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Skill Ecosystems in the Global South: Informality, Inequality, and Community Setting

Abstract. The concept of ‘skill ecosystems’ considers how contextual and institutional factors shape the acquisition and utilisation of skills. Although initially developed in the global North, there is value in applying this concept in the global South, where large-scale skill development and vocational education reforms are underway, many of which struggle with post-training skill underutilisation. The concept requires modification, however, if it is to be meaningfully applied in the global South. To date, skill ecosystem research has focused on skill utilisation in contexts of formal employment and the institutional actors who support it. In the global South, where most people are employed in the informal sector, a different approach is required, more sensitive to regional power structures and social inequalities. Geographical research on skills can help develop a more dynamic, relational, and power-inflected version of the skill ecosystem concept. Drawing on a short-term longitudinal study of agricultural skills trainings in India, this paper argues a geographically sensitive skill ecosystems perspective helps identify how context shapes the outcomes of skill development programs. To be meaningfully deployed in relation to informal sector work in the global South, however, it must be extended in at least three ways: (1) a different set of institutions and actors must be recognized as comprising the ‘ecosystem,’ particularly banks and rural services; (2) the community and family settings in which informal sector work takes place must be recognized; and (3) social inequalities must be considered to promote greater skill utilisation and more equitable outcomes.

1. Introduction

Since 2000, skill development and vocational education and training have been major policy priorities across the global South. Governments in Asia, Africa, and Latin America have sought to improve productivity, employment, and wages through upskilling and providing formally recognised vocational qualifications (Powell & McGrath, 2019). In international fora, this emphasis on skill development has been explained in terms of the need to improve educational access and create a workforce capable of responding to rapid economic, social, and ecological change (King, 2011; Reddy, 2018). At the domestic level, however, skill development drives have often been driven by a competitive race to attract foreign direct investment, particularly in relation to high-value sections of global supply chains (Ashton et al., 2005). This has been true of India, whose massive investments in skill development since 2006 have sought to position the country as a global ‘skills hub’ (King, 2012).

India’s skill development agenda faces numerous challenges, however, not least being problems with the outcomes of skill development programs. Available evidence suggests that many of those who receive training do not find work that utilises their skills (Panth, 2014). This problem is not confined to India, nor the global South; it reflects a widespread skill utilisation problem endemic to neoliberal capitalist development (see Streeck, 1989). In the global North, skill underutilisation is a chronic issue (Sonn et al, 2019), which affects women and minority groups disproportionately (Rafferty, 2020).

The concept of skill ecosystems, first proposed by Finegold (1999) and later elaborated by scholars from diverse disciplinary backgrounds (Hall & Lansbury, 2006; Cooney et al., 2010; Buchanan et al., 2017; Lotz-Sisitka, 2019), attempts to explain and address constraints, while identifying and enhancing enablers, to skill utilisation and continuous skill development. It pushes debates on skills beyond a binary focus on supply and demand for skilled labour (Hall &

Lansbury, 2006; Spours, 2019). It recognizes that policy focused exclusively on supplying skills through vocational training risks poor labour market outcomes, while policies driven exclusively by linking skill development to industry demand cannot address the problem of skills' underutilisation in the workplace. It instead emphasises how features of the social and institutional environment constitute 'ecosystems' that either support or constrain demand for skilled labour, skill utilisation, and opportunities for ongoing skill development (Hall & Lansbury, 2006). It resonates with arguments in economic geography that emphasise how institutional context shapes the outcomes of development interventions (Rodríguez-Pose, 2013).

Yet, the skill ecosystem concept needs to be extended to engage with the unique challenges of skill development in the global South. To date, skill ecosystems research has been almost exclusively focused on the global North (for recent exceptions, see Lotz-Sisitka, 2019; Wedekind, et al. 2021) and shown limited appreciation of how power relations and inequalities structure the social and institutional environments that shape skill utilisation. To understand skill ecosystems in the global South, requires an appreciation of how the environments in which skills are deployed are marked by informality, precarity, power imbalances, and inequality (Carswell & De Neve, 2018). In the global South, very large sections of the workforce are self-employed, work in family-based enterprises, or in the unregulated informal sector (Harriss-White, 2003). In such environments, the contextual factors that shape skill development and utilisation differ from those in formal sector employment settings in the global North.

To extend the skill ecosystem concept, this paper both draws on and advances perspectives from emerging research in geographies of skills. Recent research in historical and cultural geography has explored how skills move across space, changing as skilled practitioners respond to new materials, environments, and consumer preferences (Lea, 2009; Patchett, 2017; Mann, 2018). A small number of studies in geography have drawn attention to how power affects skill utilisation, by considering how hierarchically organised sites and networks, as well as particular policy settings, govern the assemblage, acquisition, recognition, and deployment of skills (Richardson and Bissell, 2019; Raghuram, 2021). Where these studies have examined skills in contexts of formal employment in which the wage relation dominates, I suggest such consideration of power relations proves equally valuable in understanding skill utilisation in small-scale entrepreneurship in the global South. I argue that a focus on global South contexts, in which informal sector livelihoods are the norm, can enrich the skill ecosystems concept and understandings of geographies of skills by spotlighting how a different set of environmental factors shape skill formation and deployment and drawing attention to matters of inequality in skill utilisation that prior research in these fields has largely overlooked.

2. The Concept of Skill Ecosystems: Towards a Human Geography Perspective

The concept of 'skill ecosystems' first appears in the scholarly literature in Finegold's (1999) analysis of 'high-skill ecosystems' in the biomedical and information technology sectors of Southern California. Finegold conceptualised high-skill ecosystems as geographically bound clusters within which 'high-level' skillsets become concentrated, where there is high demand for

these skills, and where dynamism emerges such that skills are continually refined and adapted to changing conditions. Finegold argues these clusters share four features with biophysical ecosystems: (1) a contingent catalyst that triggers ecosystem formation, such as a change in market dynamics or new technological innovation that stimulates demand for skills in innovative firms; (2) ‘fuel’ that allows those firms to grow and develop their capacity – a steady supply of trained workers and finance capital, for example; (3) an environment that supports high-level skills – such as good infrastructure; and (4) high-level interdependence between firms and other supportive institutions which, as in biophysical ecosystems, gives high-skill ecosystems self-corrective mechanisms that increase their resilience. Dense social networks within these ecosystems and research-industry linkages encourage fresh ideas to circulate, leading to continual innovation and continuous demand for new, high-level skills.

The skill ecosystem framework challenges conventional thinking on skill development in research and policy. Previous approaches assumed either state-led development, with an emphasis on increasing the supply of skills through education and training in accordance with government planning, or the neoliberal model of adjusting the training system to industry demand. As Hall and Lansbury (2006) note, while neoliberal ‘demand-driven’ approaches may have increased the likelihood of post-training employment, often skills developed during training would not be utilised in the workplace and employees lacked opportunities to develop skills further. The result was often career stagnation and job dissatisfaction. The skill ecosystem approach represents a step forward in considering how the demand, utilisation, and ongoing development of skills are shaped by contextual factors – often at local and regional scales – including the effects of government policies, institutional frameworks, and market conditions (Buchanan et al., 2001; Capsada-Munsech & Valiente, 2020). Skill ecosystems researchers advocate governments’ facilitate dialogue between diverse actors who shape business decisions about skill utilisation and development at regional scales – such as employers, industry associations, local governments, planners, and policy makers – to identify bottlenecks and devise effective solutions (Payne, 2008; Buchanan et al., 2017; Hodgson & Spours, 2013).

Subsequent research has examined the contingency and fragility of skill ecosystems. Ecosystems may depend on the functioning of institutions that themselves occupy precarious positions. Cooney et al.’s (2010) research on skill ecosystems for meat processing workers in Australia shows trade unions play critical roles in providing information to workers on job opportunities and the need to update skills in response to new health and safety regulations. Yet, they also show how changes in industrial relations legislation dramatically altered the relationships between employees, unions, and employers, undermining the role of unions within this skill ecosystem in ways that had adverse effects on skill uptake and deployment. Greater collaboration between actors operating at multiple scales – whose interests may seem opposed – is thus critical in ensuring ecosystems remain coherent and resilient when faced with macro-level policy disruptions (Hodgson & Spours, 2013). This has led to an interest in actors capable of bridging the scales that comprise skill ecosystems to enhance their coherence, including careers’ counsellors, planners, regional development councils, and relevant industry representatives (Dalziel, 2015; Hodgson & Spours, 2013; Lotz-Sisitka, 2019). Incorporating these mediating actors into skills planning may offer a horizontal, place-based alternative to the hierarchical

state- or market-led approaches that have been historically dominant (Spours, 2019; Powell, 2021: 95).

In its consideration of how regional context shapes skill formation and deployment and its sensitivity to matters of scale, the skill ecosystem concept is implicitly geographical. It resonates with economic geographers' concerns with how institutional environments shape outcomes of development interventions (Rodríguez-Pose, 2013) and with macropolitical determinants of skill underutilisation (Sonn et al, 2019). Yet, skill ecosystems research may be enriched through closer engagement with emerging research from cultural and historical geographers on skills. These researchers have explored the enabling conditions by which skilled practices diffuse across space and endure across time (Lea, 2009; Patchett, 2017; Patchett & Mann, 2018; Mann, 2018). Drawing partly on Deleuze (1994), Ingold (2000) and Grasseni (2010), this research highlights how skills are not simply applications of abstract rules and principles but are responsive to the ever-changing features of the skilled practitioner's environment. Becoming skilled is not simply to receive training and acquire the correct cognitive templates to inform practice, but requires the skilled practitioner to attend to features of their environment that are relevant to their practice (materials, customers, other producers, and so on), and respond appropriately (Lea, 2009). Features of the environment can be more or less enabling to skilled practices and, as such, skills are not simply possessions of the skilled practitioner, but products of the 'generative potential of the relations [they are] enmeshed within' (Mann, 2018: 97; see also Dewsbury & Bissell, 2015; Fischer & Bottinelli, 2018). Geographers of skills also draw attention to how changes in the environment can undermine or enhance the reproduction and spread of skills (Patchett, 2017). These include changes to the availability of materials (Mann, 2018), to forms of government regulation (Adams, 2018), to place-specific economic compacts (Gibson, 2016), or to the social relations of skill transmission (Gough et al, 2019). These scholars share with skill ecosystems perspectives a concern with how the social and institutional environment enables or constrains skill utilisation but attend to the more dynamic and relational features of that environment.

Geographers have also highlighted how power relations shape opportunities for skill utilisation. Richardson and Bissell (2019) consider how the political and economic interests of powerful actors and institutions shape the valuation of skills and enable and constrain their usage. These include macropolitical factors – the political and economic influences that shape how forms of labour are categorised as 'skilled' or 'unskilled,' in turn influencing their remuneration (see Heslop & Jeffery, 2020) – and micropolitical factors – i.e., power relations specific to individual workplace environments, which enable or constrain certain labour performances. Similarly, Raghuram (2021) considers how particular sites are involved in not only imparting skills, but in organising categories of skilled performances into hierarchies. Raghuram also notes that access to the right social networks is important in both acquiring and utilising skills, and that the structure of networks reflects histories of privilege and deprivation. While skill ecosystems research has drawn attention to the social-environmental influences on skills, research in geographies of skills reminds us that such environments are comprised of competing interests and shaped by political agendas. As I suggest below, this has implications for *whose* skills are

developed, utilised, and socially valued – and this is particularly important when considering skill ecosystems in Southern contexts.

2.1. Skill Ecosystems in the Global South

A geographically informed skill ecosystems perspective can advance debates on skill development in the global South – India in particular. Much of the initial thrust of what is now called the *Skill India* initiative did not proceed from an ecosystemic perspective. It instead focused on increasing the supply of skilled labour, with ambitious targets to provide vocational training to some 500 million workers by the early 2020s (King, 2012). Not only were such targets unachievable, it was soon recognised that increasing the supply of skilled workers would not be sufficient to improve employment outcomes. Research suggested most graduates from vocational training programs in India did not find jobs in their field of training (Panth, 2014; Ruthven, 2018). Thus, in 2017, the Government of India switched from a supply- to demand-driven skill development policy: a welcome shift, yet still problematic from a skill ecosystems perspective, since even when skills may enhance productivity, industry may not ‘demand’ them or may be unable or unwilling to utilise them (Hall & Lansbury, 2006). In India, most small-to-medium enterprises prefer ‘unskilled’ labour, which can be paid low wages and receive on-the-job training where necessary (King, 2012). India – like many countries across the global South – already faces chronically high levels of educated unemployment (Jeffrey et al., 2008) and hence cannot afford to ignore these impediments to skill utilisation. A skill ecosystem perspective has value in attending to the contextual factors that generate such impediments and the mechanisms to overcome them. Moreover, its emphasis local and regional enablers and constraints to skill utilisation may offer an important corrective to the centralised, national-level approaches to planning skills policy evident across the global South, which previous research has found to be insensitive to local needs and regional differences (Lotz-Sisitka, 2019; Ruthven, 2018; Brown, 2020b).

Yet, the skill ecosystems concept requires further development to be usefully deployed in the global South. The concept has mostly been applied in a small number of relatively wealthy, advanced capitalist economies (Buchanan et al., 2017). This has led to a focus on formal sector employment, which has limited relevance in the global South, where the economic landscape is more heterogeneous and most workers find their livelihoods in the informal sector (Wedekind et al., 2021). The informal sector may be defined as the sections of the economy that fall outside the purview of government regulation, consisting predominantly of small-scale and family-based enterprises and sole traders (Harriss-White, 2003). In India, firms employing fewer than three persons – which comprise most of the economy – have historically been exempted from laws governing labour protections. Yet, as Harriss-White (2020: 37) notes, this lack of government regulation does not mean the informal economy is not regulated at all – it is, rather, ‘socially regulated by norms of caste, locality, and gender.’ The social institutions regulating the informal sector police access to employment and services and shape the valuing of labour and commodities in ways that are both regionally specific and socially discriminatory.

The upshot of the dominance of the informal sector for understanding skill ecosystems in the global South is threefold. First, given the preponderance of small-scale enterprise, it requires attending to a different set of institutional actors that shape skill development and utilization than in national settings marked by higher levels of formal employment, where larger corporations and regulated markets play a greater role. Institutions providing financial and other forms of assistance to small businesses, including banks, government departments, and non-government organisations (NGOs) all play critical roles in shaping the nature of work – and hence skills – within the informal sector (Bigsten et al., 2004). As Wederkind et al. (2021) demonstrate, these institutional actors that comprise informal sector skill ecosystems are often weakly integrated – and poorly-resourced governments in the global South may struggle to mediate between them. Second, given the significance of social regulation in the informal economy, there is a need for greater attention to the community and family settings in which work takes place. Third, in these settings, hierarchical and exploitative social systems, such as patriarchy and caste dominance, shape the way in which skills are valued, developed, and used (Carswell & De Neve, 2018). Hence, any effort to understand skill ecosystems here must be sensitive to power imbalances and sources of social inequality.

Skill ecosystem research has rarely focused directly on social inequalities. Its focus on the importance of connectivity and collaboration between actors is important, but overlooks how relations within social systems are marked by inequalities and asymmetrical power. While the focus on the contextual factors shaping skill utilisation is welcome, there is a broader subset of questions on *whose* skills are utilized and valued and who has meaningful opportunities to continually develop their skills (Powell, 2021). Unjust social conventions may discourage the development and utilisation of skills by women and marginalised communities (Carswell & De Neve, 2018). Moreover, some groups may have privileged access to institutions and networks that enable skill utilisation – which may come at the expense of access for other, less privileged groups (Rao, 2018; Raghuram, 2021). It is surely a shortcoming of skill ecosystems research in the global North – and indeed, most of the recent research on geographies of skills – that it has not explored these questions of inequality to date. In the global South, they are impossible to ignore.

It is therefore imperative to understand how social actors are differentially positioned with respect to the opportunities for skill development and utilisation that skill ecosystems provide. Carswell and De Neve's (2018) research on skills in the garment sector of Southern India demonstrates how social processes and inequalities shape how skills are accessed, mobilised, valued, and remunerated. They argue for greater attention to 'the social life of skills,' which they define as 'the social processes, relationships, and ideologies that enable (or constrain) people's access to skills, and subsequently to employment, wages, satisfaction, and dignity' (Carswell & De Neve, 2018: 313). By drawing attention to the role of patriarchal household structures, caste hierarchies, and the local political economy, their research demonstrates how inequalities of gender and caste are often more decisive in shaping opportunities for skill acquisition and remunerative skill utilisation than formal training. Other research in the global South has drawn similar conclusions, highlighting how people's aspirations for skills (Nambiar, 2013; Brown, 2020a), their access to opportunities to learn (Gough et al., 2019), and their capacity to apply and

continuously develop skills in workplace settings (Baviskar, 2016) are profoundly shaped by social relations and the social inequalities that imbibe them. Such research can enrich skill ecosystems thinking by spotlighting the mechanisms by which the social environment enables or constrains skill utilization while also being sensitive to sources of social inequality.

3. Regional Context and Research Methods

The research that informs this paper was conducted between 2018 and 2020. It examined agricultural training programs introduced under the aegis of the Agricultural Skills Council of India (ASCI) as part of the broader *Skill India* initiative. The focus on the agricultural sector – which in India, largely consists of family-based units of production – was valuable in exploring themes of skill development in the informal sectors of the global South.

ASCI, like most sector skill councils, had not explicitly adopted a skill ecosystems framework. They seek to involve industry in the development of curricula, but otherwise have not sought to create an enabling environment for skill utilisation beyond the provision of training. There was, thus, value in attending to the key features of the environment that enabled or constrained skill development or deployment, to conceptualise what an effective skill ecosystem approach may entail in this context.

Trainings examined were modular, of approximately 4-6 weeks' duration, each focusing on one activity within the agricultural sector. The trainings that were the focus of this study were on organic agriculture, dairy, poultry, mushroom cultivation, and beekeeping. They took place in the states of Punjab and Himachal Pradesh. These states offered a useful contrast in terms of the features of their agricultural skill ecosystems. Punjab, on the Indian plains, was the heartland of India's Green Revolution in the 1970s, which saw the consolidation of a class of commercial farmers with relatively high income (Byres, 1981). Yet, today it suffers from a lack of agricultural diversification, economic stagnation, and concerns regarding ecological toxicity and public health emerging from excessive use of agri-chemicals (Brown, 2018). Himachal Pradesh is a mountainous state where landholdings are small and terrain places constraints on opportunities for intensive cultivation. Yet, it is also known for its relatively well-functioning government departments and high indicators of human development (Fischer, 2017).

The research followed a short-term longitudinal design, in two phases. In the first phase, 82 trainees enrolled in 8 different ASCI-affiliated training programs were interviewed. Interview questions concerned their background, family and livelihood situation, why and how they came to enrol in the course, their impressions of the course, and plans after completion. Trainees also completed a short survey regarding their basic demographic characteristics. During the second phase of research, conducted approximately one year later, trainees were interviewed again to explore what they had done with the skills they had acquired (if anything), challenges encountered, and whether and how they developed their skills further. 51 of the initial 82 trainees participated in these follow-up interviews. While interviews during the first round were mostly conducted at training sites, most in the second round were conducted with trainees at their homes

and farms. This meant that during the second round, there were also opportunities to gain a better sense of the social environments within which skills were applied.

The demographic characteristics of participants in each of the two rounds of fieldwork are documented in Table 1. There were fewer female than male participants in the study. This was reflective of the composition of trainees enrolled in training programs – there were fewer women than men in all except one training program in Himachal Pradesh and there were no women enrolled in any training programs studied in Punjab. Members of the Scheduled Castes (SCs) and Scheduled Tribes (STs) – groups regarded to have suffered from historical and contemporary disadvantage – were slightly under-represented in the study relative to their share of the population in their respective states. Members of Other Backward Castes (OBCs) – intermediate castes deemed to suffer some disadvantages – were better represented.¹

[Table 1 near here]

Data were analysed in three stages to assess how contextual factors shaped skill utilisation. First, trainees who participated in the follow-up interviews were classified into one of six categories based on the extent to which they had applied the skills acquired in the training program. The first two categories were for those with no prior involvement in the activity for which they had undertaken training. They were classified as either having made a start in a venture related to the training, or not. The remaining four categories were for those who had some prior involvement in the activity of training. They were classified as either having withdrawn from the activity; having made no changes or very modest changes; having made modest changes; or having made substantial changes. ‘Changes’ here referred to either an identifiable change to practice attributable to training or having upscaled or diversified their agricultural venture.

In the second stage of analysis, interview data were subject to further analysis to determine some of the key factors that trainees described as having impacted their level of skill utilisation, whether enabling or constraining. These factors were coded and their frequency noted. This stage of analysis helped identify the key actors and institutions that comprised the relevant skill ecosystems. In a third stage of analysis, these factors were subject to a more qualitative interrogation, to determine how and to what extent they affected outcomes. During this stage, attention was directed to how various sources of social privilege and disadvantage affected outcomes, particularly gender, age, caste, region, and socio-economic status, which enabled an assessment of how social position affected access to skill ecosystems.

4. Findings

4.1. Levels of Skill Utilisation

Overall, training had positive skill utilisation outcomes. Slightly more than half of participants either started new ventures related to the topic of training, adopted new practices, or upscaled

¹ SCs, STs, and OBCs are categories used for governments’ positive discrimination efforts in India. Other, more privileged castes are referred to as ‘general castes.’

existing ventures. Yet, there were substantial differences in outcomes on various axes of social difference, as shown in Table 2. There were substantially better outcomes in Himachal compared to Punjab. Women were more likely to have started a new venture than men, and less likely to have withdrawn from an existing venture. Yet, women were less likely to have *substantially* changed existing ventures. There were also better outcomes for General caste trainees than for other castes.

[Table 2 near here]

There were clear age-based differences in outcomes. Younger trainees were less likely to have started a new venture and more likely to have left an existing venture. This may have been because younger participants were more concentrated in Punjab, which had less overall skill utilisation, but also reflected contextual factors impinging on young people's lives, particularly the social and economic pressure on young men to pursue non-agricultural livelihoods. In some cases, young people did not start ventures related to their training because they availed opportunities for paid employment or education or decided that agriculture was insufficiently profitable. This was particularly true of more privileged youth, for whom non-utilisation of skills reflected upward mobility. For less privileged youth – including those from SC and OBC backgrounds – non-utilisation of skills was less a matter of choice and often reflected institutional constraints that prevented them attaining the finance or assets necessary to apply what they had learnt.

4.2. Social Determinants of Skill Utilisation

When trainees reflected on factors explaining their post-training skill utilisation, very few regarded the strengths or weaknesses of training to be decisive. What almost all trainees identified as crucial determinants of their outcomes were the social, institutional, and infrastructural supports they received, or did not receive.

Tables 3 and 4 list the social and institutional factors that trainees identified as enablers or constraints on skill utilisation and the number of trainees who mentioned them as important factors. They also show the differences between states, genders, ages, and castes in the frequency with which these enablers and constraints were reported. As these tables suggest, there were glaring regional differences, with trainees from Punjab indicating far fewer enabling factors than those from Himachal, and somewhat more constraints. Young people and members of marginalised castes – particularly SCs – similarly expressed fewer enabling factors than their elder and general caste counterparts. While women reported comparatively fewer constraints, this was largely because (a) women were entirely in Himachal, where conditions were overall better – amongst participants from Himachal, women experienced fewer enabling conditions than men; and (b) the barriers experienced by women also came *prior* to training, such that only women who were somewhat likely to utilise skills were allowed by family members to attend training in the first place.

[Tables 3 and 4 near here]

Qualitative analysis showed that gender, caste, age, and social connections played very significant roles in determining whether skill ecosystems were enabling or constraining. When older upper caste men with connections identified enabling factors had helped them achieve their results, these typically were more profoundly enabling than the factors reported by women, youth, and lower castes, suggesting the discriminatory character of skill ecosystems as a factor worthy of attention. In what follows, I draw on the qualitative findings to elaborate on how the most prominent of these enabling and constraining factors played out on the ground.

4.2.1. Finance and Government Assistance

The ability to avail financial assistance – either from banks or government schemes and subsidies – was the most decisive factor shaping skill utilisation. During the first round of interviews, a large majority of trainees indicated that they had been told – by training providers, other farmers, or delegates from local banks or government departments – the principal benefit of having a training certificate was that it would help them access subsidies or loans at favourable rates. While some trainees were sufficiently financially secure as to not require such assistance, most were at least interested in exploring this option.

10 trainees availed some form of support from either local governments or state government departments. The government assistance was not in all cases financial. In some cases, it was, rather, a continuous line of advice. Those who received more tangible support from governments, such as subsidies or free assets, were entirely general caste men over the age of 30. None indicated that their training certificate helped them avail this assistance.

Most trainees did not receive what they believed had been promised them in financial assistance. Only 2 were able to secure bank loans, though others tried. Many of those who visited banks or government departments seeking assistance found that either they did not meet eligibility criteria (often on grounds of scale – supports were either for larger or smaller ventures than theirs) or their training certificates were not recognised. Others said banks wanted significant collateral or onerous amounts of paperwork. Some trainees suspected that bank or government employees were anticipating bribes or exhibited favouritism towards those with connections.

Access to finance was structured by multiple axes of inequality. Class played a role. Having land to provide as collateral was usually a precondition for bank loans – and many trainees did not have substantial landholdings. However, it was not only this. My interactions with local bank workers found it is common practice for banks to undertake background checks on loan applicants, which may entail questioning neighbours about their suitability. This introduces numerous problems. The views of neighbours can easily be influenced by class, gender, religious, or caste prejudice. For example, there is a common stereotype in rural India that SCs are not good businesspeople, which may influence perceptions of their suitability for loans. Due to their lack of assets, SC trainees were often the most dependent on loans to start new ventures, but were unlikely to receive them.

Not receiving expected financial assistance had adverse impacts. Based on trainers' promises of easy access to financial assistance, several trainees made plans to work at a larger scale and, in some cases, acquired land or built facilities such as animal sheds in the expectation that loans or subsidies would be approved. When approvals were not forthcoming, they were left overcapitalised, or forced to operate on a scale too small to be profitable. Two participants who had undertaken animal husbandry training spoke of being forced to build cheaper animal sheds that were not to the hygiene specifications they had learnt during training.

These issues speak to the importance of banks within the skill ecosystem, and qualification recognition problems that may arise when such significant actors are not suitably integrated into that ecosystem (see Lotz-Sisitka, 2019). The unequal distribution of outcomes suggests occupying privileged positions within local social networks may also play a role in accessing enabling sites within skill ecosystems (Raghuram, 2021).

4.2.2. Market Conditions and Market Access

Adverse market conditions constrained options for skill utilisation. They took several forms. Some trainees were constrained by a lack of available or affordable assets and inputs – including land, technology, feed, and livestock. Others lacked access to markets at which they could sell produce at reasonable rates or faced exploitation by market intermediaries. This reiterates a point raised in previous research on skill geographies – that skills can be inhibited or forced to adapt as environmental factors change, including availability of materials (Mann, 2018) or consumer preferences (Lea, 2009).

Adverse market conditions hindered progress for those seeking to upscale. Both those who indicated they had been unable to make significant changes and those who had made some progress suggested they would have achieved more, were it not for various barriers preventing them from obtaining fair prices for their produce or acquiring assets needed to upscale. A key skill acquired during training was what Grasseni (2010) calls 'skilled vision' – i.e., the capacity to discern attributes of inputs that will improve production and outputs that are socially valued. For example, dairy trainees learnt about the characteristics of different breeds of cattle and feed types. Under ideal conditions, applying this skilled vision might improve production. Yet, local cattle markets provided trainees with limited options, while optimal feed was prohibitively expensive or only available seasonally.

The kind of restrictions imposed by adverse market conditions were regionally specific. In Punjab, most trainees spoke of problems associated with market domination by traders, exporters, and large agri-business. These agents were said to exploit producers by refusing to provide fair prices or failing to settle outstanding payments. Stalled payments from traders could throw trainees' plans to expand their businesses into disarray. There were claims of more egregious forms of corruption amongst these agents, including tampering with milk or honey to lower its price. A lack of effective government regulation and the structurally weak position of unions and producers' associations meant unscrupulous traders often went unchecked. Amongst

those hoping to start new ventures, fear of exploitation when acquiring assets could inhibit decisive action.

In Himachal, such claims were less frequent. More common problems related to a lack of thick markets – particularly for premium products that training had taught them to appreciate (e.g. protein-rich milk; exotic mushroom varieties). Accessing markets could also be a challenge, given the poor-quality roads in upland and remote parts of the state. Aspiring organic farmers in Himachal faced significant challenges, since in local markets consumer aesthetic preferences meant they tended to be paid less for organic produce than those utilising chemical inputs. Such experiences made several of those who undertook organic training reluctant to apply their new skills on a commercial scale.

4.2.3. The Training Provider

Training providers performed several functions to support post-training skill development and utilisation. Many trainees indicated they had called their trainers or other experts from the training institution by phone to seek advice – both in relation to the topic of their training and other agricultural activities. Others – though less frequently – reported that their trainer had personally visited their farm to observe their work and provide feedback. Once trainees had established a new venture, trainers could help them develop marketing strategies. Where possible, they provided cheap inputs and made them aware of government grants or subsidies. They could connect trainees to specialised agricultural experts and advise them on other, more advanced training they may seek to undertake. Trainers also facilitated the formation of WhatsApp groups and other platforms to help trainees remain connected with each other and facilitate peer-to-peer learning and the formation of communities of practice (Lave & Wenger, 1991). In these various ways, training providers played ‘linking functions’ or ‘mediation’ identified as critical within skill ecosystems research, enhancing the coherence of the skill ecosystem (Spours, 2019; Lotz-Sisitka, 2019; Wedekind et al., 2021).

There were, however, stark differences in the type and extent of support training providers gave – and between trainees in the support received. Some trainees did not receive support at all, and this tended to be accompanied by strongly expressed negative attitudes towards the training provider. Some spoke of feeling abandoned:

[After training] there was no contact between us. There should have been some meeting. But it's like we're strangers to them now.

For this trainee – and several others – the seemingly transactional nature of the training went against cultural expectations that participation would foster an ongoing personal relationship with the trainer.

There were several reasons why some trainers were not forthcoming in supporting former trainees. In some cases, trainers became unresponsive when trainees made inquiries for which they were ill-equipped to assist – such as when they asked for help accessing loans or subsidies. Yet, there were also clear patterns in who received support from their training provider. Regional

differences were stark, with only 3 trainees in Punjab receiving follow-up support from trainers, suggesting state-wise differences in expectations of trainer responsibilities. Yet, in both Punjab and Himachal, trainers exhibited a preference for ‘picking winners’ – selecting trainees who had high chances of commercial success and providing them extensive support. Those who received such support were entirely general caste, well-connected men with the means to establish commercial ventures (those least in need of additional support). Most of them were older and had established a personal rapport with the training provider. These men received regular visits from their former trainers and were made aware of grant opportunities. One trainee in this category had his village ‘adopted’ by the training provider and served as the local conduit for flows of funds, goods, and training programs. It is likely that these trainees received such attention because they could later be showcased as ‘model farmers,’ and indicators of the success of the training provider in fostering local entrepreneurship (see Taylor & Bhasme, 2018). Trainees who had particularly strong relationships with trainers had often cultivated these over long periods of time. These individuals – mostly upper caste men – were aware of the value of social capital and confident in their capacity to develop it.

Women, OBCs, and those with limited farmland tended to receive more modest support – if any – such as occasional advice over the phone or WhatsApp. Most SCs reported negative interactions with former trainers – some indicating that they had not received promised assistance, others that they were treated dismissively when they approached trainers for help. Given the constructive role training providers otherwise play in bringing coherence to skill ecosystems, that they might reinforce or amplify inequalities within those ecosystems is concerning. In Raghuram’s (2021) terms, training centres served as important ‘sites’ for imparting and validating skills, but privileged access to social networks determined how empowering these sites could be.

4.2.4. Rural Services

Various agencies in India, both public and private, provide farmers with advice, services, and inputs. The nature of trainees’ relations with these agencies could prove critical in shaping their confidence – in turn affecting the likelihood of skill utilisation. For those who had undertaken training in animal husbandry, good relations with reliable veterinary doctors was highly beneficial. Having confidence in veterinary doctors reduced concerns about animal health. In some instances, veterinary doctors helped trainees to acquire new skills, such as administering vaccines. This tended to occur when trainees had forged positive personal rapport with doctors – and this happened largely amongst members of general castes, again reiterating the importance of access to social networks. Conversely, when trainees believed local veterinary doctors were unreliable (not coming when called) or negligent (taking ‘short-cuts’ at the expense of animal health) this could undermine confidence. This problem was keenly felt by SC dairy farmers in Punjab, who indicated that local government-run veterinary services were unreliable – often understaffed – while private providers tended to give misleading information and charge extortionate rates. This diminished these farmers’ confidence that they could guarantee their cattle’s health, making the acquisition of new cows to expand their business a risky prospect.

4.2.5. NGOs and Civil Society

14 participants were supported in applying skills or finding new opportunities to develop skills by civil society organisations. These organisations included farmers' unions, self-help groups, Hindu nationalist organisations, development NGOs, and producer's associations. The support they provided ranged from information provision, to organising training camps and mobilising expertise, to more material supports, such as cheap inputs and assistance with new constructions such as poultry sheds. A beekeepers' association performed tasks that mitigated otherwise constraining features of the skill ecosystem – such as negotiating with middlemen. In some cases, these civil society organisations were horizontally networked with training providers (as described by Spours, 2019), but the extent of active collaboration between them was limited.

Some civil society organisations played supportive roles for individuals who might otherwise have faced constraints to making remunerative use of their skills, including young people, women, and members of disadvantaged castes. Women were particularly likely to be involved in civil society organisations that were in some way beneficial to them – 8 of the 13 women interviewed in the follow-up round of the research indicated some level of involvement.

Yet, while civil society organisations offered benefits to marginalised groups, they were not entirely egalitarian. Often benefits were distributed unequally within organisations. Those who occupied positions of influence within groups tended to capture most benefits (see Platteau, 2004), and often these were older, better-educated trainees from relatively well-connected families. In one self-help group, for example, junior members resented that they were not getting their fair share, claiming the group's convenor was taking most of the free inputs the group provided for herself or her circle of close friends. Those occupying less influential positions within organisations gained only modest benefits. Those who felt excluded from groups or who did not gain promised benefits from them tended to experience civil society organisations as constraining factors (amplified when they had to compete in the marketplace with group members receiving more substantial benefits).

4.2.6. Family Support

Families supported the application of new skills by providing labour, social networks, and moral encouragement. In a small number of cases, skilled senior family members provided opportunities to engage in practical learning, thereby facilitating ongoing skill development. In other cases, family could be discouraging of new ventures. This was particularly constraining for youth and women.

Whether an enabler or constraint, family's influence on skill utilisation tended to reflect local power relations, particularly the patriarchal and gerontocratic household structures that are regionally normative (Harriss et al., 2020). Those who found family enabling were overwhelmingly men, who were able to establish businesses in which they could use their skills in a relatively short time due to the unpaid labour (and often, unrecognised skills) of wives,

mothers, or daughters-in-law. This was particularly the case amongst male dairy farmers in Himachal, for whom female family performed most daily tasks of milking and feeding.

Family factors that constrained skill utilisation were similarly power-inflected. In some cases, women experienced challenges applying skills when they had limited decision-making power over the use of land, domestic space, and their own time. For them, applying skills in desired ways often required bargaining with family – particularly when skill utilisation might come at the expense of domestic duties. The same could be said for some younger men, whose skill utilisation was subject to the approval of household elders – and who faced the burden of family expectations that they find non-agricultural paid employment. Family members' caste dispositions also played a role in some cases. For 3 older, high-caste men, family concerns about engagement in activities considered to violate caste purity norms became a constraining factor. Thus, while family provided the social connections and moral support that skill ecosystems research recognises as important to supporting skill utilisation and ongoing skill development, it did so in ways that enhanced inequalities and entrenched existing power structures and social role prescriptions.

4.2.7. Community Support

Community members provided similar supports to families. Several trainees – all in Himachal – indicated receiving helpful advice from more experienced neighbours and friends. Some found opportunities to gain practical experience by working alongside them. Friendship networks could be useful outlets to sell produce – particularly for those operating on a small scale. For those who already commanded significant respect within communities – mostly higher caste men – neighbours' praise for their agricultural innovation was encouraging.

Yet, community could also be a source of discouragement and gossip. This could frustrate plans to develop new skills, particularly for younger people. Those who sought to develop skills that in some way violated community expectations could invite negative commentary from neighbours and members of one's caste community. Several young and middle-aged men were discouraged from engaging in agricultural ventures because they were not seen to be remunerative and hence went against (age-specific) male breadwinner norms. Women could be victims of gossip when they sought to develop skills related to agricultural entrepreneurship – in contexts where selling agricultural produce is seen to be 'men's work.' Caste-related gossip could also deter efforts – whether directed at upper caste people for engaging in ventures (such as poultry) deemed ritually polluting or lower caste people being subject to community stereotypes that they are incapable of successful entrepreneurship.

While the proportion of participants in Punjab and Himachal who reported community as a constraining factor was similar, the severity of these constraints was greater in Punjab. There, negative community feedback went beyond discouragement and into overt ridicule. Participants from Punjab expressed shame at the thought of asking community members for help. In Himachal, although community discouragement was not absent, there was also evidence of a greater cultural disposition towards sharing knowledge. Some, particularly those from lower

castes or living in relatively remote villages where livelihood options were constrained, indicated a community expectation that one share one's knowledge of whatever new techniques or livelihoods prove profitable. Himachali women tended to work in cooperative ways with others in their communities to find approaches that would work. These regional differences reflect divergent agrarian structures and histories. In Punjab, a long history of commercial agriculture has encouraged greater competition within villages (Shiva, 1989), whereas in Himachal small landholdings necessitate tapping community resources and there are long histories of communal labour (Fischer, 2017).

While some skill ecosystems researchers emphasise the importance of community in fostering more democratic skill ecosystems (Spours, 2019; Powell, 2021), these findings suggest that possibilities for community collaboration hinge on regionally specific economic structure and institutionalised norms governing social and economic interaction. Moreover, the findings reiterate that communities are not always egalitarian and can be sites of discrimination in which normative social roles are reinforced, inhibiting skill development and utilisation.

5. Discussion

The findings suggest some of the key institutions and actors that comprise agricultural skill ecosystems within these localities. While the specific features of these ecosystems will vary regionally and across activities and skillsets, the findings nonetheless suggest three key characteristics of skill ecosystems in the global South that differ from skill ecosystems as discussed in global North contexts.

First, in the global South, some of the most relevant institutions, actors, and environmental conditions within the skill ecosystem are those that support skill utilisation in the informal economy (Wedekind et al., 2021). This contrasts with skill ecosystems research findings in the global North, which emphasise actors shaping skill utilisation within formal employment, such as employer associations and development planners (Buchanan et al., 2017; Hodgson & Spours, 2013), trade unions (Cooney et al., 2013) and careers counsellors (Dalziel, 2015). As the informal economy is largely comprised of small-scale enterprises, self-employment, and family-based employment (Harriss-White, 2003), this means, chiefly, those institutions and actors that support small-scale entrepreneurship. The findings suggest that access to supports – including from government departments, banks, services, training providers, and civil society organisations – are highly important in supporting skill utilisation. Moreover, as largely precarious self-employed producers in the informal economy, the opportunities for participants in this study to utilise skills were profoundly shaped by prevailing market dynamics and their levels of access to markets. These market factors varied regionally, due to the availability of materials, the concentration and preferences of local consumers, and the nature of social networks, reinforcing perspectives in geographies of skills that emphasise how these factors shape skilled performance (Mann, 2018; Lea, 2009; Raghuram, 2021).

For these skill ecosystems to function well requires coordination between the actors and institutions that comprise them (Lotz-Sisitka, 2019; Hodgson & Spours, 2013). As Spours (2019)

and others suggest, particularly important are actors capable of mediation between potentially enabling governmental supports and the horizontal relations between communities and other supportive local and regional institutions (Powell, 2021; Wedekind et al., 2021; Dalziel, 2015). In the present study, the key actors who enacted this mediation and ensured the coherence of skill ecosystems were training providers, who linked at least some trainees to others who could support them starting new ventures or further developing skills. Yet, trainers' capacity for mediation was typically only at the local scale. Some of the chief failures of skill ecosystems observed in this study – notably, a lack of qualification recognition by banks and government departments – points to the need for greater coordination at the national and regional level – a role which ASCI may have been better placed to enact. While ASCI had involved agribusiness in planning and curriculum development (aligning with skill development discourses originating in the global North) there may have been benefits to explicitly adopting an ecosystems framework and working with actors more relevant for supporting small-scale entrepreneurship. This, however, can be challenging in global South contexts, where governments may lack resources to finance actors capable of such mediation (Wedekind et al., 2021).

Second, due to the family-based nature of enterprises in the informal sector and their social embeddedness, community and family are significant constituents of informal sector skill ecosystems. Community and family prescribe the norms and values surrounding skill acquisition which allow skills to function as sources of identity and belonging (Lave & Wenger, 1991). The findings showed that family and community support was decisive in providing trainees with the motivation to persist with skill acquisition and utilisation. Yet, these family and community settings are also socially discriminatory sites where norms of gender, caste, age, and ethnicity regulate who has opportunities to acquire, utilise, and benefit from skills (see Harriss-White, 2020; Carswell & De Neve, 2018). In the present study, women and lower caste people were discouraged from acquiring and utilising skills related to entrepreneurship, while young men were discouraged from involvement in agriculture at all. That training might have a role to play in challenging these community-prescribed social roles has rarely been considered in skill ecosystem research or in skill policy.

Third, informal sector skill ecosystems are marked by significant inequalities which are produced not only by social role prescriptions but also through discrimination, marginalisation, and the unequal distribution of social capital (Carswell & De Neve, 2018). Previous research has shown that in the global South, personal connections and privileged social networks are often critical both in acquiring skills and securing benefits that may enhance skill utilisation, such as getting a loan or subsidy approved (Rao, 2018; Raghuram, 2021). In this study, privileged access to social networks enabled trainees to access the beneficial features of skill ecosystems – particularly in receiving support from government departments, banks, local services, and training providers. That such networks are, in India, largely accessible to men from privileged castes goes some way in explaining why individuals from these demographics generally found their social and institutional environment to be more enabling of their skill development and utilisation than did younger trainees, women, and members of lower castes (see also Raghuram, 2021). Although previous research has identified how dense social networks enhance skill ecosystems' functioning (Finegold, 1999), the findings of the present study suggest the need for

more consideration of how the distribution of these networks may perpetuate inequalities. Overt discrimination – by market agents, government officials, or customers – though less frequently observed in this study, created some barriers to skill utilisation for those who experienced it. Greater consideration of how skill ecosystems are imbricated within systems of social inequality and power may lead not only to higher levels of skill utilisation but also more equitable outcomes.

These findings not only point to necessary adaptations to the skill ecosystem concept for application in the global South, but also draws attention to questions of inequality that should feature more prominently in research on skill ecosystems and geographies of skills in the global North. Skill ecosystems research began with a focus on relatively elite sectors and spaces (Finegold, 1999). Yet, research suggests that skill underutilisation is a problem that affects women and minority groups in the global North disproportionately (Rafferty, 2020). A more expansive conception, sensitive to inequality and power, could be leveraged to consider the conditions under which skill development might facilitate inclusive development and positive social transformation.

6. Conclusion

Research in geographies of skills has shown how skills require enabling environments to disseminate and find pathways to utilisation (Lea, 2009; Patchett, 2017; Mann, 2018). The concept of skill ecosystems draws attention to the specific social and institutional conditions that make such dissemination possible (Finegold, 1999; Hall & Lansbury, 2006). The findings of the present study reiterate the value of context-sensitive approaches to skills for both theory and policy: although the quality of training was important, its impact on skill utilisation hinged on whether the environment provided the materials, markets, and socio-economic supports necessary for skills to be enacted, remunerated, and valued. A human geography perspective can enhance the skill ecosystem perspective by emphasising that these environments are dynamic, relational, and power-inflected – changing in response to both macro- and micro-political projects (Richardson & Bissell, 2019). As argued above, analysis of such environmental factors in the global South – where economic informality, precarity, and inequality powerfully shape prospects for skill utilisation – requires an expanded skill ecosystems concept that is attentive to: (1) institutions and actors that facilitate or constrain skill utilisation in small-scale informal enterprise; (2) the family and community contexts in which informal sector skills are enacted; and (3) the substantial social inequalities that mark those contexts.

An expanded skill ecosystem concept can provide a powerful guide for policy and practice. Skill ecosystems researchers have noted the importance of coordination between multiple actors to maximise opportunities for skill development and utilisation (Lotz-Sisitka, 2019; Hodgson & Spours, 2013; Spours, 2019; Wedekind et al., 2021). The findings presented here reinforce this and highlighted the potential role of trainers in facilitating connections between trainees and other actors. Given their important linking function within skill ecosystems, there are potential benefits in giving trainers greater representation within skills planning and providing them with

resources to work with different actors to improve trainee outcomes. Yet, as the research findings showed that middle-aged, upper caste men had more positive relations and received greater benefits from trainers than others, there also needs to be a focus on challenging injustices in access to trainers and the benefits they confer. Moreover, in recognising that trainers are not equipped to address all problems of skill ecosystem integration, strategies need to be explored for integrating skill ecosystems at broader scales.

The substantial variations in outcomes of skill training between the two neighbouring states of Himachal Pradesh and Punjab highlighted the regional variations in skill ecosystems and subsequent need for regional-level skills strategies. As economic geographers have stressed, development strategies must be formulated with the regional social and institutional context in mind (Rodríguez-Pose, 2013). Such strategies should see skills as inseparable from a range of other regional development challenges – including improvements to infrastructure and services, and access to markets and finance – and consider regionally salient inequalities. In forming regional skills strategies there is great potential for collaboration between policymakers and engaged skills researchers in geography and related social sciences. An expanded, more socially and geographically sensitive version of the skill ecosystems concept may provide a useful framework to guide such engagements.

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