

Towards an Expanded Notion of Skills Ecosystems

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Introduction

In [Chapter 1](#), we introduced the notion of a social ecosystem for skills model and previewed its importance to our approach in this book. In this chapter, we build on that introduction by documenting the evolution of skills ecosystem research and outlining where we are trying to take it forward by expanding the approach. Although our cases are African, our expansion of the model has global salience. We argue that our approach makes a contribution to the wider project of transforming VET for a transformed economy, society and environment.

We begin by tracing the emergence of skills ecosystems within the Anglophone north. In particular, we draw on the version of the approach developed by [Hodgson and Spours \(2016, 2018; see also Spours, 2019\)](#). Their research promotes a more socially oriented application of the skills ecosystems work in diverse contexts more applicable to the African settings for vocational education within which our cases reside. Crucially, they adopt a perspective that connects working, living and learning and enables a more place-based orientation that can also support skills for inclusive sustainable development and regional economies.

We then illustrate how we applied the core elements of the social ecosystem model to the four cases, enabling us to develop a more nuanced and textured understanding of local vocational skill formation. Through this analytical work, we lay the foundation for the theoretical expansion of the notion of skills ecosystems in the final section of the chapter. There we draw on critical realism to help us shape a conceptual and theoretical framework that does not succumb to reductionist conceptualizations of vocational skill formation. In

attempting an expanded view, we explore the potential of conceptualizing skills ecosystems as a complex phenomenon that can be resolved into their separate yet related and emergent components so as to identify and relate the various mechanisms as different levels of reality that enable and constrain local skills ecosystems. We developed an expanded model that saw these interactions in a multiscalar, spatiotemporal way.

This expanded notion of skills ecosystems then lays the foundation for the empirical chapters that follow, which explore (i) formal and informal vocational education and training (VET) and the informal economy; (ii) the practice of VET teaching; (iii) transitioning between work and learning, between different disciplines of knowledge and between different levels of learning and levels of practice; and (iv) networking and community engagement in support of inclusive sustainable development and the particular role of universities as mediation partners in promoting this.

Skills ‘ecosystems’: a construct in transition

Although the skills ecosystem notion is conventionally dated to [Finegold’s 1999](#) paper, it also draws on his earlier work beginning in the late 1980s. This early work (most notably [Finegold and Soskice, 1988](#)) was focused on the national system level and on the UK in particular. Finegold and Soskice argued that the economy needed to break out of a low-skill equilibrium: a status quo of poorly trained workers and managers amid a self-reinforcing network of societal and institutional interactions that stifled demand for skills improvement. They described the UK as becoming increasingly isolated from more advanced industrialized economies that had far higher levels of general education and training. Their analysis viewed the problem as rooted in deeper systemic issues of supply and demand for skills, rather than just inadequate education and training. They theorized that part of the solution to this challenge lay in ‘coordination’ between multiple actors in what they viewed as an intrinsically competitive environment, but they did not use the term ‘ecosystem’. Their work was quickly picked up as relevant to the South African context ([Kraak, 1993](#); [McGrath, 1996](#); [McGrath et al, 2004](#)).

A decade later, Finegold’s focus had moved to the regional level ([Finegold, 1999](#)). Here, he echoed other traditions going back to [Marshall’s \(1890\)](#) work on industrial districts, which argued that economic activities are embedded in social processes that enable certain regions to create and sustain successful clusters (see also the innovation systems tradition, which has also made a spatial leap from the national to the regional: see, for instance, [Lund and Karlsen, 2020](#)). Finegold took the case of Silicon Valley and explored how its high-skills ecosystem might inform the UK case. While he stood by his previous overall analysis of Britain’s low-skill equilibrium,

he noted that this was an oversimplification of reality as high-skill regions and sectors could exist within low-skill economies. He argued that while both ‘equilibrium’ and ‘ecosystem’ captured the interdependence of actors within a system, the latter term was preferable as it focused on continual evolution in a self-sustaining high-skill ecosystem. Drawing on natural ecosystems, he suggested that four requirements were necessary to create and sustain a high-skill ecosystem:

- a catalyst (or set of catalysts) to trigger their development;
- nourishment to sustain growth on an ongoing basis;
- a supportive host environment; and
- a high degree of interdependence among actors in the system (Finegold, 1999: 66–71).

The ecosystem metaphor has proved attractive to academics and is increasingly used by policymakers. A related version is that of the entrepreneurial ecosystem. Isenberg (2010) again took the example of Silicon Valley but argued that its success was hugely context-dependent and could not usefully be replicated. Instead, he suggested that entrepreneurship could be nurtured where interventions built on the existing context of the specific place. He identified six elements to this: a conducive culture, enabling policies and leadership, availability of appropriate finance, quality human capital, venture-friendly markets for products, and a range of institutional supports, all of which are always context-specific. These are understood through the ‘metaphorical device’ of natural ecosystems to retrospectively reflect on the dynamics of tech/financial clustering and rate of ‘spin offs’ (ecosystem effect) to develop more high-growth firms (Spours, 2021a). While not conceptualized as skills ecosystems, the industrial ecology literature on localized circular economies (Baas, 1998; Yu et al, 2014) also includes issues of system leadership, communication and partnership building, information sharing and transparency, and trust building. In South Africa, the early interest in low-skills equilibria was also followed by a sectoral turn (for instance, Kraak, 2009; McGrath, 2015; Wedekind and Mutereko, 2016; Wedekind, 2019).

The strongest empirical exploration of the notion of skills ecosystems comes from Australia. There, a series of more than 100 pilot projects involved industry associations, enterprise and workplace managers, VET providers, industry skills councils and education authorities. In that context, Buchanan et al (2001: 21) defined a skill ecosystem as ‘clusters of high-, intermediate- and low-level competencies in a particular region or industry shaped by interlocking networks of firms, markets and institutions’. They argued that VET policy in Australia also needed to address wider economic development, labour market and employee

relations and suggested that ‘skill ecosystems’ could tackle Australia’s skills challenge. The Australian pilots suggest that effective skill ecosystems require leaders with deep knowledge of their domain and analytical and organizational skills. However, they also illustrate that building social coalitions to support skill ecosystem reform is difficult and time consuming, requiring partnerships and trust.

These early iterations of the ecosystem concept pointed to the complex reality of multiple actors interacting within a skills system in a regional context. Despite the expansion of the skills ecosystem work, it faces several core challenges as a model for VET and skills development more broadly. First, critics have argued that a skills ecosystem is constrained by a neoliberal growth model characterized by the absence of strong trade unions, well-regulated labour markets, active industrial policy and robust welfare state arrangements (Payne, 2008). Second, while the focus on context is important and skills in context has intuitive appeal, it is challenging to clarify what in a particular context is problematic. It is thus important to keep the idea that that context is not neutral or self-evident. Analysis and reform in skills analysis needs to acknowledge that most problems arise from the ways that skills in demand are defined, used and developed and have their roots in the nature of work concerned (Buchanan et al, 2017). Third, new knowledge has tended to emerge from applied policy-based research, rather than more fundamental research. Thus, the tradition has been rather weak in its theoretical development (Hall and Lansbury, 2006; Payne, 2008; Anderson and Warhurst, 2012). In the sections that follow, we first expand on Spours and colleagues’ conceptualization of a social ecosystem for skills model and then explore our approach to it in an attempt to strengthen its theoretical and empirical basis.

The importance of social ecosystems for skills

The preceding chapters illustrate that the issues facing global societies are increasingly seen as complex, multifaceted and integral to social, ecological and economic development. Thus, as societies grapple with the rapid and catastrophic effects of the polycrisis, occupational and educational systems have attempted to meaningfully comprehend the implications. Within Africa, these challenges are especially complex. In a continent facing fundamental transformation on every front, there are significant new challenges for work and learning systems. Lotz-Sisitka (2009: 169) explains that ‘change orientated learning and research needs to be located at the interface of local and global as well as past, present and future, creating not only a challenging epistemological frame but also a challenging temporal and spatial frame for such research’. Therefore, understanding local skill formation in these changing times raises interesting challenges.

Drawing on a critique of the entrepreneurial ecosystem and skills ecosystem approaches, Spours and his colleagues developed an alternative ecosystem framework that helped them explore the ‘relationship between disruptive economic and technological developments and how they affect local economies, jobs, the shape of urban environments and the living conditions of their populations’ (Spours, 2019: 3) with a particular focus on London. Whereas the primary focus of the elite ecosystem was the firm, the primary focus in the social ecosystem is ‘local place’ as the focal point of economic, civic and educational participation. This shaped a skills ecosystem model that depicts a dynamic, multilevel relationship of temporal and spatial factors as central to skills development.

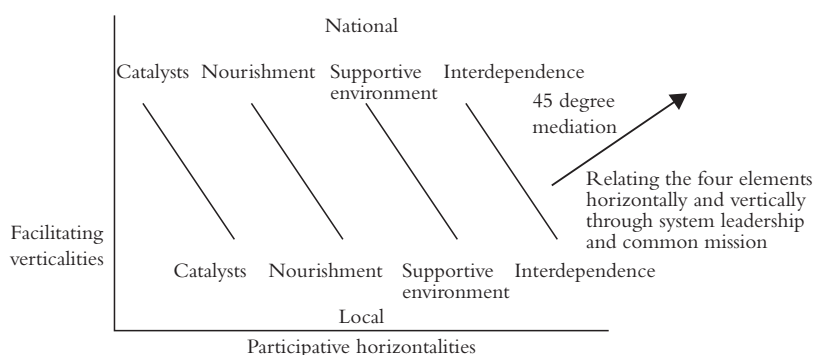
The social ecosystem for skills model thus offers a useful approach to skill formation research as it seeks to develop skills development approaches that forge stronger connections between working, living and learning, mirroring the best elements of the precolonial skills formation system and the most admired modern systems. It has the potential to learn also from emerging systems seeking to enable inclusive sustainable development, circular economy, industrial ecology orientations that prioritize regional circulation of materialities, and ‘the development of a collective knowledge and the development of the collective through knowledge’ (Cerceanu et al, 2012: 623; see also Habiyaemye et al, 2020).

Spours and colleagues’ work on ecosystems uses Finegold’s four core elements but attempts to relate these elements both horizontally and vertically through system leadership and common mission. In Figure 4.1, Spours uses Finegold’s core elements of ecosystems to illustrate the relationship between horizontal and vertical factors and connects macro and meso elements of ecosystems. Crucially, it emphasizes the social dimension of this, defining a social ecosystem for skills formation as an ‘evolving, place-based social formation that connects the worlds of working, living and learning with the purpose of nurturing inclusive, sustainable economic, social and educational development in diverse communities, localities and sub-regions’ (Spours, 2021a: no pagination).

Spours’ social ecosystem for skills is conceptualized as comprising four related dimensions:

- collaborative horizontalities;
- facilitating verticalities;
- 45° politics and mediation through common mission and skills ecosystem leadership; and
- the concept of ecological time that allows for processes of holistic and deliberative system evolution (Spours, 2021a).

The following discussion expands on these four elements.

Figure 4.1: Combining the Finegold and Spours models

Source: Adapted from Spours (2021a)

Collaborative horizontalities

Extended and participatory horizontal terrains are a fundamental feature of the social ecosystem model, seen as education networks, local anchor institutions and a range of social partners/communities supported by the connective role of digital technologies (though the latter seems highly contextual). The horizontal dimension is understood to be dynamic and multilayered, with spatial characteristics linked to localities, regions and subregions. The idea of ‘nested’ relationships also opens up a way of explaining how a broad social ecosystem might contain different types of embedded subsystems, such as elite finance and technologically based ecosystems and skills ecosystems involving workplaces. Therefore, Spours argues that the horizontal terrain is layered, interlocking and ultimately collaborative and provides the key elements of ‘interdependent relations’ and ‘nourishment’ that sustain ecosystems. The flourishing of the social ecosystem for skills model requires this network-building to progress to institution-building so that it has strong inclusive anchor institutions.

Facilitating verticalities

The emergent social ecosystem for skills model envisages an extended state role – both an enabling national state and an empowered local state – through what is referred to as ‘facilitating verticalities’. The verticalities play important roles in sustaining ecosystems as ‘catalysts’ and in providing the ‘supportive environment’, including financial boosts, key infrastructure projects and regulatory regimes.

45° politics and mediation

A common mission and ecosystem leadership is needed between the vertical and the horizontal. Spours argues that since these ecosystems are not naturally

formed within current economic and political conditions, they require nurturing processes to come into existence and thrive. He explains that this dimension thus embodies ‘the role of mediation and connectivity, including the concepts of ecosystem leadership, formative educational activity and socially-designed technological connectivity’ (Spours, 2021b: no pagination). In this view, common mission is related, in particular, to the needs of the locality and is concerned with providing the ‘glue’ between a diverse set of social partners, each with their own specialisms and preoccupations. The common mission is exercised through what might be termed ‘ecosystem leadership’, the key function of which is to nurture, cohere and educate the different elements or forces of an expanded social ecosystem by relating its horizontal and vertical features. Seen in terms of ‘system leadership’, Spours draws on Senge et al to highlight three core capacities: ‘the ability to see the larger system’, ‘fostering reflection and more generative conversations’ and ‘shifting the collective focus from reactive problem-solving to co-creating the future’ (Senge et al, 2015: 3–4). In Spours’ diagrammatic presentation of this concept, he draws mediation as a 45° line between the horizontal and vertical, drawing on Lawson’s (2019) work for an English thinktank that uses the notion of a 45° politics. We do not draw on this aspect of Spours’ terminology but simply note his language of the 45°.

Ecological time

The final element is ecosystem construction and evolution over ‘ecological time’ that allows for processes of holistic and deliberative system evolution. This dimension helps us reflect on how change occurs in systems over long periods of time. Such a reflection emphasizes that social ecosystems are not time-bound. Spours argues that the social ecosystem for skills model should be considered as a long-term project in which continued effort is required to ‘understand the configuration of forces needed for the flourishing of such a system and the nurturing of complex relationships over time’ (Spours, 2021b: no pagination). Hodgson and Spours (2018) explain that this includes ‘the identification and mapping of existing relations and challenges to formulate the common mission, building networked sets of activities to develop new forms of collaborative activity’. These would then create the demand for new types of skills, thus creating a social ecosystem effect.

These elements help us to understand ecosystem change as the interplay of developments at different analytical levels, which interact dynamically in the unfolding skills ecosystem.

Applying a social ecosystems perspective

The VET Africa 4.0 project was premised upon an understanding that VET systems are not functioning effectively and that new approaches are required

(see earlier chapters and [McGrath et al, 2020](#)). The four cases are situated within a wider systemic perspective and the political economies shaping state-led formal national VET systems that we deem to be largely ineffective. Yet, each of the four cases are also unique locations, chosen to reflect a rural–urban spectrum, with different degrees of economic formality and development trajectories. Within VET Africa 4.0, we required a conceptual and theoretical framework that could capture issues of relationality, in terms of VET networks and connections between individuals and institutions within the geographic bounding of each case and help us to understand how such relationships are hindered or facilitated by regulations, policies and key local actors and institutions. The social ecosystem for skills model encapsulates much of our thinking about the necessity of going beyond productivist notions of skills for work and the economy to thinking more sustainably and holistically about reimagining the purpose and functionings of VET towards just transitions in diverse African contexts.

In the data narratives presented here, we explain how we used and interpreted the social ecosystem dimensions of verticalities, horizontalities and mediation to understand and analyse the skills ecosystem within each of the four cases and guide our cross-case analysis. This process drew upon our prior work synthesizing insights from VET literature for the VET Africa 4.0 project (see also [McGrath et al, 2020](#)) and a case-mapping exercise where we developed social ecosystem case maps, drawing on desktop research and contextual work on each case setting. We also drew upon our insights as individual researchers, practitioners and activists in the field and our position as the VET Africa 4.0 Collective. This elucidation involved physically drawing each case ecosystem. Overall, this process expanded our critique of the social ecosystem for skills model in terms of what is necessary for theorizing VET ecosystems in diverse African contexts and led to our expanded notion of skills ecosystems, which we present in the final part of this chapter. For now, we turn to its main elements and how we began to conceptualize these across the four cases and the project more broadly.

‘Facilitating verticalities’ in African VET ecosystems?

Across the four cases, we began by framing ‘facilitating verticalities’ as ranging from the international, through to the national and the local. International policies and development frameworks on VET and skills development can be important influencing factors nationally and locally. For example, the policy orthodoxy of VET 3.0 (see [Chapter 2](#)) shapes the funding priorities and development narratives of donors and other external actors (for instance, INGOs) operating within the cases. Equally, all the cases are located within globalized economic trends. The way that food, transport, water and oil is

experienced in the cases is shaped in important ways beyond the nation (see [Chapters 3 and 5–8](#)). Nonetheless, national actors are central to the concept of facilitating verticalities, where it is necessary to understand how state actors, such as regulatory bodies and education and training departments, send signals vertically into the VET ecosystem. These signals are intended to be facilitating verticalities for the local dimension. This local dimension is where the cases sit as place-based locations of VET and the corresponding patterns of living, working and learning.

It was necessary to understand the extent to which vertical policies, systems and investments and hierarchical structures are facilitative of local VET and skills development in each case. We were clear that the possibility for facilitating verticalities existed within and across the international, national and local dimensions of each case. Though we recognized that this consisted of those mechanisms and processes that we could conceive of and empirically seek to understand, from a critical realist perspective, we were aware that the ‘real’ is far more complex than our knowledge of it. This challenge applies across the entire notion of a VET ecosystem, and we return to this issue in the final section of this chapter.

Unpacking the vertical: South African cases

In South Africa, concepts of a developmental state and infrastructure-led growth are at the heart of government policy initiatives and decision making. The National Development Plan has an explicit focus on large-scale infrastructure projects, and this is central to the eThekweni case, as we noted in [Chapter 1](#).

On the vertical axis, it was intended that the ‘visible hand’ of the state would ensure that such projects were designed, developed and operated in a manner that secured them as engines of economic transformation, for example by tackling economic disparities in business opportunities and promoting skills access and employment. In the first case, in eThekweni, Strategic Integrated Projects (SIPs) were supposed to be supported by skills investments coordinated from a senior level in the national Department of Higher Education and Training (DHET). Regionally, various state departments were supposed to facilitate the implementation of these policies in the regional ecosystem in partnership with provincial and municipal structures, again as outlined in [Chapter 1](#). However, we were conscious of the stagnation of policy since the actors we had engaged with up to that point attributed none of their activities to the influence of any of these state-led development initiatives. Ideologically, we also saw human capital theory having an immense influence on the activities of the various actors, based on the idea that education is an investment in human capital that will yield dividends in the form of improved livelihoods.

In the second South African case, actors were frustrated by inadequacies in the land reform programme that failed to provide water to farmers who had been given back their land in a context that faces extreme issues of drought and climate change, as outlined in [Chapters 1 and 3](#). We noted in [Chapter 1](#) the range of state agencies that constitute the key actors on the vertical axis. In contrast to the focus on industrial policies in the eThekwin case, the vertical dimension in the Alice case is dominated by policies related to natural resources and community development, including those oriented towards issues specific to the agricultural sector in the National Development Plan. Whereas provincial and metropolitan policymakers are important elements of the vertical in eThekwin, policy is perceived in Alice as largely coming from the distant national level. Moreover, the vertical is shaped by the overwhelming focus on and influence of corporate (and often globalized) control of food and agricultural systems that continues colonial and apartheid processes of deliberate marginalization of small-scale commercial agriculture, as outlined in [Chapters 2 and 3](#). In terms of VET actors on the vertical axis, there are three issues. First, the mainstream public VET system under DHET is essentially urban-focused and industry-oriented, with rural colleges, such as the one in Alice, largely expected to offer programmes that are misaligned to the full scope of local labour markets. Second, the gap between what are effectively two agricultural systems is manifested in a disconnect between a high skills ecosystem and local public VET institutions and agricultural colleges. Third, these different departmental jurisdictions on the vertical axis are reflected in a disconnection on the horizontal axis between the different public vocational providers, located as they are under different policy and quality assurance regimes. Such vertical dynamics could play a critical role in hindering the types of facilitative VET learning and skills development processes that are essential to rural issues such as those faced in the Alice case.

Unpacking the vertical: Ugandan cases

As outlined already, political economy issues – both colonial and postcolonial – in Uganda have contributed both to inadequate skills and livelihood opportunities and persistent negative attitudes to VET and certain skills and livelihoods. Paradoxically, VET is seen both as a current problem and potential solution to broader development challenges. On the vertical axis, this has policy implications for both Ugandan cases. We have already noted the waves of donor-supported skills policy initiatives and have identified these as very much aligned with VET Africa 3.0, despite the longstanding critiques thereof (see [Chapter 2](#)).

In both cases, local government is supposed to provide oversight and leadership of VET implementation, but this functionality is limited due to factors such as inadequate funds, policy silos and personnel shortages.

In mapping both cases, it was evident that they were geographically and structurally disconnected from political and economic power on the vertical axis. In addition, there are also distinctive features in each case that influence VET policy and provision at the local level, reflecting the dynamics of postconflict and oil extraction imperatives, as summarized in [Chapter 1](#). In Hoima, this has resulted in the Ministry of Energy and Mineral Development being a major player. Here, the vertical axis is also heavily influenced by the oil sector, its global dynamics, major firms and environmental contestations. However, in terms of VET, the core issue is the impetus that the oil industry has had on shifting policy attention on skills development in the region and the subsequent influx of vocationally related activities and programmes by various international actors on the horizontal dimension. For Gulu, the inflow of major humanitarian aid in response to the conflict still influences the vertical dimension, somewhat muting the human capital discourse.

Top-down verticalities

These first attempts to describe the vertical axis for each case and conceptualize possibilities for facilitating verticalities led us to question who is (and is not) involved in VET and skills planning, when top-down, nationally driven VET strategies appeared to be central to each case. Processes of dissemination and application of VET policy and skills development at the local level were either difficult to visualize or appeared to be primarily top-down in nature. With regard to the possibility of facilitating verticalities that support living, working and learning, it was clear that relevant policy and strategy intent existed in all four cases. However, we recognized that it was also necessary to question how these top-down policies, actors and associated resources could adequately respond to the occupational and skills training mismatch that exists within the cases, not least the levels of employment within the formal sector. This also links to issues of equality, particularly for those individuals outside of formal VET, skills and occupational systems. These insights led to a distinct set of questions about the vertical axis in the social ecosystem model for skills. We opted to include these questions as they offer potential methodological guidance for future work and help to illustrate what might be necessary to facilitate integration among the various policy actors in the dynamic and complex VET contexts represented by our cases:

1. What are the relevant international, national and local policies that have a bearing on the case?
2. What hierarchical governance structures – for instance, government, institutional boards, district level boards and policies (nationally and locally, and internationally) exist – and how might they constitute facilitating verticalities in diverse VET contexts?

3. What are the issues/differences vis-à-vis policy intent and local implementation? What space is there for local VET actors to have agency and be involved in vertical structures? What capacity is there to contribute and have influence (for instance, on policy design)?
4. What is missing on the vertical dimension? For instance, if the local government is missing or appears ineffective, why? How is this compensated for? What/who is included and excluded on the vertical axis? How do issues of segmentation manifest? For instance, are labour markets and learning systems segmented, do certain groups get stuck in lower-status elements of the VET system?

Identifying ‘collaborative horizontalities’ in complex dynamic multilayered VET contexts

We applied the notion of collaborative horizontalities to the cases to understand the complex, dynamic and multilayered nature of VET-based relationships within each. For this dimension, we sought to understand what key actors and relationships existed on the horizontal terrain. Specifically, we addressed the nature of relationships that may sit within and across various clusters and nested relationships associated with each case. In terms of the core notion of collaborative horizontalities, it was critical to understand what collaborative engagement within each case looked like over time, and which actors appeared to have a mandate to bring actors together on the horizontal dimension collaboratively.

On the horizontal dimension, the eThekweni skills ecosystem consists of a range of public, private and in-house training institutions (the latter both public and private), partially nested in the national skills system, providing a differentiated institutional context, as summarized in [Chapter 1](#). Many of these organizations in turn interact with the public skills policy architecture through DHET and sector education and training authorities. It was evident at the outset that there was a hierarchy of these institutions regarding status within and engagement with the maritime sector, with public VET institutions appearing largely marginal. Indeed, DHET’s vertical commitment to linking SIPs and the skills system appeared to dissipate once it moved beyond the walls of the department. However, there were also early signs that one industry body, the eThekweni Maritime Cluster, could play a role in building relationships and facilitating collaboration, though VET was not a priority area therein. As we noted in [Chapter 1](#) (and will return to in more detail in [Chapters 6 and 7](#)), a potentially important new intervention at the regional level was the new uMfolozi Maritime Academy in Richards Bay.

In the Alice case, the actors populating the horizontal axis are farmers, local nongovernmental organizations, local economic development

officers, extension services, youth groups and community representatives. There are also several students and faculty at local education training institutions. The connections between these actors tend to be contextual and, for the smallholder farmers who are at the centre of the case study, very localized. Despite featuring prominently in the region's history and current demography, small-scale farmers are not at the centre of the VET or agricultural colleges' curricula, nor those of the agricultural faculties of the local universities. As noted earlier, the current formal agricultural education system is mostly geared towards training larger-scale commercial farmers and extension workers. These extension workers, it is intended, will then go on to provide training and support to the much larger pool of small-scale and subsistence farmers in the area. However, historically, due to a bifurcated policy system, universities and agricultural colleges were set up to exist closer to the vertical axis than the horizontal one, reflected in an agricultural expert system that is still not responsive to the needs of farmers on the ground, despite progressive policy. Indeed, in many villages, large disconnects exist between small farmers and the extension services. Political mismanagement and corruption have further complicated issues, leading to breakdowns in trust and a wide divide between actors on the horizontal axis and the verticalities described earlier.

Against this backdrop, it was believed that a multistakeholder learning network, the Imvothu Bubomi Learning Network (IBLN), could provide a model for pro-poor, community-owned approaches to connecting living. This was facilitated by collaborating anchor institutions in the form of the Fort Cox Agriculture and Forestry Agricultural College (FCAFTI) and Rhodes University working with the University of Fort Hare (that is, a cluster of vocational and higher education institutions), with support from the municipality's local economic development office. This provides a model for pro-poor, community-owned approaches to connecting living, working and learning (see [Chapters 5 and 8](#)). This learning network has illustrated how such collaborations could improve VET offerings, mediate learning and support inclusive, community-driven skills for a just transition (see [Lotz-Sisitka et al, 2021](#)).

In Uganda, the Gulu case also faces a series of development challenges as outlined in [Chapter 1](#). In response, various key actors in the area are seeking to work with young people to transform livelihoods so that they are more just, decent and sustainable. NGOs, both local and national, also play major roles in facilitating vocational skills for development, primarily due to the influence on programmes as determined by strategic funding priorities. They function across various categories with a predominant focus on youth and women. Amid this array of development-oriented actors sit various VET institutions (formal, nonformal and informal), and parents, students, teachers, employers and workers/employees. All of whom are primary local

stakeholders on the horizontal terrain. Secondly, Gulu University and Ker Kwaro Acholi (the traditional authority) exist as central community-based resource centres because they connect networks in VET and livelihood opportunities. Finally, there are various youth groups, local communities, traditional institutions, women's groups and cooperatives, who are all central to local initiatives to strengthen VET provision and promote livelihood opportunities (see [Chapters 5 and 8](#)).

Finally, in the Hoima case, the discovery of oil in Uganda is linked to a core narrative that oil will contribute to local development through jobs, increased incomes and infrastructure development in the area (see [Chapter 3](#)'s discussion of African post-independence reliance on extractives). As outlined in [Chapter 1](#), there have been two main skills interventions in the region, the Uganda Petroleum Institute, Kigumba (UPIK) centre of sectoral excellence and the Skills for Oil and Gas in Africa (SOGA) programme. Alongside these are various public and private formal, informal and nonformal VET institutions, all of whom have various training programmes for learners, many of which are not relevant to the oil and gas industry. Similarly, few have the technical capacity, resources or equipment to support anything more than basic skills in subjects such as hairdressing, motor mechanics, carpentry or welding. As with the Gulu case, attached to this ecosystem of VET institutions are important stakeholders including students, VET graduates and parents. Alongside these are growing numbers of local businesses such as transport, hotel, tour companies, land and estate agencies, all of whom represent potential linkages between VET and skills supply and demand either directly or indirectly related to the oil and gas industry. The extent to which this mix of donors, VET managers and teachers, learners and private sector actors (local, informal and those linked to oil and gas) are interacting in ways that resembled collaborative horizontalities for the advancement of local skills remains unclear. Nonetheless, the Hoima case raises the interesting question of whether oil and gas can be a disruption to the current VET model and a catalyst for livelihood changes through a new development paradigm for the region, generated through collaborative horizontalities.

Possibilities for collaborative horizontalities

The horizontal axis pointed towards the possibility for bottom-up, devolved, collaborative elements of governance and leadership within each case. However, this primarily consisted of a theoretical but unrealized potential in most cases, with the notable exception being the learning network example in the Alice case. These preliminary insights on the possibilities and challenges of collaborative horizontalities in diverse and complex VET ecosystems

led to the following questions about the application of the collaborative horizontalities concept to VET in Africa:

1. Who are the key actors on the supply side? This may often include VET institutions in multiple guises: formal, nonformal, informal, public, private, religious, alongside NGOs, INGOs and any other actors who are putting skills into the system.
2. What are the key relationships between actors on the horizontal axis, and what are the nature of these relationships?
3. What is the relative status, authority, resourcing and resource flows of the various actors?
4. How is VET-based knowledge and learning transferred within these relationships? Where do people and institutions get their knowledge? How do VET providers learn about what skills they should be providing? Where else are people learning?
5. What, if anything, might be causing a change in people's understanding about VET, and living, working and learning?
6. What/who is missing on the horizontal dimension?
7. What would it take to catalyse more horizontal collaboration? What is blocking or hindering it?

VET learning systems and practices (evidence of mediation)

The third element of the social ecosystem for skills model is the concept of mediation between connecting horizontalities and facilitating verticalities. The process of mediation involves key social actors who 'think and move along horizontal and vertical terrains to arrange exchange and collaborations, to mediate the effects of national and regional government and to use global digital systems to support horizontal collaborative working' (Grainger and Spours, 2018: 6). We used this concept to explicitly think about crosscutting issues of working, living and learning at the intersection of the vertical and horizontal dimensions within the cases, and to explore the possible mediating processes that support a common vision of VET learning systems and practice. Grainger and Spours (2018) talk of mediating forms of leadership that function within vertically organized states and can identify a shared public mission or narrative, as opposed to the narrow objectives related to private wealth production in elite ecosystems. In our case contexts, we questioned what and who has the ability – and corresponding resources and mandate – to bring together processes and key institutions on the vertical terrain with a wide range of actors on the horizontal terrain in collaborations and continuous processes that support working, living and learning. For example, could, or should, community networks and local anchor institutions (for instance, VET institutions

and universities) function as mediators? In the Alice case, the focus was less on ‘who can mediate’ and more on what mediation processes can be collectively developed, which included:

1. contextual analysis and reflection on the need state;
2. training-of-trainers’ programmes to introduce new knowledge and options;
3. codevelopment of productive demonstrations as sites of colearning and mutual beneficiation;
4. curriculum innovation; and
5. use of social media communication tools including community radio (see [Pesanayi, 2019a](#); [Lotz-Sisitka and Pesanayi, 2020](#)).

This culminated in three overarching questions for case analysis regarding the mediation dimension, and where this might be evident in the four cases:

1. Are there aspects of common vision, mediation and leadership evident within the cases?
2. If so, what type of catalytic actors (institutions, individuals, organizations, others; or configurations of actors) lead and/or facilitate VET ecosystem connections? Are these organizations that sit on both the vertical and horizontal dimension, for instance, INGOs and government agencies? What processes can best facilitate vertical connections between these actors?
3. What differentiates the mediation role from that of collaborative horizontalities? Is it possible and necessary for one actor to do both in VET ecosystems in African contexts?

VET learning systems: reflecting on ecological time

The transformative orientation at the heart of our project could be critiqued as normative or as an aspirational narrative. Aspirational narratives constitute a story of what should be but that evolves over time and through a deep understanding of the tensions and lock-ins between the ground narrative (or present reality) and the aspirational narrative. We remain cognisant that while the aspirational has intuitive appeal, it is important that we prioritize some critical elements that enable us to connect the aspirational narrative to the ground narrative as we frame our local VET agenda. We hence need to understand that the transition is a slow, long-term endeavour that requires multilevel engagement with hidden structures and mechanisms, including history and power relations present, as socioeconomic lock-ins have deep historical roots. We attempted to work across all four cases with a present–future spatiotemporal framing.

A multiscalar, spatiotemporal notion of skills ecosystems

As reflected in the preceding discussion, the social ecosystem for skills model offered us tools to conceptualize a place-based skill ecosystem. However, as we began to analyse the emergent relations and attempted to explore the transformative possibilities, the argument that skills ecosystem approaches hold potential for reimagining VET systems to be more inclusive and with power to address regional sustainable development praxis surfaced some challenges. These led us to explore how we could expand the framing of the social ecosystem approach as a multiscalar and spatiotemporal construct. In doing so, we drew on critical realism.

Critical realists argue that reality is both stratified – real, actual, empirical – and differentiated. This helped us to deal with the multiple levels in nonreductionist ways. By considering these layers of reality as we worked with the idea of multiscale, we were able to envisage structures and mechanisms that were operating even where they were ‘beneath’ the surface. Price (2012) explains that in open systems there is always a multiplicity of such structures and mechanisms operating. It is this multiplicity that generates the complexity of open systems such as skills ecosystems. Working with this idea of a layered reality helped us to conceptualize the interdependent planes constituting our skills ecosystems.

It is important to note that both the generative mechanisms of the real and the events of the actual are not necessarily reflected in the experiences of the empirical. Therefore, one cannot rely solely on the empirical evidence to reveal the causal effects of the phenomenon being researched. In the empirical domain, it is possible to identify experiences of knowing subjects (for instance, individuals working in the catering sector who reflectively shared their autobiographies of transition from learning to work). In the actual domain, one can identify events and their experiences by subjects (for instance, how a particular course or degree programme shaped the transition). In the domain of the real, one can identify both experiences and events, and the underlying mechanisms that generate these events and make them available to experience (for instance, how the existence of courses in a local college allowed an individual to study catering and thus become employed in the sector). However, a full analysis requires looking at all of these and their interactions with structures and their patterns of emergence, which help to understand that what is emergent in each level is related to the causal laws and mechanisms that exist in other levels in an open system.

Thus, from this background, our conceptual work involved conceiving of skills ecosystems as multiscale phenomena, constituted by interdependent planes. Though presented here as static, they are dynamic, having historical depth and being in the process of transitioning. In considering transitioning,

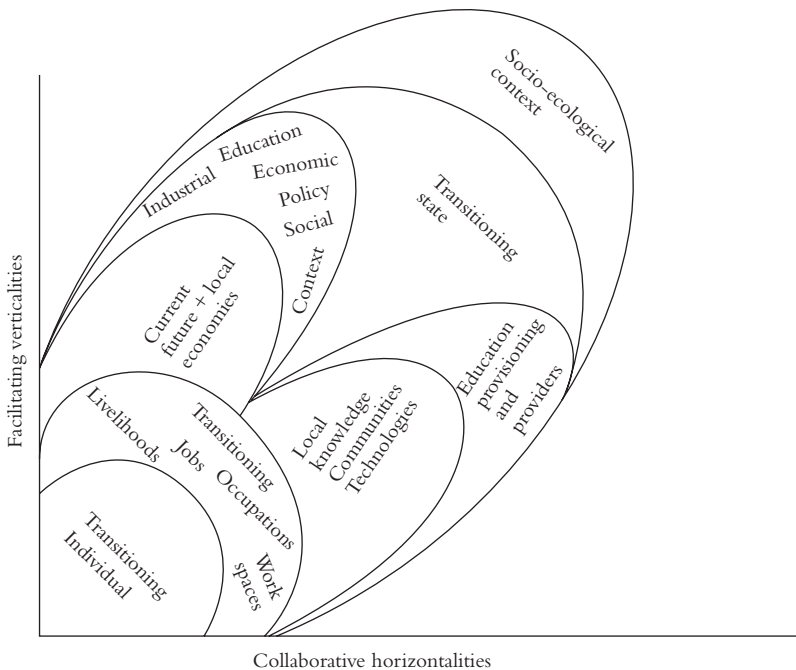
we need to explore what is absent as well as what is present. Our whole approach looks to what is emerging and what might be possibilities and openings for change. This is vital if we are to reimagine and build new approaches to VET.

Critical realism provides a crucial underlabouring to our expansion of the social ecosystem for skills approach. To this, we add a more explicit discussion and application of the notions of relational agency and relational capability, seeing relationality as implicit in previous ecosystems accounts. We also seek to draw on our explicit engagement with political ecology issues and the challenge of just transitions in this and the previous chapter to understand VET’s purpose as being about furthering collective human flourishing and integral human development. Spours points in this direction, but our political–economy–ecology analysis takes this much further.

From an analysis of how the cases represented their skills ecosystems, we synthesize the main elements emergent from the four VET Africa 4.0 cases into multiple levels of scale represented in our expanded social ecosystems for skills model, represented in [Figure 4.2](#).

In the figure, we illustrate that within our transitioning skills ecosystem, we studied the transitioning individuals who navigate learning and work

Figure 4.2: Expanded social ecosystem for skills model



transitions within VET systems into transitioning jobs and occupational roles. Within the ecosystem, it is necessary to understand current and future streams of work especially as we consider work that can strengthen future local economies (as these offer potential VET pathways). In considering this, we needed to examine current and future educational provisioning. For instance, in the Alice and Gulu cases we examined these current and future jobs and provisioning related to formal and informal contexts in [Chapter 5](#). These gave us the related stakeholders, intermediaries and policy contexts that connected the vertical and horizontal within the ecosystem. In trying to illustrate our working model, it is important to consider that the levels are iterative and draw their meaning from each other (what emerges in one level is contingent on the mechanisms at the other levels) and that each level attempts to surface related mediating factors and mechanisms between the vertical and the horizontal. This, we believe, presents challenging epistemological and spatiotemporal frames for future-focused skills ecosystems research.

The multiple processes of transitioning ecosystems depicted across our cases involve multiple actors and systems coevolving in step with each other. This in turn requires a refined lens to examine systemic transitions, agents, their agential capacity and what enables and constrains it. This helps us to deal with an important challenge raised by the first phase of our empirical work, that the current social ecosystem model for skills descriptive language inadequately conceptualizes actors, their agency and their relation to structure. Societies pre-exist the human agents who live in them and are a pre-existing condition for human activity. However, the ensemble of structures, practices and conventions requires human agency for their reproduction or transformation ([Joseph, 2002: 9](#)). Agency is linked to social structures, which stand as objects of study in their own right ([Norrie, 2010](#)). It is impossible to understand learners' agency in constructing their learning pathways without an understanding of social structures, and how they shape learners' choices, and how agents in turn shape them in the education system. Thus, people do not necessarily work to reproduce the capitalist economy and ignore environmental conditions, yet these results are unintended outcomes of their actions (reproducing structure) and the necessary condition of their acting (grounding and enabling or constraining their agency).

[Bhaskar \(1979\)](#) explains that social structures exist, are exercised and are being continuously reproduced or transformed only by virtue of, in and by human agency. This continuous reproduction or transformation of social structures can be understood through a system of mediating concepts that describe the point of contact between human agency and social structures. This mediation is significant to our argument about emergence within the ecosystem as it is at this nexus that agentive action arises ([Archer, 1995, 1998](#)).

This mediation is always evolving, dynamic and unpredictable (Agbedahin and Lotz-Sisitka, 2019). Hence, as we noted earlier, in the Alice case the focus was less on ‘who mediates’ but how collaborations could occur through mediation.

Conclusion

In the following four chapters, we will revisit the set of issues raised here through empirical examinations of four themes that are central to VET and this expanded notion of a skills ecosystems:

1. inclusivity, relationality and informality;
2. vocational teachers as mediators in complex ecosystems;
3. transitioning processes from learning to work; and
4. the role of the coengaged university as mediation partner in skills ecosystems.

Our intention in addressing this set of themes is to expand the social ecosystems for skills approach. Therefore, we have sought out areas that are not well developed in the literature. Thus, we look beyond the formal frame and at universities as well as conventional vocational providers and highlight the neglected central populations of education: young people and teachers. The chapters that follow are not intended to offer an exhaustive account of aspects of the social ecosystem for skills approach but rather to provide directions forward in exploring the concept of the social ecosystem for skills.

As we have argued in this chapter, the social ecosystem approach offers potentially important insights for thinking about future-focused VET. By extending its focus to Africa, addressing areas neglected in the approach thus far, and providing new insights into its relevance beyond highly formalized settings of work and learning, we will show through these chapters how the approach can work north and south and how our extension of it contributes to global VET debates.