Vocational Training, Extension, and the Changing Landscape of Agricultural Education in India

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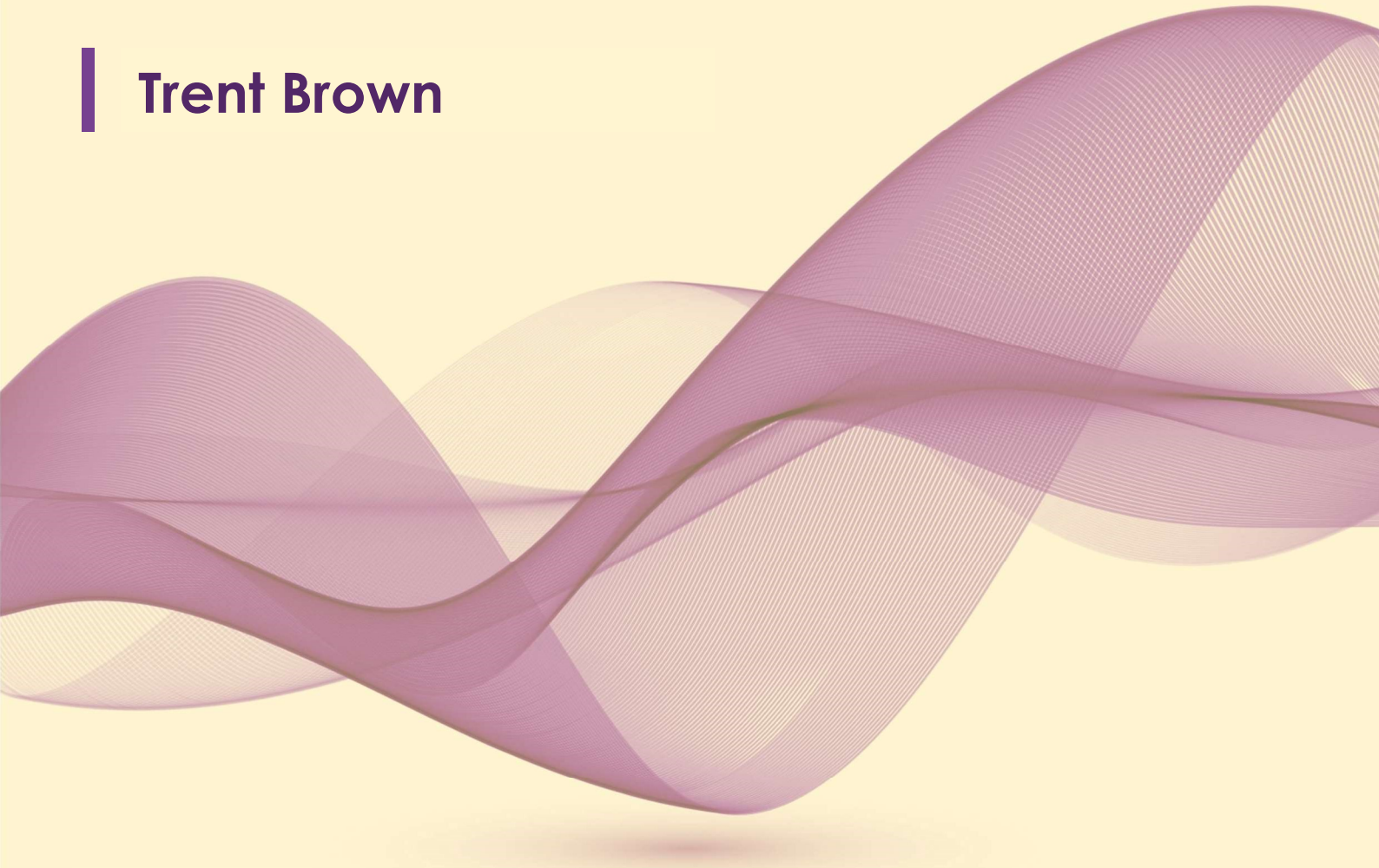

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Abstract. Since 2013, India has been introducing new, nationally standardised agricultural vocational training programmes, as part of the broader Skill India initiative of vocational education reform. Yet, given a dearth of existing specialised vocational education centres capable of providing agricultural training, India has been relying on other institutions to implement training at the ground level, notably institutions of agricultural extension. This has given rise to several tensions, as agricultural vocational education and agricultural extension proceed from different assumptions. In the course of conducting fieldwork involving 102 interviews with trainers and trainees and direct observation of training programmes in North India, three key sources of tension were identified. These related to (1) the importance of practical learning; (2) suitable durations for training programmes; and (3) the relevance of centralised planning. Investigating these three tensions sheds light on the need for alternative institutional and pedagogical approaches to agricultural education to meet the needs of rural communities in contemporary India, and the global south.

Keywords. Agricultural extension, technical and vocational education and training (TVET), agricultural education, skill development, practical learning, India.

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1. Introduction

Over the last two centuries, states have adopted a variety of approaches to farmer education. These approaches have shifted historically in terms of their scope, level of funding, institutional structure, and pedagogical strategies – often in response to broader social, economic, ideological, and agroecological change (Rao, 2005; Hunt et al., 2012; Anderson et al., 2006). In this paper, I consider whether recent policy reforms in skill development and vocational education in the global South may facilitate further shifts in the modalities of farmer education. With a specific focus on India, I show how recent efforts to introduce agricultural vocational training programmes relate to an existing system of agricultural extension and consider the implications of this for the future evolution of farmer education systems. I consider whether this new programme serves as a departure from a history of top-down, overly theoretical pedagogical approaches that have historically characterised agricultural education in India and elsewhere in the global South (see Vasavi, 2000).

In the global South, agricultural extension has been a major component of farmer education. Established during the colonial period and expanded significantly as part of Green Revolution development strategies in the 1960s and 1970s, agricultural extension services seek to connect farmers with agricultural scientists, generally with the aim of improving farm output and farmers' profits. Often, they are institutionally linked to state agricultural departments or government-funded agricultural universities. As a modality of farmer education, extension generally consists of experts making visits to farmers' fields or hosting targeted short-duration training programmes to advise farmers on scientific agricultural practices or to address pressing local agroecological problems.

Throughout much of the Twentieth Century, states in the global South invested fewer resources in more comprehensive approaches to farmer education.[1] This was in contrast to many countries in the global North, which established agricultural colleges and vocational training centres since the Nineteenth Century to provide aspiring farmers with comprehensive knowledge and skill development (Field et al., 2000). In the global South, the neglect of agricultural vocational training has perhaps reflected a belief that farmers are already embedded in agriculture since childhood and hence not in need of comprehensive development of foundational agricultural skills. Moreover, states often lacked the resources to establish dedicated agricultural training centres – extension was a more targeted and efficient way of enhancing farmers' skills.

This, however, has begun to shift, reflecting broader reforms to Technical and Vocational Education and Training (TVET). TVET encompasses the formal educational and training institutions responsible for imparting both theoretical and practical competencies required for success in relatively technical working-class jobs (Powell & McGrath, 2019: 2-3). While TVET institutions are reasonably well-developed in the global North – often recognised as an important, more practice-oriented alternative to academic post-secondary education – in the global South, they had historically been neglected. Where vocational education did exist – such as in India's

[1] There were, however, significant investments in university-level agricultural education, which provided degree programmes (see Mehta et al., 2017). Students of these programmes would largely go on to work as agricultural scientists, public servants, or in private agribusiness firms.

network of Industrial Training Institutes (ITIs) – it was characterised by under-investment, outdated curricula, and weak links to industry (Pilz, 2016). As such, practical, vocational learning mostly occurred in informal settings. Over the last two decades, several countries in Africa and Asia have attempted to reform and upgrade their TVET systems, often in the hope that developing a sizable skilled workforce with certified qualifications will help attract foreign capital (King, 2011; Mehrotra et al., 2014; Powell & McGrath, 2019).

As part of this process of reform, some countries in the global South are seeking to incorporate agriculture within their broader TVET systems. The African Union, for example, is implementing a scheme to develop formal agricultural TVET programmes in key agricultural supply chains of 12 member countries.[2] Countries in Southeast Asia have developed both short- and long-duration diploma programmes aimed to prepare young people to enter into knowledge- and capital-intensive forms of agriculture (Filloux et al, 2019; Ulimwengu & Badiane, 2010). This paper explores similar new programmes that are being introduced in India. As part of a wide-ranging agenda to reform its TVET sector, India has developed a series of modularised training programmes covering a comprehensive array of job roles within the agricultural sector. This is significant, as until the introduction of these programmes, India did not have a nationally standardised system of agricultural TVET. Critics, however, have questioned what TVET programmes can contribute in the agricultural sector that cannot be addressed through existing institutions and schemes. For example, Mehrotra et al. (2014) suggest the problems of India's agricultural sector relate to a lack of timely availability of inputs and information, which can be best addressed through reform and investment in the country's agricultural extension system.

This paper explores what a pivot towards agricultural TVET might mean for the evolution of systems for farmer education in India and the global South. If TVET is to play a greater role in farmer education, there is a need to delineate what kind of roles it may play vis-à-vis existing extension systems and whether the two systems can complement each other to improve rural livelihoods. Contemporary India provides an excellent case study to explore these themes. India's efforts to upscale its capacity for agricultural vocational education have been limited by a paucity of institutions with the human capital or infrastructure to deliver specialised vocational training. This has led to a reliance on other institutions with expertise in farmer education to administer training – and particularly government institutions of agricultural extension. This contrasts with the approach taken in most other countries, where agricultural TVET is administered by the same institutions that administer TVET programmes for the industrial and service sectors. While the curricula and pedagogic structure of India's new agricultural vocational training programmes have been designed according to a TVET framework, extensionists have the role of delivering them in a form that they believe will work on the ground. This gives rise to tensions, as TVET and extension have different assumptions regarding pedagogical strategies, appropriate administrative procedures, and the imagined beneficiaries of their interventions. India's attempt to administer agricultural vocational training schemes through the institutions of agricultural extension, and enlisting extensionists as trainers, spotlights how the two systems are different – and the particular roles that each might be best suited to play in farmer education in the Twenty-first Century.

[2] For an overview of the scheme, see https://www.nepad.org/programme-details/1013

The research informing this paper interviewed extensionists enlisted to administer these vocational training programmes and enrolled trainees. This enabled an exploration of the suitability of vocational training and extension as modalities of farmer education in addressing contemporary rural challenges. Extensionists questioned and, in some cases, resisted aspects of the vocational training scheme, as they were at odds with their disciplinary training and professional experience as extensionists. Yet, the experience of trainees often showed that there indeed were ways in which the new TVET modes of farmer education might be beneficial when compared to traditional extension methods – at least for some categories of trainees. This paper explores three major sources of tension which emerged regarding the differences between the two systems – regarding course duration and scheduling, practical learning strategies, and centralised planning mechanisms – and reflects on what they might mean for the evolution of suitable institutional and pedagogical approaches to farmer education for the global South in coming years. I begin, however, by outlining the historical evolution of institutions tasked with farmer education – particularly extension services – highlighting how their assumptions have developed over time. I then outline India's new agricultural vocational training scheme, its methods of implementation, and guiding assumptions, before moving onto the specifics of the present study and its findings.

2. A Brief History of Agricultural Education in India and the Global South

While both historically and in the present, 'agricultural education' in India has occurred predominantly by informal means in the family and community, the development of formal systems of agricultural education began in the late colonial period. After a series of severe famines in the late nineteenth century, the colonial administration in 1905 established the Imperial Agricultural Research Institute, and later the Imperial Council of Agricultural Research in 1926. It was envisioned that these institutions would serve not only to advance agricultural research, but also to enhance the capabilities of farmers and improve agricultural production – though there is limited evidence that this was achieved (Rao, 2005). After India's Independence, these institutions were transferred into Indian hands – now as the Indian Council of Agricultural Research (ICAR). In the early years of the newly formed nation, these institutions were tasked with overcoming chronic food shortages by guiding farmers towards more productive techniques. ICAR was supported financially and through technical expertise by aid and philanthropic organisations from the United States. When representatives of these organisations visited India, they identified the lack of agricultural extension services as the 'weak link' preventing growth in agricultural output and guided the formation of institutions capable of linking farmers to the latest agricultural science and technology (Siegel, 2018: 190-196). They helped establish agricultural universities in the 1960s, each with extension wings capable of disseminating scientific knowledge to farmers. There were initially eight such universities, but they have multiplied since, with now at least one in every state of India and several states having two or more. Recent years have also seen the emergence of private agricultural universities and colleges.

During the Green Revolution of the 1960s and 1970s, India, like many other developing countries, leveraged extension services to provide awareness of new agricultural technologies and to advise farmers on the judicious use of chemical inputs. This was taken as evidence of the 'modernising'

potential of extension (Axinn & Thorat, 1972). As an institution of agricultural education, extensionists operated in a more-or-less top-down manner, bestowing their scientific agricultural knowledge on rural communities. Critics have noted the disruption that this top-down imposition of expertise created to indigenous modalities of agricultural skills transfer, which were more flexible and adapted to local ecology (Vasavi, 2000).

By the 1970s, yield gains from the Green Revolution had levelled out, raising questions about appropriate mechanisms for agricultural education moving forward. Critics argued that extension services were not capable of helping farmers overcome contemporary challenges, since they lacked mechanisms to receive feedback from farmers about the usefulness of their interventions (Benor et al., 1984). These critiques led to the development of new models of extension that encouraged greater engagement between extension workers and farmers, notably, the 'Training and Visit' (T&V) model, developed and promoted by the World Bank in India and other developing countries during the 1970s. The model (outlined in Benor et al., 1984), entailed the employment of 'Village Extension Workers' (VEWs), intensively trained staff members whose exclusive role was the provision of extension to a specified number of farming families. The VEW would regularly visit villages, where they would connect with a select number of 'contact farmers' who would be local conduits for agricultural science.[3] Some evidence suggests the T&V extension model, when implemented in full, had significant impacts on farm outputs (Feder & Slade, 1986). Yet, across most of India, the programme was only implemented partially – staff adopted only what they felt workable, leading to sub-optimal outcomes (Moore, 1984). This, combined with the high expenses associated with T&V, resulted in India, along with most other countries, withdrawing its commitment to this form of extension soon after the World Bank withdrew its financial support (Anderson et al., 2006). And yet, many of the assumptions of T&V live on within India's extension system, particularly the value of having staff devoted exclusively to extension and the value of regular contact with farmers.

Since the late 1980s, there have been tendencies towards decentralization within India's institutions for agricultural education. Within India's public sector extension agencies, consensus emerged that the prior form of government-led extension was too 'top-down', with extension workers being more accountable to governments than to farmers. Hence, in the 1990s, the Government of India, in partnership with the World Bank, implemented measures to decentralise the planning process for extension services, such that farmers and private sector organisations at the district level would be consulted to develop extension programmes that reflected local needs (Singh et al., 2006; Glendenning & Babu, 2011). By the early 2000s, the call was to make extension more 'demand driven' – and particularly, more responsive to the demands of women and marginalised communities for new skills (Birner & Anderson, 2007). These developments in India were a response to critiques that had been prominent in the global development community since the 1980s, which stressed the need to make extension more participatory, by shifting from pre-

[3] Maintaining a 'contact farmer' remains an important modality of contemporary agricultural extension – though now often referred to as a 'model farmer' who, it is imagined, will also be an exemplar of agricultural innovation for their community (see Taylor & Bhasme, 2018).

scripted training programmes to those in which farmers had significant input regarding the focus, structure, and duration (Chambers & Ghildyal, 1984; Farrington, 1995; Rogers, 1996).

Over roughly the same period, a variety of new actors entered the space of agricultural education, significantly diversifying the institutional landscape. NGOs have played more prominent roles in agricultural training, particularly in developing skills that they regard as having social and environmental value – such as in sustainable farming (Brown, 2018). Private sector organisations are also more directly involved in the provision of agricultural training, though questions have been raised on their efficacy (Kidd et al., 2000). Private provisioning takes the form of both agri-procurement and agri-processing companies providing training programmes as a component of contract farming (Swain, 2016), or agri-chemical retailers providing training on suitable chemicals to use for particular crops (Aga, 2019). In both cases, private-sector organisations often use the term 'extension' to describe their activities and adopt methods of engagement with rural communities that draw on agricultural extension discourses.

Currently, there are two main systems for public extension services in India. The first comes under the state-level Departments of Agriculture, sometimes referred to as 'frontline extension.' The nature of these services varies between states, though in most cases they are chiefly involved in the transfer of technology, and staff involved in extension may also have responsibilities for the administration of other rural development schemes. Frontline extension is mostly top-down in nature and has limited linkages to research. The second public system is overseen by ICAR, which functions as a relatively autonomous organ of the central government. This institution coordinates a system wherein extension programmes – largely consisting of short-duration trainings – are administered by agricultural research stations, agricultural universities (each of which has a Directorate of Extension) and Krishi Vigyan Kendras ('Agricultural Science Centres', hereafter KVKs), which are district-based institutions, primarily focused on the delivery of extension. Within the ICAR extension system, there are some mechanisms in place to ensure the two-way flow of information between extension services and agricultural research, and to elicit feedback from farmers on the relevance of extension programmes (for an overview, see Glendenning et al., 2010: Chapter 4).

3. India's New Agricultural TVET Scheme

The initiative that forms the focus of this paper may represent a further shift in the landscape of farmer education in India. It introduces a TVET model to farmer education, which unsettles some of the more problematic assumptions and entrenched (though much-critiqued) practices of extension. The initiative forms part of the 'Skill India' mission. Since 2006, the Government of India has sought to reform its TVET sector which had until then been characterised by outdated curricula, poor infrastructure, and weak industry linkages (Mehrotra, 2014; Pilz, 2016). Reforms have entailed upscaling the number of TVET institutions, revising curricula in alignment with industry demand, and improving systems of qualifications recognition. Sector Skills Councils (SSCs) were formed for each major sector in the economy – there are currently 37 – which provide a forum for industry representatives to guide reform and ensure that vocational qualifications align

with industry demand for skilled labour. These moves accorded with an emergent 'orthodoxy' on TVET reform, which stresses that to improve employment outcomes, the structure and content of training programmes should be informed by industry, rather than public sector bureaucrats (Powell & McGrath, 2019). The overarching objective of TVET reform is to improve productivity and employment outcomes (King, 2012; Mehrotra, 2014) though, in the agricultural sector, other objectives are recognised alongside the need to increase productivity. The Ministry of Skill Development and Entrepreneurship (2016) notes the need for new skills to cope with changing dynamics associated with rural outmigration and environmental challenges, as well as entrepreneurship skills to adjust to changing economic conditions. It is also hoped that by taking on more specialised roles in the rural sector, rural youth can realise opportunities for more remunerative livelihoods.

The SSC overseeing the introduction of new TVET projects in agriculture is the Agriculture Skill Council of India (ASCI), which was formed in 2013.[4] It has three key mandates. The first is to identify the skills needs of the agricultural sector and formulate 'qualifications packs,' which outline key occupational standards and skills to be imparted through training, and model curricula, which recommend a syllabus and set of pedagogical approaches to address them. At the time of writing, some 176 'qualifications packs' had been developed, relating to everything from agri-crop production, animal husbandry, and allied activities, through to more service-oriented qualifications such as tractor mechanic, irrigation technician, extension service provider, and commodity management.[5] Each of these 'qualifications packs' has some focus on entrepreneurship and other 'soft skills' but the main focus is technical skills. Second, ASCI is to provide accreditation of agencies capable of delivering training for these 'qualifications packs', ensuring that they have the relevant infrastructure and expertise. Third, ASCI oversees the processes of assessing and certifying trainees' skills.

One of the challenges that ASCI faces is that, whereas in other sectors it is possible to upgrade and upscale an existing set of TVET institutions, in the agricultural sector, no such institutions exist. Rather than establishing new agricultural TVET institutions – as is being done, for example, in the African Union's agricultural TVET initiative – ASCI has partnered with other institutions which, though not formally TVET providers, are nonetheless experienced in farmer education, including both public and private sector providers. Private providers consist of rural development NGOs, social enterprises, agribusiness firms, and private training agencies. These providers have registered with ASCI, who have certified that they are capable of providing training for one or more 'qualifications packs'. At the time of research, however, almost all private training providers who were contacted about their involvement with ASCI stated that they had not yet found a

[4] In publicly available documents, ASCI rarely describes its programmes as 'TVET' but rather as 'skill development'. For the sake of terminological clarity, the term TVET has been used to describe its programmes since 'skill development' is a broader term, which could be applied to a range of activities, both formal and informal, including agricultural extension. Given that ASCI operates within a TVET framework (with an emphasis on imparting both theoretical and practical competencies through standardised training), develops a national system of qualifications recognition, and links to India's broader TVET reform agenda, referring to its programmes as 'agricultural TVET' is not controversial.

[5] For a complete list of ASCI's qualifications packs, see http://www.asci-india.com/National%20Occupation%20Standards.php

workable business model for implementing ASCI's training programmes, often due to a perceived lack of youth interest in agricultural training. It seemed the majority of training programmes were, therefore, being undertaken by public providers. These providers were also diverse – including government agricultural research institutes and more than 30 government colleges who were providing ASCI-approved diploma and degree programmes related to the practical aspects of agriculture. The majority of trainings, however, were being imparted by publicly-funded extension service providers – specifically agricultural universities and KVKs. While colleges and schools may deliver agricultural vocational courses over an extended period of time, agricultural universities and KVKs provided more modularised trainings of between 150 and 300 hours in duration, with each training programme covering material related to one specific agricultural job role (such as 'wheat cultivator', 'dairy entrepreneur', or 'tractor operator'), as outlined in ASCI's 'qualifications packs'.

Through these various innovations, the ASCI scheme introduces a new modality of agricultural education to India, more informed by discourses on TVET. Since it is largely implemented by extension service providers, however, these new modalities and discourses are interpreted and translated according to extensionists' assumptions of 'what works' in farmer education and training – assumptions informed by their training in extension education and their professional experience. Although there is reason to believe that a TVET approach may introduce a welcome disruption to extension's teaching modalities – for example, extension has long been criticised for its lack of attention to practical pedagogical strategies (Farrington, 1995) – for this to be productive, extension providers would need to be engaged in meaningful dialogue about the need for change. This does not appear to have occurred in the ASCI scheme, except for a brief 'training of trainer' programme. Prior research suggests that extensionists tend to eschew one-size-fits-all models of 'best practice' in farmer education in favour of more versatile and locally adapted approaches (Landini, 2016). Thus, when imposing models of 'best practice' that are not even entirely congruent with their professional training, one might expect the scheme to encounter some forms of resistance from training providers – and this is indeed what has occurred, as demonstrated below.

4. Research Methods

The research that informs this paper was conducted between October 2018 and March 2020. It took place at seven training centres in the North Indian states of Punjab and Himachal Pradesh and was part of a broader study investigating the nature and impact of the ASCI scheme. Training centres consisted of agricultural universities and KVKs. The two states chosen, though geographically adjacent, are very different in agrarian structure. Punjab has a long history with commercial and capital-intensive agriculture, while Himachal Pradesh is a mountainous state, where farming is more subsistence-oriented, and often practised alongside other forms of wage labour and non-farm entrepreneurial activities. The two states therefore offered a meaningful contrast which captures some of the diversity of rural India.

Data consisted primarily of interviews and direct observation of training programmes. 20 interviews were with trainers and administrators who were trained extensionists, enlisted to implement ASCI trainings. Interviews with trainers focused on their evaluation of the ASCI scheme and approach to implementation, including challenges they had encountered and their thoughts on how the scheme could be improved. In addition to this, 82 interviews were conducted with trainees, which focused on their reasons for enrolling, their experience and evaluation of the ASCI training programme, and their plans after completing training. Some direct observations were also made of the ways in which ASCI training programmes were being conducted, including both theoretical lectures and practical lessons. The ASCI training programmes observed were for job roles in crop production, animal husbandry, and 'allied activities' (for example, mushroom cultivation and beekeeping). In a small number of cases, trainees were visited at their home villages to gain a better appreciation of the context in which they were developing their skills.

These initial interviews and observations took place in late 2018 and early 2019. In late 2019 and early 2020, follow-up interviews were conducted with the initial trainees, in order to better understand the impact of training. Follow-up interviews with some of the initial trainers were also undertaken, to gain insight into how the ASCI scheme was evolving and to elicit further reflections from them on how the scheme could be improved.

In the course of analysing trainers' and administrators' evaluations of the ASCI scheme, a list of several objections to the scheme were identified. Of these, at least three were reducible to the fact that their assumptions as extension providers came into conflict with the TVET assumptions guiding the ASCI scheme. These objections, however, needed to be qualified through reference to the sentiments trainees expressed in interviews. While in some cases trainees may have agreed with their trainers' assessment of the ASCI scheme, in other cases, aspects of the ASCI scheme to which trainers objected most were precisely the aspects valued most by trainees. These three objections are thus presented here as three core tensions between extension and agricultural vocational training as modalities of agricultural education.

5. Findings: Tensions between TVET and Extension

Given the lack of existing agricultural TVET institutions, India's agricultural extension institutions were logical partners for the implementation of ASCI's qualifications packs. Extension staff saw themselves as qualified to implement the ASCI scheme, given their expertise in both agricultural science and strategies of engaging with rural communities. However, they also questioned some of the assumptions of the ASCI scheme – and the TVET discourses that informed it – regarding the appropriate means to plan and implement training, and the ultimate purpose of training. This gave rise to various sources of tension in the administration of ASCI's TVET scheme, three of which are presented below.

5.1. Practical, Hands-on Learning

The most critical source of tension concerned the salience of practical, hands-on learning. ASCI's 'qualifications packs' and model curricula dictate that the course duration be divided between theoretical and practical training. The proportion of practical hours varies between courses but approximates 50 per cent in most cases. Yet, largely due to their background as extensionists, trainers questioned whether it was necessary to devote so much time to practical classes and encountered challenges when they attempted to do so.

It has become a standard assumption in TVET that trainers should have both industry experience (in this case, experience in agriculture) and some qualifications in vocational pedagogies (Attwell, 1997). These provide trainers the necessary capabilities to demonstrate, through practical learning strategies, the challenges that trainees will face on the job. India's extension service providers, by contrast, are academically trained – most of those working in KVKs or agricultural universities have PhDs in agricultural or veterinary science. They may have studied 'extension education' at some point while acquiring their degrees, but this is not the same as pedagogical training. Indeed, it is a long-standing observation that the academic and theoretical nature of extensionists' education and training makes them ill-equipped to impart skills to farmers through practical, participatory modalities (Rogers, 1996). My engagement with extensionists suggests that their standard modalities of imparting skills consisted of hosting short-duration, largely theoretical workshops and meetings with farmers at the training site. A few of the more dedicated trainers conducted field visits to provide feedback to farmers regarding their practices. In terms of industry experience, while several of the trainers interviewed for this research came from farming families and had some degree of hands-on experience in agriculture, this was largely incidental. They had gained their posts as a consequence of their academic qualifications – not their experience in farming.

My observations of extensionists' approach to running ASCI courses showed that while they were comfortable with administering lectures – which were closer to their own educational experience – they faced challenges in administering practical classes. Most had less direct, practical experience with agriculture than their trainees. Consequently, they had doubts about what they could offer as practical trainers. Some suggested that because trainees had, in many cases, been involved in 'hands-on' learning since childhood, attempting to teach them in this manner was redundant. For extensionists, the practicing farmer – the imagined beneficiary of their interventions – is thought to be already skilled, but ignorant, standing to benefit more from enhanced knowledge of agricultural science and technology, rather than practical, vocational learning. Consequently, practical teaching strategies were often overlooked in the administration of the ASCI scheme. What tended to occur in the name of 'practicals' were field visits to farms of those who had established commercial ventures (often at a scale well beyond what trainees had the finances to achieve) at which trainees had the opportunity to observe the application of skills *in situ*, but not to directly apply and practise those skills themselves. Job placements – a core component of vocational education and training in the global North – were absent in the training programs that I observed.

Yet, extensionists' assumption that 'hands-on' learning would not be valuable did not accord with the accounts of some trainees. While trainers assumed that trainees already had 'hands-on' learning experience, interviews with trainees revealed this was not always the case. Take the example of Harshit.[6] Harshit was a young man in his mid-20s who described himself as unemployed. He was living with his family who ran a textiles business in a small urban centre. After dropping out of high school in class 11, he had tried moving to a larger city in search of work, but found the work to be exploitative, with demanding work conditions and little pay. He also tried working with his father in the family business but said there were differences of opinion ('*anban ho jati hai*') between himself and his father and attempting to manage a large amount of staff proved too challenging. Instead, he decided it would be better if he could 'work for himself', taking inspiration from his uncle, who was running a small-scale dairy business. Agricultural work seemed to offer him the kind of personal independence he was craving, and in dairy – compared to other agricultural ventures – he felt there was scope for the business to become profitable. Yet, he had no previous experience working on a farm – all that he knew came from conversations with his uncle. He needed basic knowledge and skills before starting a venture of his own. So Harshit approached the local agricultural university, who told him about an upcoming ASCI 'dairy entrepreneur' course they would be running, which would cover everything required to start a small business in the dairy sector. Harshit immediately asked to be enrolled.

Harshit attended the course daily and his overall impression was positive. He felt he had learnt a lot. Yet, he did note that the course seemed overly theoretical. Trainees would spend much of their time being taken from one department of the university to another, where they would receive lectures from experts on different aspects of work in the dairy sector. Harshit struggled to pay attention in these lectures. He tried to take notes, but could not picture in his mind exactly what they were talking about, since he had limited practical experience working with cattle. He worried that after completing the course he would still not know how to respond in the event of an unexpected development, such as an outbreak of disease. He ultimately needed to see and do the work himself. He therefore made arrangements to spend some time working with his uncle on his dairy farm, where he would be able to gain some practical experience in dairying under his supervision. He anticipated that it would take a further eighteen months until he would be ready to start a venture of his own. Harshit was not alone in this respect – a year after completing training, many others expressed the view that their 'practical learning' only occurred in the fields after training was over – and significant failures often became their greatest teachers.

Tensions surrounding whether and how to include practical, hands-on learning are partly explained by the fact that extensionists imagine their core beneficiaries differently than does TVET. Extensionists recognize practising farmers as core beneficiaries, and not less experienced people, like Harshit, who are hoping to start a new enterprise. 35 of the 82 trainees interviewed were in a similar position to Harshit, having limited prior experience in agriculture. There were also several others who were either coming back into agriculture after time spent working in other sectors, or who were entering a new agricultural venture in a field in which they had limited prior experience.

[6] This is a pseudonym, as are all names given to research participants mentioned in this paper. Minor details of participants' stories have been altered to protect their anonymity.

These participants also expressed the importance of practical classes. Moreover, several trainees who had not been in school for several years said they mentally retained more of what they learnt in practical classes than they did in theoretical lectures (during which, in my observations, very few trainees took notes). For example, one woman in her late 20s who had completed class 10 explained her preference for practical classes as follows:

> This is my first time coming for training. So I'm not in the habit of writing – and I've almost forgotten everything [taught in lectures]... It's been 8-9 years since I left school.

While Harshit interpreted his need for more practical, hands-on learning in terms of his own deficiency (his lack of any prior experience in animal husbandry), other enrolled trainees in the same course who *did* have practical experience in the dairy sector also expressed disappointment over a lack of adequate practicals in the training programme, stating they wanted to learn more by hand ('*hath se seekhna*'). They said that what trainers called 'practicals' were mostly field visits, which one of them described as visual demonstrations of theory. They never had an opportunity to learn by doing – and this they wanted, particularly in areas where they hoped to develop new technical skills. For example, given the high expense of veterinary services, several experienced dairy farmers wanted to learn how to perform tasks such as administering vaccines by themselves. One trainee made special note of this, stating that it would have been beneficial if they had the opportunity to administer vaccines under the supervision of the trainer, and receive feedback on their technique. At best they were given a demonstration of how to administer a vaccine followed by an opportunity to ask questions.

A small number of trainers also acknowledged the lack of practical pedagogical methods within extension as a problem. One trainer spoke emphatically of the value of ASCI's modules in encouraging them to provide more opportunities for practical skill development. Yet, when they did attempt to provide opportunities for practical learning, the design of practical classes seemed ill-conceived. There were limited opportunities for participatory learning, such that these classes were unlikely to lead to effective skill acquisition. Part of the problem was that trainers lacked clear models of how to design practical classes effectively. Notwithstanding Gandhi's exhortations that India needed a model of education based on experiential learning, India's education system has long neglected practical and vocational pedagogies (Singh, 2001). Research on India's vocational education system has found that vocational teachers often lack a clear conception of the value of practical classes, viewing skills as something one is born with, rather than something that can be taught (Pilz, 2018). Channelling a TVET programme through institutions of agricultural extension only exacerbated this problem. It was apparent that most extensionists imagined themselves as being engaged in the transfer of knowledge, rather than the provision of practical opportunities for skill development. This significantly undermined the potential of the ASCI scheme to introduce a more practical approach to agricultural education.

5.2. Duration and Scheduling

Tensions were even more pronounced over questions of course duration and scheduling. Most trainers believed that the hours required for most ASCI 'qualifications packs' were excessive.

Although the 150-300 hour courses offered by ASCI were far from the 3-year diploma courses in agriculture that are common in the global North, they were, nonetheless, considerably longer than normal extension programmes. Trainers whom we interviewed were more accustomed to providing courses that lasted 1-7 days, which may only consist of afternoon classes or a few workshops per day. Most ASCI courses required 3-6 weeks of full-time training – 8 hours per day, 5-6 days per week.

A small number of the trainers interviewed recognised benefits in longer-duration training. For example, one trainer noted the longer courses only attracted highly motivated trainees – where short-duration training programmes attracted those who were merely passing time. Having more 'motivated' students opened possibilities for more comprehensive learning:

> [F]or seven-days' programmes anyone will come. They will come for an *outing*. And maybe all the persons who attend the training, they were not sincere or they were not very confident that they will [practice what they learn]. But when persons are spending some 25 or 30 days, I think we will be able to sufficiently motivate them, or they get a better picture... I think that is the biggest strength of this programme.

Yet, many more trainers were concerned that the longer duration trainings would not be effective. Indeed, even those who made positive comments about the potential of long-duration trainings to encourage more comprehensive skill development noted that it would not always be appropriate to do so. One senior trainer, for example, contended that while it is good to have a month-long course in some technical activities, like mushroom cultivation or animal husbandry, the same could not be said of some of the less technical domains in which ASCI was offering courses, like vegetable or wheat cultivation.

The majority of comments from trainers were more derisive. Not only did they feel that 150-300 hour courses were unnecessary, but also that they were counter-productive. 'Farmers don't have so much time to waste on training programmes!' one trainer asserted, reflecting a common view that, given the busy schedules of practising farmers, full-time attendance of a 3-6 week course was too much to ask. Trainers seemed anxious that they would not be able to sustainably recruit trainees to participate in such courses and there was an ever-present concern that even those who had enrolled would drop out when they learnt of ASCI's attendance requirements. In response, some trainers were putting in extra work to ensure there were novel activities each day in order to sustain trainees' interest, believing that if they did not do so, trainees would withdraw their enrolment. Some criticised the duration of programmes as an equity and inclusivity issue, noting that women or small-holding farmers would be less likely to attend longer-duration programmes, given that they need to manage various other tasks, including domestic labour (in the case of women) and off-farm employment (in the case of small-holding farmers). This reflected a longstanding tradition in extension – particularly since the 'participatory turn' – of consulting with programme beneficiaries about the time and duration of training and ensuring that it is suitable to their schedules (Rogers, 1996; Birner & Anderson, 2007).

One of the KVKs at which the research was conducted exemplified this concern over course duration. Staff at the KVK had become frustrated with the ASCI scheme, believing that the long-duration courses were not workable, for the reasons outlined above. Therefore, those coordinating

ASCI programmes at this KVK overlooked the requirement of a fixed number of hours of training. Instead, trainers offered an intensive schedule of lectures in the first week of the programme, and thereafter would call in farmers for a focused series of workshops, practical trainings, lectures, and field visits, which tended to be for half a day, once or twice per week. Even then, it appeared to be difficult to motivate farmers to come on these days – a considerable portion of trainers' time was spent on the phone, rallying trainees and convincing them it was worthwhile attending. Based on a rough estimate, it appeared that in this particular course, less than a quarter of the hours ASCI had mandated were actually being spent on face-to-face classes.

While these trainers' actions may at first glance appear negligent, it is noteworthy that in some respects these trainers were *exceeding* the requirements of the ASCI scheme to ensure their trainees were successfully implementing what they had learnt – often in ways that conformed with ideas of how a good extensionist should behave. One trainer of a mushroom grower course, for example, would make regular visits to the homes and farms of his trainees, to see first-hand the kind of challenges they were facing in growing mushrooms and providing them suggestions on what they could be doing better – according in many respects with the 'training and visit' model of extension (Benor et al., 1984). These visits were a considerable investment of time on the part of the trainer and could be quite motivating for trainees, who valued that their trainer had taken the time to visit and advise them on how to address their problems.

Yet, a follow-up interview with one trainee, Pratik, who had received such visits, challenged the trainer's assumptions about trainees' needs. The trainee was from a marginalised caste, did not own any land, and was 29 years of age. He did odd jobs at local temples which earned him enough money to be slightly above the official poverty line. After the birth of his daughter, however, it became apparent that he would need further sources of income to provide for his family. Mushroom cultivation seemed an attractive option as a business activity he could do from home, without needing farmland. He approached the local KVK and enrolled in a 5-day training programme that they offered in mushroom cultivation, as part of their regular extension services. This training, he said, provided only a very basic overview. Five days was, he said, in no way adequate to give one the confidence to start a new venture growing mushrooms. He said that to learn the required skills, one needed *at least* a month of training, and that training should include opportunities to make compost on site, observe how others do it, and receive feedback on one's mistakes. It required a dedicated amount of time under a mentor, under whom one could develop confidence to start their own initiative. Although the trainee appreciated the visit to his home by the trainer, he felt that in many ways it came too late – by the time the trainer visited, his mistakes had already led to the loss of the mushroom harvest for that season. Had his training entailed daily involvement in preparing compost under a mentor, his mistake would have been identified early, and he would not have wasted his investment. He was disappointed that in this ASCI programme, he was only being called in sporadically to attend training – and that special activities, such as visits to the farm of a successful local grower, were in no way compensation for ongoing learning and daily mentorship.

Pratik was not alone. Very few trainees felt that 3-6 weeks was too long (most said it was neither too long nor too short), though some did complain about repetition in programmes. Young people,

in particular, were seeking more comprehensive exposure than a traditional extension programme could provide. While some women did note that it was difficult for them to attend training while they had both farming and domestic obligations, those who had enrolled were able to arrange with family members or neighbours to help with their work while they attended. Thus, while the assumption that rural people are too busy to attend longer-duration training may hold true for some potential trainees, it did not apply to all of them. The ASCI programme provides opportunities to train those who may not be the traditional attendees of an extension training programme, and to develop their skills in a more comprehensive manner. Many trainees appreciated this opportunity.

5.3. Decision-Making and Planning

Another major concern about the ASCI scheme, articulated by trainers at various stages in their careers and in different institutions, was the decision-making process – particularly in relation which ASCI training programmes each KVK and agricultural university would offer. These decisions were made by the Zonal Coordinators of ICAR – the federal government body that retains administrative responsibility over KVKs and agricultural universities, especially in relation to extension. Each Zonal Coordinator has responsibility over dozens of KVKs and several universities. Zonal Coordinators provided the training organisations a list of possible ASCI programmes and asked them to indicate which of them they had the staff and infrastructure to implement. Zonal Coordinators then allocated ASCI modules to each eligible agricultural university and KVK in a more-or-less top-down fashion.

This centralised approach to planning went against much of the current discourse on agricultural extension, and trainers seemed aware of this. Since at least the 1990s, there has been a shift away from top-down approaches to extension, recognising that extension programmes should be designed and regularly reviewed through consultation with farmers. In India, there have been efforts over the last two decades to decentralise extension services and make them more participatory and open to input from farmers and the private sector (Singh et al., 2006; Glendenning & Babu, 2011). Trainers interviewed for this research were aware of the importance of consulting farmers about the kinds of training they would like to attend. Some noted that their regular training programmes are matched to farmers' aspirations and schedules and timed in a manner that is sensitive to the seasons. Moreover, trainers emphasised their own knowledge of the local economy and that they would know better than a bureaucrat in a centralised agency the kind of training programmes that would have a local impact. The top-down imposition of the ASCI trainings seemed starkly at odds with their perceptions of effective planning procedures.

None of the extension staff, when asked about this decision-making process, gave positive comments. Most were at least moderately resentful about their limited input into the choice of which programmes to offer, experiencing it as an unwanted imposition. In the words of one trainer in a KVK, 'We haven't chosen these programmes – we have been given these programmes!' This trainer added that the only input that extension staff had into the process was providing a list of the expertise that they had available, but that sometimes even this advice was overlooked by ICAR in assigning programmes:

> [I]n some KVKs they have done blunders also – like the [trainer] is of fruit science and they have given them training on beekeeping.

Even in instances where 'blunders' were not made, extension staff often did not feel that ICAR's decisions were ideal, or that just having available expertise was an adequate basis for allocating a particular training programme at a given time. For example, ICAR had assigned one KVK to undertake poultry training because the staff there had listed that they had the capacity to provide that training. And yet, KVK staff felt that they were much better equipped to undertake other kinds of training, such as dairy, as they had better facilities to do so. A trainer at this KVK complained that being assigned training programmes that weren't part of their usual repertoire of trainings often meant 'starting from scratch' – developing strategies to teach subjects in which they are less experienced and, in some cases, building new facilities or upgrading old ones. This was experienced as a significant inconvenience and ASCI did not provide finance to upgrade facilities.

Some trainers also questioned ICAR's judgement when they were assigned courses that, they felt, had limited potential to improve local livelihoods. One training programme in particular was mentioned by trainers and administrators at three separate institutions as being assigned by ICAR despite having limited potential benefit for trainees. This was the 'agricultural extension service provider' training. The syllabus for this course outlines a set of practical skills for engaging with farmers that hypothetically enables trainees to go on to start their own business as private extension service providers. Extension staff were highly sceptical of this, being convinced that there is very little scope to start such a business, when public extension services and agri-chemical retailers have already saturated the market with free extension services. They did not believe that there was a great deal of local demand for this course and, unsurprisingly, they did not find potential recruits forthcoming. One expressed a sense of disempowerment, having to recruit trainees for a programme that he did not believe would bring tangible benefits.

For other extension staff, the problem of centralised decision-making was not exclusively reducible to ICAR assigning the trainings. The problem was, rather, with the conceptualisation of the entire scheme, in which a centralised body (ASCI) had designed curricula to be adopted throughout India, without due sensitivity to regional differences. For example, the Director of one KVK stated:

> The programmes are prepared by the Central Government. They are not aware of the basic problems of this area. Programmes should be assigned to the concerned university or department after consultation with local departments or local scientists. Actually, feedback from farmers is very important… [and] the feedback of the scientist who is living here – he knows what kind of difficulties, what kind of problems, what kind of prospects, what kind of opportunities.

Trainees were not in a position to directly comment on issues such as those raised by this Director, though a small number did articulate that the training programmes did not cover all of the topics they were hoping to learn. Yet, it was noteworthy that in follow-up interviews, one of the main obstacles preventing trainees from making use of what they had learnt in training was that the somewhat abstract knowledge imparted was not in alignment with local realities. For example, training in animal husbandry advised on feeds that would best meet animal health requirements, yet region-specific seasonal variability in the availability of feed meant that they had to make

significant adjustments to what they had learnt. While trainers were advised to adjust ASCI's curricula to local requirements as necessary, a more explicitly bottom-up approach to programme design may have avoided such dilemmas.

One senior extensionist at an agricultural university believed that this was part of a broader shift towards externally imposed, target-driven trainings that were, in his view, significantly undermining the efficacy of extension. He observed that in the decades since he started as an extensionist, there had been a shift away from flexible approaches towards programmes with a fixed topic for training, which needed to occur within a specific time-frame, and with a specified number of trainees. This resulted in the imposition of training programmes that were not ideal for the local environment, nor at the right time of year – whereas internally-coordinated extension programmes were planned in relation to locally grown crops and adjusted to local seasons. When a fixed number of trainees were required – as in the ASCI scheme – trainees were enrolled exclusively to fill seats, which drove extension staff towards recruiting trainees who were not 'serious, motivated persons'. Ironically, he felt that ASCI's TVET programme was a 'very good scheme' with a lot of potential, but the requirement that specific training programmes must be conducted during set time periods made it part of the broader erosion of the autonomy of extension.

Extension staff's support for a more decentralised decision-making model was in line with the consensus view in the literature on extension and institutional reforms enacted by governments over recent decades.[7] Yet, it is difficult to reconcile a bottom-up approach to programme design with the policy-level push towards a nationally standardised system of qualifications recognition that is central to India's TVET reforms agenda. Moreover, decentralised programme planning comes into conflict with a core assumption of TVET – namely that the number and type of trainings offered in a TVET system should be determined by industry. In the industrial and service sectors, the reasons for this are relatively straightforward – if there is no industry demand for particular skill sets, then trainees will graduate with minimal employment prospects. In ASCI's case, however, it is less clear what constitutes 'industry' or 'industry demand', given that most graduates of ASCI programmes will go on to be self-employed or work on the family farm. It appears that in the absence of a clearly defined 'industry', ICAR's Zonal Coordinators have been enlisted as the arbiter of which programmes will be most beneficial for particular districts – presumably after receiving input from relevant stakeholders. It is also likely that ASCI would be resistant to the idea of devolving decision-making power, given India's experience with vocational education reform. There is some evidence suggesting that India's provision of excessive autonomy to local TVET providers has resulted in providers teaching the same material each year, without updating curricula or programme design (Pilz, 2018). Were decision-making to be decentralised, too much would hinge on individual training providers engaging in a proper consultation process with potential trainees. Extension staff would argue, however, that it is a core part of their job description to remain engaged with farmers and contemporary agricultural science to ensure that their training programmes are relevant and up-to-date. With such fundamentally different

[7] There are, however, some noteworthy alternative perspectives on this matter. Some have cautioned that decentralising decision-making in extension by allowing greater local input may allow powerful local actors to articulate their priorities as representing the priorities of the entire community – thereby creating further barriers to creating skill development programmes that assist those most in need (Thomson & Scoones, 1994).

perspectives prevailing on this issue, it is unlikely that this source of tension will be resolved in the near future.

6. Discussion and Conclusion

Largely due to its lack of institutional capacity for agricultural TVET, India has implemented its new agricultural TVET scheme via its institutions of agricultural extension. This has spotlighted some of the core differences between these two modalities of farmer education. Extensionists have implemented the scheme according to their own disciplinary assumptions and professional experience and this gave rise to at least three sources of tension. These tensions, however, prove instructive, demonstrating how different approaches to farmer education may be suited to different purposes.

Despite critics' suggestions that agricultural TVET offers little that cannot be provided through extension (e.g. Mehrotra et al., 2014), the findings presented in this paper suggest there is a substantive sense in which TVET offers something different. The gap between trainees' expectations of what a skill development programme should provide and what extension service providers were able to deliver reveals demand for more comprehensive programmes to develop agricultural skills, as a TVET programme implies. For youth with limited experience in agriculture, farmers branching out into new ventures, and those with limited literacy or formal education, the more practical, hands-on approaches implied by a TVET framework were clearly attractive, as were somewhat longer-duration trainings.

This is by no means to suggest that there is any immediate need to replace traditional extension services with TVET programmes. Indeed, some of the concerns raised by extension staff about the nature of the ASCI programme highlight reasons why extension services will continue to serve an important role for large sections of the rural population. Trainings offered through traditional extension services are shorter in duration and can be taken to farmers' fields, making them more accessible to sections of the rural population who lack sufficient time for more comprehensive training – particularly women. Extension's focus on knowledge, rather than practical training, may continue to make it a more relevant medium of instruction for experienced farmers, who may be dismissive of the idea that they need additional 'hands-on' experience. And the capacity of short-duration extension trainings to operate in a more decentralised, impromptu manner makes them more responsive to the unique needs of local rural economies – something that can be overlooked in TVET programmes, which exhibit a will-to-standardise through more uniform approaches to training and top-down planning.

In some respects, these tensions highlight that in the global South, one cannot assume that the standard approaches to TVET used in the industrial and service sectors will be transferrable to the agricultural sector. Most importantly, the idea that 'industry demand' should determine the kind of training programmes on offer is questionable in the agricultural sector, as most trainees will not go on to work for industry. They are more likely to be self-employed, meaning it is more

appropriate that *their* demands for new skills should determine which programmes are offered – and this is largely what efforts to decentralise extension have sought to achieve.

It is possible that hybrid approaches may be the way forward. For example, programme designers could consider combining the more structured, longer-duration, practical approaches of a TVET system, but plan them in the more decentralised, participatory manner, as is regarded as 'best practice' in extension. Decentralised and participatory planning may also lead to the development of scheduling and flexible delivery arrangements that make programmes more accessible – thereby overcoming extensionists' concerns about rural people's time constraints. Such hybrid approaches, however, would require meaningful two-way communication between the extension and TVET systems that acknowledge and reflect upon differences in approach, rather than the top-down imposition of a new scheme by a centralised bureaucracy.

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