed'. In other words, all its inputs, materials, energy, and labour, would be generated internally and its outputs fed back into the system, everything effectively recycled. In practice, no economic system can be fully closed, since any form of trade, even the simplest barter or exchange between two communities, creates degrees of openness within the system. Circularity is thus relative to the degree of openness and the way the boundaries are defined.

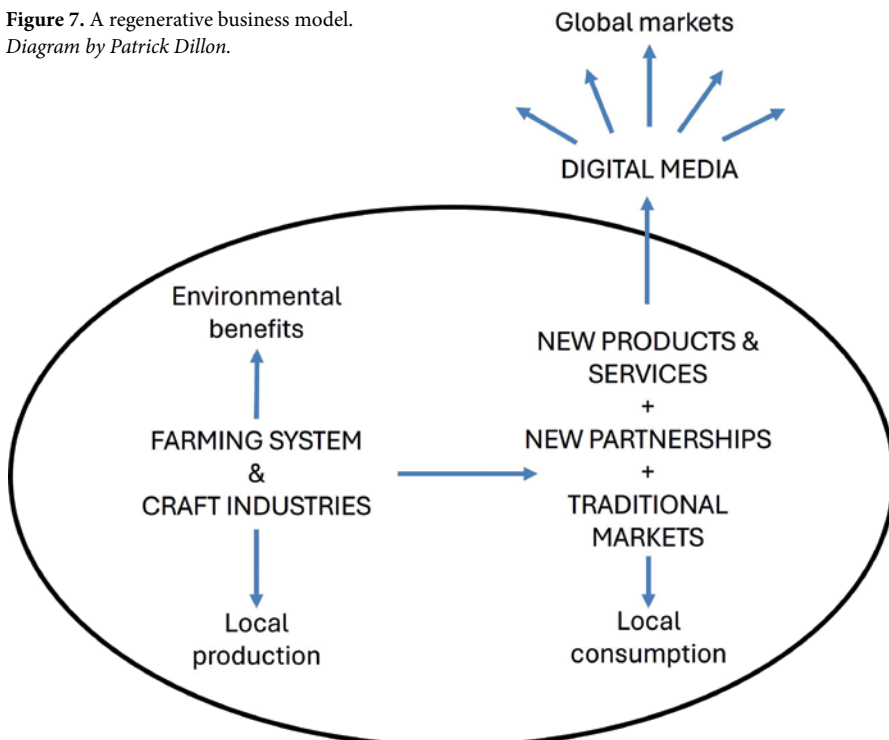
Regeneration and circular economies

A paradox of the industrialised world is that people increasingly want to buy into a consumer lifestyle, but at the same time lament the passing of a pastoral countryside and the plants and animals, and crafts, associated with it. They are concerned about genetically modified crops, excessive use of chemicals, factory production of livestock, and the 'mining' of soil.

Environmentally-sensitive farming with its products and services offer people choices about their lifestyle, leisure activities, and ethics of consumption that align with beliefs about the need to reappraise our relationship with Earth.

Regenerating traditional approaches to land management, and rebuilding circular economies of farming, so that they are a viable alternative to industrial systems requires building economically adaptive mechanisms within the system. Simply replicating approaches that worked in the past is unlikely to produce anything more than subsistence living. Cultural ecologies are characterised by change not stasis. This means finding new products and services and promoting them in ways which connect with environmental, heritage, and lifestyle matters that are important today. Viable business models might be linked to organic farming, animal welfare, traditional cuisine, sustainable fashion, heritage crafts and their products. New services catering for the growing demand for leisure, educational, and heritage experiences are a potential development area. Dillon and Kokko (2017) present a cultural ecological account of traditional crafts and how they respond to social and economic change.

Figure 7. A regenerative business model.
Diagram by Patrick Dillon.



These new enterprises alone will not solve the global crises in land degradation and climate instability, but by connecting with the environmental movement generally they offer routes for like-minded people to make restorative, adaptive relationships with the land on which their cultural ecologies depend. What they all have in common is a concern for localities and individual and collective traditions and responsibilities within them. Localities nest into and blend with each other, and now the world is networked as never before. Digital technologies and social media can facilitate co-operative working and new partnerships. A viable, regenerative business model might look like figure 7.

The Shetland Islands provide an example of how such a model works in practice. In the post oil-boom era, practitioners have embraced opportunities for professional development centred on home and craft. Intergenerational teaching and learning through Shetland Peerie Makkers have introduced a new generation of young people not only to the Shetland way of knitting and design, but to the new style of business practice. Shetland sheep and hand-weaving and knitting are marks of indigenous design, technique, and quality. These enterprises are possible because of the growth of textile tourism, the success of the 'Shetland Wool Week' festival, and the online market for designs and products. 'Shetland Wool Adventures' runs knitting holidays, and its quarterly journal blends informative articles with promotional information. Small businesses in the Scottish Islands are exploring opportunities for engaging with the experiential nature of craft making. This might be done by evoking the embedded physical and emotional qualities of the processes through immersive technologies. For more on initiatives in Shetland and the Scottish Islands see Christiansen (2021).

The bigger picture

Traditional farming enterprises are cultural ecologies of particularity, subtlety, idiosyncrasy, and patina. Their modes of organisation and infrastructure are co-constituted with the places and the enterprises within them. This is what makes each distinctive. Industrial farming changes co-constitutional engagement with the land, aligning it more with intensively driven, externally derived, relational ways of working. At their worst, monocultures and infrastructures can be repetitious and monotonous, lacking human and ecological interest.

In recent years, there has been a growing reaction against industrialised farming, not just on ethical and environmental grounds, but also tied to arguments about quality of life. People increasingly want locally produced food associated with production processes that combine concerns for the environment and the welfare of animals with maintaining soil fertility through nutrient cycles that are internal to the system, and that do not depend on

applications of chemical fertilisers and pesticides. Regeneration looks for ways of facilitating people in recovering co-constitutional engagements that are 'nurturing' to the land and cultural ecologies.

Regeneration can happen only if people have greater involvement in decisions about the management and regulation of their local environment. The cultural ecologies of indigenous peoples depend on them taking responsibility for their actions and living within the means of Earth's affordances. In the industrialised world, we have moved towards centralised decision making and external regulation. This approach is now widely challenged, with more calls for devolution and localisation. There is a delicate relationship between locally adapted responsibility and action, and externally imposed regulation. Ultimately, this is about forms of governance.

Figure 8 shows a generalised model of the systems of governance that characterise liberal democracies. Although the population engage democratically with governance in the sense that they elect representatives, they have little influence over legislative processes which are largely derived from national and transnational socio-economic-political policies. It is a 'top-down' system. The axis of power is through the relational structures of centralised authority where policies are developed and applied (right hand circle). At the local level, the capacity of people to adapt policies to local conditions is very limited (reduced co-constitutional engagement in the left hand circle). The

Figure 8. A cultural ecological model of 'top-down' governance.
Diagram by Patrick Dillon.

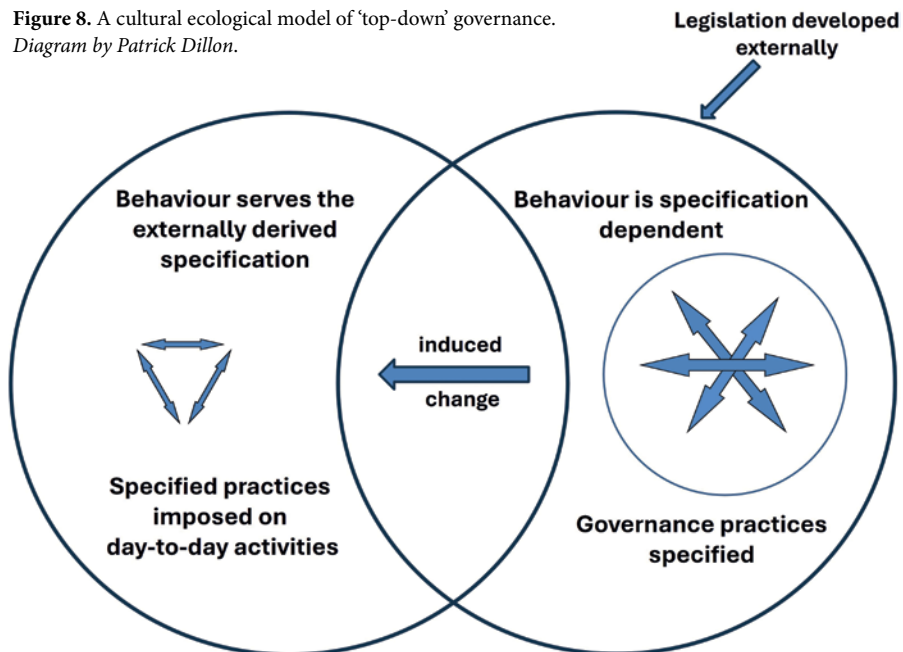


diagram is strikingly like the one for industrialised farming (figure 3) where maximising profits depends on aligning it with externally applied policies which favour big farms, high levels of mechanical labour, and external inputs.

The regeneration model has at its core revitalising local communities and economies so that people have more say in shaping their localities. It means giving credence to informal knowledge and skills that have local utility, and which can be accommodated in systems of governance. The general cultural ecological argument is given in Dillon, Bunikowski (2017). Out of this emerges the possibility of a modern form of ‘custom’. Custom is the unwritten, but widely agreed, codes of behaviour which coexist with statutory law. It is what Thompson calls ‘ambience’ and ‘*mentalité*’, habitual usages functioning within the routines of daily labour and common law. There are similarities with Bourdieu’s concept of habitus, a lived environment comprised of practices, inherited expectations, rules which both determine limits to usages and disclose possibilities, norms and sanctions both of law and neighbouring pressures, varying from place to place according to innumerable variables (Thompson 1991).

Such a model would reflect finely tuned co-constitutional and relational forms of engagement between the actions of people at the local level, and the statutory mechanisms that regulate the situations in which they live and work (figure 9). Policy making in the foreseeable future will remain largely centralised, but the vision is of working towards a system where certain of its elements are increasingly under local control.

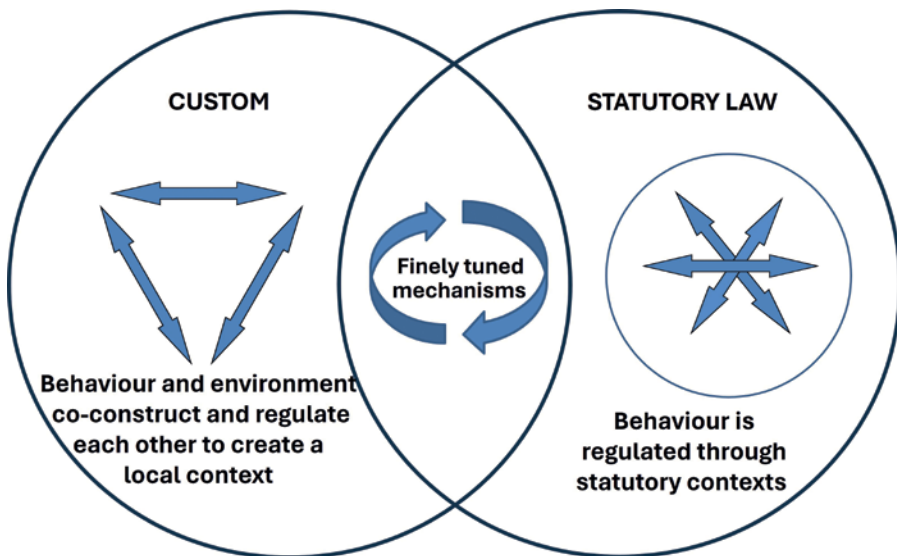


Figure 9. A cultural ecological model of adaptive localised governance. *Diagram by Patrick Dillon.*

Discussion

Widespread regeneration of circular economies is currently hindered by outdated conceptions of 'growth'. The growth metric is 'gross domestic product'. It is based on a mistaken assumption that Earth's resources are limitless if we manage them 'sustainably'. Earth is a closed system and its resources are finite. Ultimately we will exhaust them.

Linear resource-production-consumption chains have waste as an end-product. These chains contrast with their ecological equivalents which are cyclic and start with affordances, nature's forms of production. We should think in terms of what Earth can 'afford'. An 'affordance' is a planetary process of primary production or recycling, and thus of renewal. Primary production is the biomass made by living organisms, principally from simple inorganic molecules using light as its source of energy in processes such as photosynthesis. The processes of consumption by other organisms are also forms of production, because their 'waste' materials are consumed by something else, in other words they are recycled. Planetary recycling is the movement and transformation of materials between living organisms, the atmosphere, the oceans, and Earth's crust in processes of decomposition, erosion, transportation, and deposition. The processes are driven by solar, wind, hydro, tidal, geothermal, and metabolic energies. They renew the so called 'gifts of nature', like clean air and water, soils, and wildlife.

People convert affordances into stocks of materials which then become resources that can be transacted in buying and selling and other processes of exchange and the creation of infrastructure. To 'afford' something is to have enough money to pay for it, in other words, to be able to live within one's means. Can the environment renew its affordances to keep up with the rate at which humans turn them into resources and consume them? In practical terms this means working with primary production and planetary recycling, utilising sources of renewable energy, ensuring that regeneration is not compromised by consumption. Coal and oil, so called 'fossil fuels', are produced by very long term planetary processes, so burning them is not viable. These questions are at the heart of what it means to live sustainably. Living sustainably translates into living within the limitations of what the environment can afford.

Whereas all ecologies and cultural ecologies are in a state of flux, utilising affordances seldom leads to irreversible change in the environment, whereas resource use requires changing environment into infrastructure. The magnitude of the change from affordance to resource determines what is and is not sustainable. It is not just a matter of the progressive depletion of affordances, it is also the case that as the environment is converted to

infrastructure there is less of it to regenerate the affordances. As our understanding of these relationships has developed, the use of the term 'sustainability' has shifted subtly. One of its central tenets, on which there is now widespread agreement, is a belief in the need to avoid compromising the conditions under which future generations will live. Implied in this belief are ideals such as responsible use of what nature provides and maintaining an environment that affords diversity of life. It implies a rejection of making policy purely for short-term gain, and of the unacceptable exploitation of people and the environment. If something is to be 'sustainable' it must look to the future. There must be some thinking about the longer-term, and an effort to devise policy that is flexible enough to adjust and adapt, rather than to impose and stagnate. As a general argument this has widespread support, but as linkages between families and ancestral homes are broken, and individuals have less voice in the governance of the localities in which they live, it is difficult to translate the argument into localised action.

Bruno Latour (2018), French philosopher, argued that we should act collectively and cooperatively to find a new relationship with nature and the land if we are to address the impending challenges and upheavals. He had a vision of synergistic co-existence with nature, that is, nature transacting with society rather than being the canvas on which society operates. He calls this relationship 'terrestrial', derived from the French 'terroir', meaning the Earth we live on. It requires moving our perception away from the world as material resources that fuel systems of production, to one of shared agency where nature and society are in mutually transformative partnerships which 'engender' each other. Langlands (2017), resurrected the old Germanic word 'craeff' for making a living in such a world: a form of embodied power, knowledge, and ingenuity.

Mixed enterprise, 'organic' farming of the type that has been practiced through the ages, combining livestock with a variety of crops, where soil fertility is maintained by recycling within the system, is an engendering enterprise. Its viability is an exemplification of adaptability, of how methods are constantly revised through the introduction of new techniques, of how education has alerted people to what quality really means in food production, which, in turn, creates new markets for the products.

Cultural ecologies of circular economies are based on ecologically and culturally sensitive production and recycling of materials, integrated with renewal of local skills, knowledge, and expertise. In farming, these approaches and values are shared with the 'permaculture' movement, which promotes practices that reflect how ecosystems are maintained. Initiatives which blend fulfilling employment with responsible land management, are

no longer rarities. People are making lifestyle choices which recognise tradition because of its contribution to quality of life and a good environment. This is an engendering 'in my back yard' movement, a stark counterpoint to the 'not in my back yard' resistance to intrusive development.

If regeneration is to be a widespread and inclusive movement, it must have a set of broadly based aims with which people can identify, and upon which they can base practical actions. People are motivated to act about matters that affect their everyday behaviours, in other words things that are in their domestic and social environments and affect their wellbeing and financial means. This implies a need for degrees of regulatory flexibility and concomitant relationships between national and local governance that reconcile the interests of state and locality.

Regeneration is sustainability reformulated. The idea has its antecedence in E.F. Schumacher's *Small Is Beautiful: A Study of Economics as If People Mattered*. The book was published in 1973, at a time when the environmental movement was in its infancy. Schumacher's claim, that the industrial economy is unsustainable because it treats resources as income to be spent, has much in common with the cultural ecological arguments outlined here. The regenerative business model put forward in figure 7 is a growth model, but not one that is predicated on limitless resources. It incorporates the environmental and social benefits of working with the flows and cycles of nature, and the advantages of accessing global markets whilst maintaining locally-based production. The model is not without flaws, but it is a step towards moving our understanding of growth beyond the purely economic to include measures of human and environmental wellbeing.

Conclusion

Cultural ecology starts from the premise that everything is connected: nature-culture; environment-people; body-mind. On the one hand, this guards against excessive reductionism and simple cause and effect arguments. But in its quest for connection, cultural ecology soon runs up against wicked problems, where attempts to solve one part of the problem cause new difficulties elsewhere in the system. A middle way, between over simplification and unfathomable complexity, is to use cultural ecology as a theoretically-based framework which can be tested and refined in practice. Frameworks can be developed at different systemic levels, and used to reveal and map structures, relationships, connections, and material and information flows. Steward (1955), and the early proponents of cultural ecology, used it as a framework for interpreting the socio-economic dynamics of communities. I have moved the systemic level down a notch, to look at human agency through

the co-constitutional-relational lens. This enables behaviour to be modelled as a tension between emergence, and the affordances and constraints of the situation in which it is enacted, or put another way, the interplay between possibility and contingency.

In figure 1, I presented the basic model diagrammatically. The model was then adapted in figure 2 to represent generalised 'traditional' farming. This is farming which is contingent on the affordances and constraints of the environment (location dependency) and the application of local skills and expertise in husbandry and cultivation (craft practice). The model is historically grounded. In pre-modern farming, craft practice was an outcome of the need to apply human labour in the utilisation of the available tools and technology in the maintenance of an environment to produce food, shelter and other necessities of living. The activities of the people who worked the land, who provided the labour, were co-constituted with these affordances and constraints. Beyond that, they had little say in the way the land was used, given the forms of social stratification, ownership, and power structures of the times.

Cultural ecologies of the past cannot be recreated in the present. We can only generate conditions conducive to the emergence of forms of land-use which bring benefits to craft practice and biodiversity. These practices must operate within the affordances and constraints of the cultural ecologies of today. For example, through targeted subsidies in farming, and in resourcing 'heritage' projects and providing services in the leisure and education sectors. This is why current regenerative initiatives can be little more than niche interests given the global economic paradigm. Actions to improve quality of life and environment are largely undertaken by people who have the financial means to make choices. They are luxuries to most people who do not have the economic flexibility to broaden their sphere of engagement and responsibility.

The cultural ecological modelling presented here does provide some indication of the way policy might develop. It has revealed the similarities in how both industrial farming and 'top-down' systems of governance direct forms of behaviour to conform with imposed specifications. They constrain the types of co-constitutional engagement with people working the land that are conducive to the emergence of innovation at ground level. A short-coming of the modelling is that it has not addressed how power and choice operate through institutional structures, land ownership, and wide differences in levels of income. Moreover, the arguments in this article have been about regenerating living in the land. They do not touch on regenerating life in cities, where most of the future population will live and work, and for which new thinking is

required. Through necessity this will mean developing ‘smart’ circular economies of crop production, driven by renewable energy and integrated into the fabric of city infrastructures. These initiatives must be accommodated within shifting spatial relationships between rural and urban environments as the climate changes. Finding ethical and equitable systems of governance that reconcile these different ways of living is a pressing challenge.

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Patrick Dillon. Photo by Priscilla Trenchard.

Ringmajandus ja taastav lähenemine maale, käsitööle ning liigilisele mitmekesisusele. Sidususe kultuuriökoloogia

Resümee

Ringmajanduse idee kohaselt annavad isemajandavad ettevõtted tööd kohalikele elanikele, tootes kaupu ja teenuseid paikkondlikest ressursidest, vähendades seega jäätmete teket ja maksimeerides ettevõtte sisest taaskäitlemist. Talupidamine Põhja- ja Lääne-Euroopas on ajalooliselt töötanud ringmajanduse põhimõttel ning selle lahutamatuks osaks oli käsitöö tegemine. Tänapäeval kutsume sellistel printsiipidel põhinevat põlluharimist „traditsiooniliseks“ põllumajanduseks, mis lähiminevikus on paljuski asendatud tööstuslike süsteemidega. Põllud on üldiselt monokultuursed, põllunduseks vajalik tuleb väljastpoolt talu ja nii toodang kui ka jääkained väljuvad ringlusest. Väetiste ja taimekaitsevahendite koostises olevad kemikaalid kahjustavad keskkonda. Põlvkondi kasutust leidnud käsitööoskused muutuvad tarbetuks.

Siinses artiklis on lähenemisena kasutatud kultuuriökoloogiat, mis võimaldab teoreetiliselt põhjendatud ja praktikas kontrollitud käitumispõhist lähenemist, uurimaks inimeste seotust ja käitumist seoses nende poolt haritava maaga. Kultuuriökoloogiliste mudelite abil näitlikustatakse, kuidas traditsioonilisi põlluharimismeetodeid saaks tänapäeval kasutada kui majanduslikult elujõulisi alternatiive tööstuslikule põlluharimisele. Seoses muutuvate keskkonna ja elustiili küsimustega nagu orgaaniline põllumajandus, loomade heaolu, kohalik toit, jätkusuutlik moetööstus ja pärimuslik käsitöö, on esile kerkimas järjest enam ringmajandusel põhinevaid ärimudelid. Teistsugused arengud on seotud teenustega, mis rahuldavad kasvavat nõudlust vaba aja veetmise, hariduslike ja pärandikogemuste järele. Digitaalsed tehnoloogiad ja sotsiaalmeedia globaliseerivad potentsiaalset turgu uute toodete jaoks, samas kui ringmajanduslikud süsteemid on loodud, arvestades kindla kogukonnaga. Viimane toob kogukondadele kasu nii kultuuriliselt kui ka ökoloogiliselt, panustades bioloogilisse mitmekesisusse ja inimeste ning loomade heaolusse, vähendades tööstusliku põllumajandusega seotud kahjustavaid välismõjusid. Soodustatakse ka traditsioonilise käsitöö taaselustamist ja edendatakse vaimset pärandit.

Taastava lähenemise eelduseks on inimeste suurem kaasatus otsustesse, mis puudutavad nende kohaliku keskkonna haldamist ja sellekohaseid

regulatsioone. Artikkel teeb ettepaneku, kuidas ühendada kohalikult välja kujunenud kombeid seadusjärgsete valitsemissüsteemidega, mis soodustaks omaks võetud kultuuriökoloogilist juhtimist, peegeldades looduse ja kultuuri sünergilist koeksisteerimist.

Võtmesõnad: ringmajandus, käsitööoskused, taastav lähenemine, kultuuriökoloogia