

## Scale and the Politics of the Organic Transition in Sikkim, India

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## **Scale and the Politics of the Organic Transition in Sikkim, India**

In 2016, Sikkim, an Indian Himalayan state announced that it had certified all agricultural production as organic. In this article, we explore how Sikkim's organic policies are affecting agroecology transitions. Drawing upon 47 interviews with Sikkimese farmers, consumers, and government officials, we explore how questions of scale are central to the Sikkimese state's organic vision. Our four-part analysis reveals how the state's move to scale up organics reflects: 1) the state's perception that areal scale and low yield are the major constraints to their organic vision. To address this perceived constraint, the state is attempting to: 2) re-scale farm production to increase yield in single commodity crops, and 3) re-scale social processes to collectivize production and marketing. 4) Education is a primary pathway through which the state seeks to re-program farmers to engage in scaled up production and yield-oriented vision of cooperation. Our results show how these different scalar processes intersect, shedding new light on debates about the role of the state in agroecology transitions.

Keywords: agroecology, organic agriculture, India, Sikkim, state

### **List of Acronyms**

APEDA	Agricultural and Processed Food Products Export Development Authority
ATMA	Agricultural Technical Management Authority
CEO	Chief Executive Officer
FPO	Farmer Producer Organization
MOVCD	Mission Organic Value Chain Development

## **Introduction**

Sikkim, India has been declared the first all-organic state in the world, a designation that is the product of more than a decade of state-driven policy development and implementation. Sikkim's organic transition began in 2003 with a resolution in the state assembly to convert all agricultural land to organic farming. At that time, Sikkim was using approximately 10 kg of chemical fertilizers per hectare per year compared to the national average of 90 kg/ha (Avasthe et al. 2016). With chemical fertilizers use already minimal, the state took the further step in 2009 of closing down all commercial fertilizer and pesticides outlets. In 2014, the state banned the importation of any chemical pesticides or fertilizers into Sikkim from West Bengal, the primary connection point between the Indian state of Sikkim and central India.

In 2016, after thirteen years of integrated policy work and on-the-ground certification, the state government declared that all of Sikkim's 75,000 ha of agricultural land was certified organic. In 2018, Sikkim won the Future Policy Award, which is co-sponsored by the Food and Agriculture Organization, the World Future Council, and International Federation of Organic Agricultural Movements (IFOAM), for its efforts to "scale up agroecological approaches at the local, national, and international levels" (Times of India 2018). According to the FAO, Sikkim serves as an "excellent example of how other Indian states and countries worldwide can successfully upscale agroecology" (FAO 2018b). These accolades are indicative of an extensive and even unprecedented attempt of a state to scale sustainable agriculture. Yet, many questions remain about the impacts, implications and dynamics of the transition underway in Sikkim.

While Sikkim's policy is technically focused on organic agriculture, it has also been celebrated as the "best agroecology policy" in the world. We argue that this honor should be

critically examined, as agroecology and organic agriculture are related, but not synonymous.

What originally began as a grassroots social movement, organic agriculture has now also become codified in regulatory and third-party certification systems to enable the effective marketing of organic products (Jaffee and Howard 2010). Since the first organic standards were developed in the 1990s, organic agriculture has expanded significantly, and has made important gains in terms of advancing the ecologisation of agriculture. However, in many cases small marginal farmers are unable to participate in organic value chains structured by major corporations, which involve large-scale monocultural production based on input-substitution (Guthman 2004; Johnston et al. 2009). Thus, the scaling up of organics has been criticized for its conventionalizing effects, “a process whereby organics takes on many of the characteristics of mainstream agriculture regarding scale and structure” (Constance et al. 2015, p. 1).

Agroecology, by contrast, is the design of agricultural systems around ecological principles, involving internal feedback loops of on-farm resources (Altieri 1995; Gliessman 2006). It entails a process of continuous transition that does not follow prescriptive rules, but is based on core principles (Altieri, 2018; HLPE, 2019), values (Nyéléni Movement for Food Sovereignty, 2015) or elements (FAO, 2018a). Agroecology is centred on the synergistic relationship between people and nature, the agency, knowledge and rights of food producers and other food system actors, and the de-centering of: profit, market-led approaches, and technology transfer approaches to knowledge. Thus, while some farmers using agroecological systems may market their products through organic marketing channels, not all organic agriculture reflects the social, political aspects of agroecology. Indeed, organics has been criticized for moving away from its basis in bottom-up social process and alternative political values towards a market-led approach (e.g. Guthman 2004).

This study engages with the debates about the role of the state in sustainability transitions. There are growing examples of government policies that are supportive of agroecology (Sabourin et al. 2017; MAAF 2017; FAO 2018a). However, Giraldo and McCune (2019) argue that the state's role in scaling agroecology has generally involved an institutionalization that compromises the values and political basis of agroecology. Ajates and Chang (2018) discuss how the translation of agroecology into public policy creates a hybridization, dilution and co-optation of agroecology. Author B (forthcoming) similarly warns that, while the state can play an important role in mobilizing resources, and in shielding agroecology from hostile regulation, that the state also often plays a direct role in containing, coopting and even suppressing agroecology. These studies highlight the need for nuanced analysis of the role of the state in sustainability transitions.

Education has long been an important area of scholarship in the literature on agroecology (Lieblein et al. 2007; Salomonsson et al. 2009). Much of this research has focused on the important pedagogical work of agrarian social movements (McCune et al. 2014). La Via Campesina, for example, has been increasingly devoting energy and resources to advancing agroecological education through its network of more than forty agroecological education centers (Khadse et al 2018). For food sovereignty activists and academic allies, a combination of horizontal and vertical pedagogical processes are essential to bring agroecology to scale (Author B, 2018). Vertical pedagogies consist of hierarchical forms of instruction common to academic degree programs. Horizontally-scaled learning involves knowledge being shared and critically engaged with through networks. While agrarian movements efforts to advance agroecology have received sustained academic attention (Martinez-Torres and Rosset 2014; van der Ploeg 2014),

the state's role in mobilizing education to scale up organic and agroecological agriculture has received comparatively less.

In this article, we engage with debates surrounding the politics of knowledge and the scaling of sustainable food systems, drawing from the geographical literature on scale to provide new theoretical insights into the state's employment of education in processes of transition. The politics of knowledge, as Goldman and colleagues (2011) define it, concern the processes involved in the production, circulation, and application of knowledge.

In this article, we address the following questions: 1) how do issues related to scale and the politics of knowledge structure the Sikkimese state's creation and implementation of organic policy?; 2) how are the politics of knowledge involved in the Sikkimese state's organic transition; 3) what are the implications of scaling for understanding the role of the state in agroecology transitions? To make sense of how the Sikkimese state mobilizes knowledge production to scale organic agriculture, we draw upon a political ecology of education framework, which highlights how the distribution of power and resources among interconnected political and cultural entities mediates pedagogical processes—from tacit to formal learning—affecting access and control to natural resources, interactions with the cultural landscape, and conceptions of nature-society relationships (Author A, 2015a,b,c, 2016, 2017).

In the first section of the article, we review the emerging literature on agroecological scaling, and cross-pollinate this debate by adding geographic perspectives on scale. We define and provide examples of these different types of geographic scale and their relevance for both agroecological and organic transition. After presenting our methods, we draw on our results to analyze how the Sikkimese state conceives of and deploys scale in three main ways: 1) scale as size of land area as a constraint for achieving production suitable for larger markets; 2) Scale as

reconfiguring farm production and landscapes; 3) Scale as a social process. We then provide an extended ethnographic vignette of a farmer field school in East Sikkim, which highlights how questions surrounding the politics of knowledge are central to understanding both the scaling of organic agriculture, and how the political ecology of education is structuring the organic transition.

### **Agroecological and Geographic Perspectives on Scale**

The concepts of scale and scaling have been increasingly prominent in academic, policy and activist debates surrounding agroecology (FAO 2018a; Parmentier 2014; Khadse et al. 2018; Mier y Terán et al. 2018; Ferguson et al. 2019). For example, in the last year, there have been six edited collections focusing on papers that address the issue of how to scale agroecology (sometimes referred to as transitioning) (AgroecologyNow 2019). In 2015, social movements from around the world came together in Mali to articulate a set of principles that should inform any attempt to scale agroecology (Nyeleni 2019).

In Ferguson et al.'s (2019), introduction to a special issue on the topic, scaling is defined as surrounding the “relationships, processes, policy, power, and practice that nurture social organization, learning, and adaptation (Ferguson et al. 2019: 722).” Many of the recent analyses of scaling sustainable food systems have focused explicitly on agroecology, and the drivers, such as pedagogical practices, crises, and favorable agricultural markets that either enable or preclude individuals from producing agroecologically (Anderson et al. 2019; Mier y Terán Giménez Cacho et al. 2017).

Scaling is simultaneously an economic, ecological, social, spatial and political process that has been expressed in the transitions literature as involving two interlinked processes -

scaling out and scaling up (Beckie et al. 2014; Pitt and Jones 2016; Johnson and Baker 2005). Scaling out involves the horizontal replication of agroecology, reflected in Mier y Terán Giménez Cacho's (2018, p. 3) definition of scaling as "a process that leads ever-greater numbers of families to practice agroecology over ever-larger territories and which engages more people in the processing, distribution, and consumption of agroecologically produced food." While grassroots agroecological processes of scaling out have clearly been evidenced as important in agroecology transitions, the role of scaling up - achieving transition through shifts in policies and institutions at the level of programs, regulations, legislations and laws - has received relatively less attention. The case of the Organic Mission in Sikkim represents a primarily state-driven process of scaling up.

These debates on scale and transitions have yet to fully engage with the theorizations of scale from human geography. Scale is one of the central, and most heavily debated, concepts in geography (Liu and Wang 2011), but is deployed in different ways within the discipline. Cartographic scale is a measure of the corresponding relationship between a map's size and the distance of the earth it is supposed to represent. Within this conception, large-scale maps depict small areas, but hold more detailed information than small-scale maps, which by contrast, depict a larger area and contain less detailed information. Operational scale, by contrast is the geographic area (or unit size, i.e. a land plot or perhaps a bioregion) at which processes are understood to operate and can be observed (Swyngedouw 2004). Here, the meaning of scale is reversed: a large-scale study might focus on territorial processes, for example, the transition of an agrarian movement's base from conventional agriculture to agroecology, as happened with Brazil's Landless Workers Movement in the 1990s (Valdão and Moreira 2009). A small-scale study, by contrast, might be operationalized to focus on the constraints individual families face in



transitioning to agroecology. By contrast, *measurement scale*, also frequently described as *resolution*, is the smallest distinguishable parts of an object, such as a pixel in a satellite image, or a sampling interval in an agroecological study. Measurement scale is of direct interest to agroecologists who might be interested in employing satellite imagery to visualize the presence of agroforestry, or integrated production systems within a broader agricultural context (Velásquez-Runk et al. 2010).

Within human geography, social and political analyses of scale illustrate how scale is socially constructed and relational - not so much an analytical unit, but rather a set of sociospatial processes (Marston 2000; Marston et al. 2005; Jonas 2006). Geographic scale is a major focus of human geographic scholarship, because it offers a powerful set of lenses for analyzing the economic, cultural, political, and environmental manifestations of globalization (Cox 1998). One of the primary insights from this literature is that that the urban, regional, national, and global ‘scales’ are neither discrete nor preexisting categories, but are rather relational and socially produced during the process of the expansion of capitalism and its resistances (Smith 1992). The implications of this for agroecologists are that areas of engagement such as the ‘local,’ are not homogenous or singular, but rather sites of contestation that are interconnected with networks (Winter 2003; Feagan 2007).

A second, and related, argument is the recognition that scale is an explicitly political process, that involves institutions and actors that are maneuvering locally, regionally, nationally, and internationally in a response to the dictates of capital. Scalar configurations—such as the ‘local’ or ‘global’ are constantly shifting and contested configurations (Swyngedouw 1997). Doreen Massey’s (1993, 1999) conception of a power-geometry is instructive; for Massey, social relations are spread out over space, from the household, to the regional, to the international.

Social positioning across these spaces is differential, and one's position within this matrix affords individuals a higher or lower degree of power in relation to others who have less mobility and ability to structure the flow of resources and knowledge. Particularly relevant here is the idea of "jumping scales" (Smith, 1992, page 60), which involves circumventing and dismantling "historically entrenched forms of territorial organization and their associated scalar morphologies" (Brenner, 1999, page 62). By recognizing that scales are socially produced and differentiated by power relations and political economy, we avoid codifying particular scalar configurations as absolute, and rather recognize the interconnected scalar processes that produce particular spatial configurations, such as agroecological transitions.

## **Methods**

This article provides an analysis of qualitative data collected over three visits to Sikkim (table 1). We carried out forty seven semi-structured interviews across these three visits, whereby interviewees fell within three broad categories: 1) farmers (in three of the four regions of Sikkim); 2) consumers/vendors (primarily in the capital city of Gangtok); 3) state actors: extension agents and directors that are part of the Agricultural Technology Management Authority (ATMA), government officials (high-level administrators in Sikkim's State Organic Mission) and national-level policy makers in the Agricultural and Processed Food Products Export Development Authority (APEDA).

The first field visit in 2016 was weighted towards government officials, reflecting our initial interest in understanding the workings of government and policy making in the Sikkim case. Government officials were identified by a process of snowball sampling, where we started with highest level policy makers, and through introductions worked outwardly from program

directors and then to extension agents (Bernard 1995). Interviews lasted approximately one hour and were oriented towards an individual's position: governmental officials were interviewed about the history of policy development, and extension agents about implementation. Interviews were carried out by in English by Author A.

The second field visit in 2017 involved repeat interviews with each of the government officials from Phase 1, and involved further snowballing to field level functionaries. This research period also involved site visits to three farming field schools (focusing respectively on integrated farming systems, apiculture, and rajma [legume] production). Field visits lasted between one and two hours, and involved site visits to areas of agricultural production. Interviews with FFS teachers surrounded their participation in training programs, changes in agricultural production, and perspectives on changes in their livelihoods and ecologies associated with Sikkim's organic transition.

The third visit purposefully selected a larger number of farmers consumers/market vendors – or participants from the ground level. This was enabled through the assistance of a local activist (Gyatso Lepcha) with strong linkages to farmers through civil society. Here, interviews focused on the impact of the organic policies on their farms and their communities. We also spoke with consumers and market vendors to understand the implications of, and perceptions towards, the organic policies.

Based on a preliminary analysis of the data from the first two visits, we sought specifically to: a) interview a greater number of farmers and consumers; b) ask questions that specifically filled out gaps in our data and that allowed us to deepen our emerging analysis. The collected interviews from the first two visits were analyzed through an iterative process of coding in MaxQDA, which highlighted the politics of knowledge, scale and political economy as

central themes. These themes are presented and discussed below and, in some cases, direct quotes are used to illustrate key points. Participants names are pseudonyms, except in the section where we discuss the video, as these participants asked to be named.

Field Visit	Total N	Differentiated N		
		Government	Farmers	Consumers and vendors
28/10/16 to 06/11/16	12	4	4	4
28/10/17 to 06/11/17	14	8	4	2
08/10/19 to 06/11/19	21	3	10	8

**Table 1** – Qualitative interviews carried out over two field visits in Sikkim.

### Section 3: Results and Discussion

#### 1. *Scale as Constraint*

The Sikkemese state decided to develop its organic policy, and transition its farmers to certified organic agriculture, in large part out of the state’s concern about scale, but also as a part of a wider move to articulate a vision of a Green Sikkim. A mountainous region, Sikkim’s landscape is defined by small landholdings typically cultivated in terraces. The Handbook of Organic Crop Production in Sikkim (2014) describes mountain terrain as being a major factor driving land management decisions (v). Only 11% of Sikkim’s land is under cultivation, and 60% of the state is dependent upon rainfed irrigation. More than 80% of the state’s farmers are traditional agriculturalists, who already use a variety of agroecological techniques in settings where integrated agroecological systems are relatively common. The majority of agriculture, particularly in Sikkim’s indigenous territories, is at a subsistence level, particularly for traditional varieties of food grains that are well-adapted to the region (Pradhan 2008). Principle cash crops are maize, rice, large cardamom, ginger and mandarin (Avasthe et al 2016).

Farmers hold modest sized land parcels of .5 ha. The state sees these physical features as resulting in “low productivity with negligible marketable surplus and other institutional inadequacies, (which) led to agricultural backwardness” (State of Environment 2007). In interviews with state officials in the Organic Mission, the areal size of the landholdings was often described as a constraint. This spatial constraint surrounding resolution is connected to productivist concerns to increase yield (Sampson 2019). Articulating scale as a problem to be solved is an example of problem definition, where the description of the context of a situation necessitates a particular set of interventions. From the state’s optics, scale is viewed in a deterministic sense as a structure, which due to its area is a fixed constraint.

## *2. Scaling Farm Production and Landscapes*

The Sikkimese organic policy seeks to increase scale-as-yield through the spatial redesign of agroecological systems. It is helpful to think about agricultural systems systems in spatial terms. An intercropped agroecological system, for example, consisting of minor crops for domestic consumption, with livestock, non-timber forest products, and market crops, is spatially dense, consisting of intersecting feedback loops (Altieri 1995; Gliessman 2006). A monocultural organic agricultural system, by contrast, is more spatially homogenous. The present form of traditional agriculture in Sikkim, which officials describe as ‘organic by default,’ is also viewed as a constraint to achieving the scale-as-yield that the state desires. In interviews with state officials, the need to increase productivity came up frequently. As one official described, “We are trying to increase the intensity of cropping. We are doing all means to increase our productivity.” “Intensity” is being used in this context to signify the conversion to single or two-crop focused organic agricultural systems. For the state, focusing on a single crop, such as

cardamom in North Sikkim, will encourage farmers to increase the yield of specific crops. As Rajiv, a national official, who had been actively involved in developing Sikkim’s organic policy, described: “this will help in generating the volumes.”

However, at the same time, this clearly reduces agrobiodiversity. In the village of Gnongsangodong, interviews with farmers emphasized that agrobiodiversity is being lost as farmers are converting to hybrid seeds provided by the government, which are intended to create increased yield, but were also found to be more susceptible to pests and incompatible with cultural tradition. In a group interview, Chewang Lepcha remarked, “there are so many traditional crops in our community...which were preserved by our ancestors but they are slowly disappearing.” Another farmer (Sangdup Lepcha), riffing off of these comments, indicated, “all these hybrid seeds and plants, which have been distributed by the Sikkim Organic Mission are more susceptible to attack from pests...[they] are difficult for us to save and preserve...Plants grown from non-traditional seeds will not be accepted by local deities.” (Video 1).

Thus, in many cases, the state’s organic policies are transforming spatial systems of production, moving in certain contexts from dense and diverse agroecological polycultures to organic monocultures, reflecting a substantial reorganization of landscapes and nature. Such an approach shares certain similarities



*Video 1 – Farmers in Dzongu, Northern Sikkim, discuss the importance of traditional seeds, the challenges they face with the promotion of hybrid seeds and plans to develop a community seed bank, highlighting the ingenuity of farmers, indigenous peoples and communities*

with the one-crop-one-village model that has been proposed in other geographic contexts, such

as Rwanda (Issacs 2007). This isn't exactly a proscribed one-crop-one-village model system as there is, at least in theory, the artifice of choice. As Rajiv described

Farmers have liberty to go for multiple cropping, but we are emphasizing one main crop which will have the market potential for export. For example, in North Sikkim, they will go for one crop which is Cardamom. They can grow other crops for subsidiary income, but the majority crop will be one, and that is Cardamom.

In this way, government isn't pushing farmers towards uniformity, but are creating incentive structures to pull farmers into farming systems that align with the governments conception of scale-as-yield. Farmers have some autonomy, in that they can continue to practice agriculture as they wish, including planting crops for subsistence and local informal markets, but there is no support for subsistence-based agriculture. One interviewee who was the CEO of an FPO indicated,

In the FPO, we select the progressive farmers. Only those farmers who can produce and give it to us so we can market it. We don't invite shareholders who have less land who cannot produce and sell. If he produces for his own self-consumption, we won't invite them to our FPO

As this CEO suggests, subsistence production doesn't pay, because it doesn't achieve the market-oriented scaling process being rolled out by the Sikkim government. Support from government is only oriented towards increasing the yield of commercial production for markets, which includes four main crops across Sikkim: Large cardamom, tumeric, ginger, and buckwheat.

### *3. Scaling as Social Process*

A core tenet of human geography is that scale is not a pre-structured hierarchical framework for organizing the world—local, national, global—but rather a product of inherent tensions between structural forces and human actors (Marston 2000: 220). As Erik Swyngedouw

(1997: 169) argues, scaled places are “the embodiment of social relations of empowerment and disempowerment and the arena through and in which they operate.” To analyze scale as a social process involves exploring what forces shape social orderings and activities at different levels. The Sikkim Organic Mission is creating new forms of social organization with the goal of once again increasing yield to service larger markets. Because farmers have small landholdings, averaging from .5 to 2.5 ha, the state is promoting the development of “clusters.” These cultivation clusters are comprised of 500 farmers and are intended to create a volume that is of the scale appropriate for selling to markets that require large quantities of product (Author B 2019).

In order to achieve scale-as-yield, the government has developed new scalar social institutions in the form of clusters, which are new forms of socially organized production. The creation of these clusters is part of a broader social process of scaling, because it enrolls more farmers into the government’s scaling process and vision. In contrast with the civil society driven form of scaling (e.g. Ferguson et al 2019), this social process is manufactured by government who is creating new organizational forms that are suited to feed into supply chains both nationally and internationally. Here, social reordering is taking place to achieve indices of production fit for the dictates of capital effectively shifting away from agroecological production and from subsistence agriculture. These FPOs will be integrated into national and global commodity chains through a Central government program known as Mission Organic Value Chain Development (MOVCD), which provides financial subsidies for state-selected agricultural crops, as well as organic agricultural inputs (seeds and biofertilizer) necessary for production.

At present, farmers are not producing at a sufficient scale to meet fulfill large purchasing orders (such as one FPO’s recent order for 100 metric tons of turmeric). There are myriad



reasons farmers are not reaching these production indices, as an FPO CEO named Rupendra described to us. Still incredulous after past failed development projects, many farmers are suspect of the FPOs, and will sell their production independently in local markets. Another constraint that farmers underscored was the frequent delay in obtaining the necessary inputs (seeds and biofertilizers) promised by the state; turmeric seeds, for example, would arrive after the harvest was complete. To mitigate these challenges, FPOs across Sikkim will coordinate and pool their production of specific crops. Once stockpiled, crops will be transported using MOVCD subsidized trucks, which are provided to FPOs, to the Organic Mission's processing center. Here, value-added processing can take place, such as converting raw turmeric into powder, before it is distributed to the purchaser. The FPOs are a novel form of social organization intended by the state to produce particular crops, selected by the government, at a scale for export-oriented production. Financial and material resources, in the form of agricultural subsidies, inputs, and transportation, are provided to farmers through a value-chain program which creates relational networks of production across space, highlighting the capacity of political economy to connect distant locales.

#### *4. The Role of Education in State-driven Scaling*

Farmer field schools (FFS) are an important pedagogical space throughout India. Beginning in the 1990s, the Indian government in collaboration with the Food and Agriculture Organization and European Union began using FFS to provide cotton farmers training in integrated pest management (IPM). India's FFS are financially supported by the National Policy for Farmers, and involve farmer-to-farmer learning through site visits to progressive farmers, whom are seen as exemplary in a particular area of agricultural production. FFS run for a full crop season

and engage 20-25 farmers alongside an agricultural extension agent who serves as a facilitator on weekly field visits to other neighboring farms. Global analyses of FFS show that benefits of farmer participation include reduced usage of toxic pesticides, and increased collective action, social organization, and problem-solving skills (van den Berg and Jiggins 2007; Feder et al. 2010)

We gained deeper understanding of the benefits of being a progressive farmer in 2019, during field research in Kamachery, East Sikkim. Accompanied by Satviya, the CEO of a Farmer Producer Organization, we visited a progressive farmer named Dogon's 5-acre model farm, which functions as both a FFS and a demonstration site centered around Integrated Farming Systems (IFS). Each terrace is densely packed with intercropped species. Yet, space in these terraces remains at a premium, and bamboo trellis systems are set up over many of the walkways, providing an additional growing area for squash and bitter guard, as well as shade for crops. Exemplifying the IFS approach, marigolds fill the sides of the path to ward off bugs, and in the banana field lemon grass is intercropped. Once harvested, Dogon tells us, the oils, and smell, of the lemongrass will remain in the soil for more than six months, serving as a powerful deterrent to pests. For Dogon, one of the key advantages of an IFS approach is the ability to reduce damage by pests through these types of associated plantings.

Turmeric is one of the four main crops the Sikkim Organic Mission is focusing on, and is Dogon's main cash crop, which he sells through the FPO, which Satviya helps coordinate. Dogon explained how, since becoming a progressive farmer, his production has skyrocketed,

Before 3 years, everything was very small. I used to expect around 800 kilos of turmeric per season but this time, I have sowed 600 kilos of seeds and I am expecting 6000 kgs in yield. Everything I'm doing is double or triple now.

This meteoric rise in the production of turmeric, and the new crops that are filling the landscape, is undoubtedly partially due to his increasing experience. However, the landscape's material transformation, and the scaling of his agricultural system is also tightly linked to education and the political and economic opportunities it has brought him, including access to state funding.

In 2016, Dogon began attending various workshops hosted by a diverse constellation of state and private entities including the horticulture, agriculture, and floriculture departments, Sikkim Organic Mission, and ATMA. Dogon estimates in the last three years he has participated in more than 200 days of training. These training are held at disparate geographic locales, ranging from his own village, to Gangtok, to nationally at horticultural training centers in major cities, such as Hyderabad, Pune and Delhi. Workshops and short courses range from single day events to 15-day or month-long courses, depending upon the location and type of course. Following successful completion of a course or workshop, farmers receive a certificate.

Participating in these trainings opens the door for students to access other pedagogical and material opportunities. For example, Dogon is expected to put new trainings into practice after participating in a workshop or course. If a management committee, set to evaluate trainees' performance, visits his farm and finds he is being successful he may be recognized as 'progressive' and offered a spot in other training opportunities. Yet, participation in these learning opportunities is also linked to material rewards. As Satviya describes this process,

If I am from horticulture department and I visit his farm and if I find it, no I mean, if I find *him*, progressive, if I find that there is potential in him for this, than if he demands a greenhouse, than I will give it to him because he is doing really well. What happens is that then the agriculture department comes and does the same thing, and then the floriculture department wants to have some plants over here and so they build the infrastructure for that.

After having taken part in a workshop on greenhouse production, Dogon received a certificate and was able to approach the Horticulture Department to make a case for receiving the funding for a greenhouse. Dogon's participation, his known status as a progressive farmer—built from his past engagement with these trainings, and his certificate make him legitimate in the eyes of the state. Dogon's first greenhouse was quite expensive, costing over \$Rs 7 lakh (approximately \$USD 10,000). As Satviya describes, the “department cannot provide a greenhouse to each and every farmer, so they will have to see who is progressive, because in many cases they will get so much interest (from other farmers) but the farmers will ultimately decide not to do it, because it is not profitable,” and will abandon a project. Education—in the form of a training certificate—provides farmers legitimacy in the eyes of the state, and access to capital and material resources.

An analysis of Dogon's agricultural trajectory highlights a scalar set of feedback loops. Starting out with small areas of production, Dogon attended workshops which provide him the legitimacy to obtain infrastructure, subsidized labor, and technology; these material resources enable him to increase his production, which in turn provides more credibility and access to resources. With resources and legitimacy in the eyes of the state, Dogon is able to “jump scales,” gaining the social capital and mobility necessary to attend workshops in distant locales; it is his engagement at these higher levels of knowledge production, and politics, which enables him to produce at higher levels of production. Here, jumping scale is “a political strategy of shifting between spaces of engagement (Jones 1998: 25),” which consist of sets of relations that delve into spaces of dependence (Cox 1998). Yet, the state is not the only benefactor that rewards participation in training opportunities. Carrying his two-year old son, Dogon walks us through a greenhouse filled with metal tables holding identical pots.

These are orchids, Dogon told us, and they are easy money; a flower company is currently leasing Dogon's land for its orchid production. They paid for this second greenhouse to be built, and supplied the orchids and all of the necessary inputs. When the orchids are ready, they will pick them up, and provide him with new ones to grow. Such examples highlight how participating in training can lead to unforeseen economic opportunities not simply in the eyes of the state.

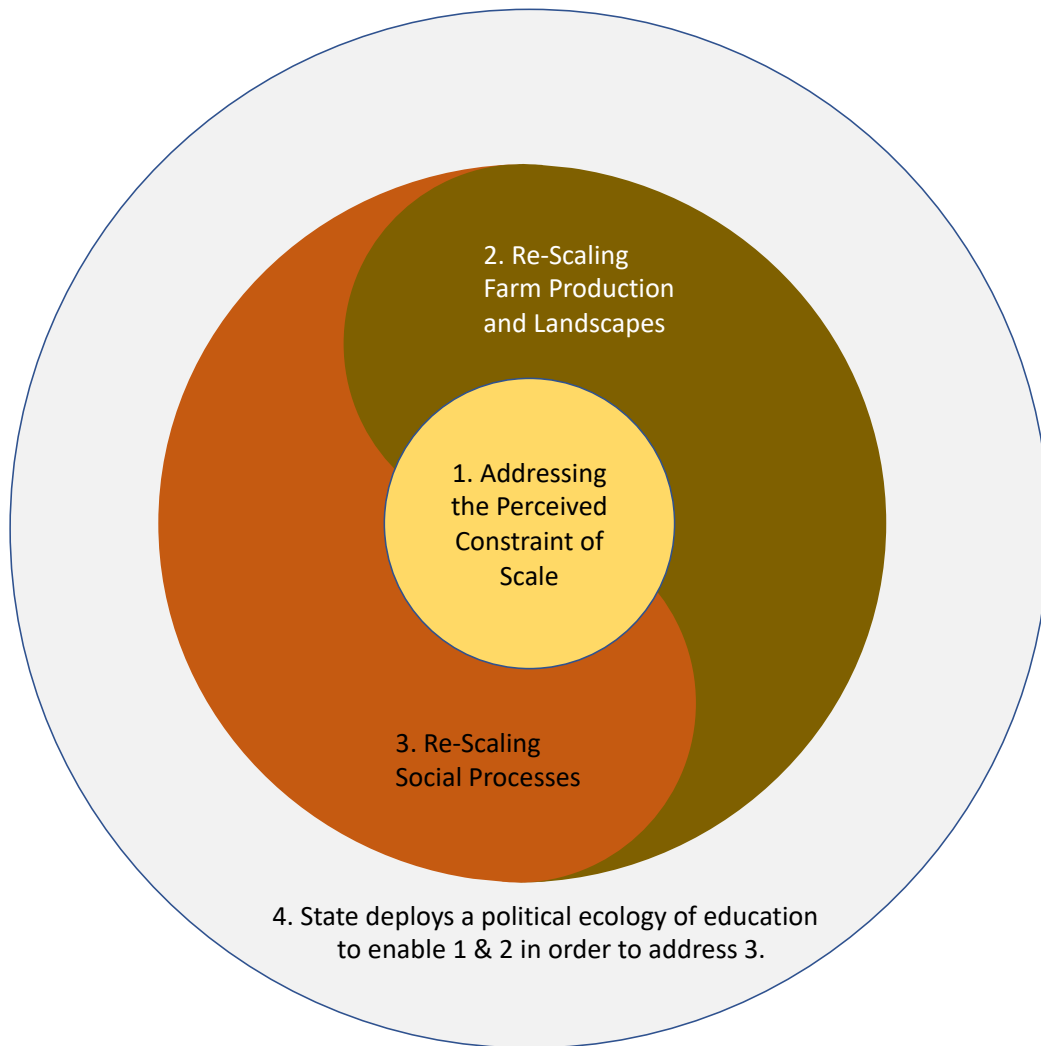
Dogon materially benefits from his pedagogical status as an FFS instructor in other ways. As an instructor, Dogon will earn RS 10,000 (\$135 USD), which is approximately 12.5% of a small farmer's annual income. Dogon is being essentially paid for his services in providing technical knowledge to neighboring farmers. This cohort of 25 will stay for three months and work alongside Dogon, taking part in all activities on the farm from land preparation to sowing to harvesting, and after they complete the course they will also receive their own certificate. Dogon's home and farm have also become a frequent site for student internships. Approximately 2-3 groups per week visit the farm, and many students from universities and colleges come for longer internships. As Satviya describes, Dogon gets "a good amount," for this work because the university or college will pay him for his teaching/mentorship services, and for offering the students' room and board in his house. Yet, along with these financial benefits, the state can mobilize its power to discipline these individuals. School participants are evaluated after the one-year FFS concludes. If the evaluation shows that farmers are not adopting the technologies, state officials will come to talk to the progressive farmer. Dogon seemed very underwhelmed at that prospect, for "then the state will come and say 'he (a FFS participant) has been trained, what has happened?'"

Dogon's last comment highlights that his own status as a progressive farmer, and FFS instructor, can be dependent on his pupil's ability to actualize their training.

FFSs are sites for scaling the organic transition by bringing more farmers into organic production systems. Here scaling is an explicitly political economic process of producing awareness, which is mediated by questions of power and positionality. Agricultural extension officers and progressive farmers are connected as part of what Massey (1999) describes as a geometry of power. Progressive farmers are chosen for a multitude of reasons, including existing privilege and caste status. These social identities and positions are rewarded as individuals move through space; successful farmers "jump scales" as they participate in workshops in major cities, and through coursework gain the institutional legitimacy to apply for credit and other material resources. These and functionaries' social positions are differentially arranged within a power matrix, structuring access to resources. One's position within this matrix bestows higher and lower degrees of power upon individuals based upon levels of social mobility and access to these resources and knowledge. From a political ecology perspective, Dogon's farm is a socially-produced landscape. Public policies, such as the MOVCD, provide a funding mechanism for the state to project a particular organic imaginary on the landscape. Here, pedagogy is being used to create scale in several ways: scaling consists of producing largely quantities of highly diversified agricultural products, and also the social process of farmer-to-farmer training whereby more food is produced on a largely traditional farm. Farmers are able to "jump scales," attending trainings in geographically disparate locales and then accessing state level resources to fund their expansion of production.

## **Discussion**

Our examination of the Sikkim Organic mission sheds light on how the politics of scale and scaling are central to the transformation of sustainable food systems and particularly the role of the state and educational opportunities in agroecological transitions. Our four-part analysis shows (figure 1): 1) The state perceives areal scale and low yield (scale-as-yield) to constrain their vision of a scaled-up organics. To address this, 2) the Organic Mission's program seeks to re-scale farm production and landscapes to increase yield in single commodity crops. 3) To do this, the state's twin process involves re-scaling social processes to create cooperatives that consolidate production outputs (e.g. cardamom) in order to service national and export markets. 4) Finally, education is critical to the state's re-programming of farmers to engage in different production practices and to 'teach farmers' how to work together according to the state's market and yield-oriented vision of cooperation.



**Figure 1** – Four-part analysis of scale and scaling processes and the deployment of education by the State of Sikkim to achieve their vision of a scaled-up organics.

Sikkim’s organic transition has been much heralded as a concrete example of how state policy can advance food sovereignty. Whereas the state has undoubtedly made huge efforts to advance sustainable agriculture, critical questions remain about the extent to which these policies will affect farmers’ food security, and food sovereignty. If “organic by design” means reducing agrobiodiversity, and transitioning to export oriented production, the state’s vision might face the realities experienced by various states who have failed to see social reality as they seek to



remake it. Although Sikkim's government is guided by progressive intentions, it is worth remembering that various social engineering experiments were driven by progressives, and often revolutionaries, because "it is typically progressives who have come to power with a comprehensive critique of existing society and a popular mandate (at least initially) to transform it" (Scott 1998: 89); unsurprisingly, these are the elite within the state. Yet these idealist elites, who often believe they know best, project spatial and social fixes that come from above, from the optics of the state rather than from the perspective interests of the people.

While the Sikkimese government has been celebrated with an international award for the best agroecology policy in the world (FAO 2018b), it is clear that their vision of scaling up organics contradicts many of the key principles of agroecology. While in some cases the Sikkimese state may be encouraging integrated farming systems, their main thrust is advance monocultural organic models for export production in a market—rather than livelihood led—approach. Whereas in agroecology, farmers and citizens are positioned as the central protagonists of scaling processes (Mier y Terán Giménez Cacho et al. 2019; Author B 2019; Nyeleni 2015; FAO 2018a), it is also clear here that the state and its government officials wield great power in setting the terms of scaling and development and, in many instances, are overriding the desires and agency of farmers and citizens.

In some cases, farmers, especially progressive farmers, are being lifted up as central protagonists. However, these farmers and their farms are often being re-fashioned as exemplars through extensive investment as part of an uneven process. These farms are the 'face' of the organic mission and provide a neat, yet (partially) artificial image constructed through substantial state-driven re-configuration, while many other farms – especially those not tied into the state's value chain model – are left with little to no support.

State-led education processes also provide certain individuals with access to geographically disparate sites of learning, and differential access to resources and power. This increased social mobility can enable in certain contexts the consolidation of land. Thus, there is evidence that the state's approach to scaling is also violating another principle of agroecology – addressing inequity (Author B 2019).

## **Conclusion**

This study provides a new perspective on scaling and agroecology, and illuminates the role of education and the politics of knowledge in these processes. While we learned that the Sikkimese organic transition was a largely top-down process, essentially devoid of civil society engagement, we also encountered deeply rooted agroecological traditions, cosmovisions and ways of knowing. Long-standing modes of inter-familial and community cooperation (e.g. communal labor at harvest) continue to exist (although dwindle) but are, within the new scaling process of the state, disregarded because they do not directly achieve the state's market- and productivity- oriented scaling agenda. These knowledges, wisdoms and community dynamics, reflect a long-existing form of agroecology, an important contributor to food security, biodiversity and well-being and an ongoing field of potential in Sikkim to nurture a just, sustainable and culturally-appropriate scaling process. Further research is needed to make visible the value of these agroecological traditions to the state, and assess the obstacles towards mobilizing a vibrant civil society, which is a fundamental foundation for agroecological scaling (Author B 2019). By continuing to analyze the political ecology of education in Sikkim, future research will yield new insights into how the politics of knowledge and historical, cultural and ecological factors intersect to structure sustainability transitions.

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