

Refereed article

The Emergence of Certified Organic Agriculture in Pakistan — Actor Dynamics, Knowledge Production, and Consumer Demand

Julia Poerting

Summary

Certified Organic Agriculture (COA) is a much debated alternative to conventional and industrialized farming, with recent scholarship having paid attention to different aspects of organic commodities within a global agrofood system. Organic standards link consumers in the Global North with producers in the Global South, and transport agricultural knowledge around the global. For farmers in the Global South, knowledge therefore plays a central role in their successful conversion to COA. This paper, based on ethnographic fieldwork in Pakistan in 2013 and 2014, focuses on the country's small but fast-growing organic agricultural sector and examines how the different actors involved in it produce and circulate knowledge about how to cultivate and market organic food crops. Producers, agricultural universities, government departments, private sector actors, and urban farmers all have to exchange knowledge so as to overcome a multitude of challenges. An analysis of the processes of knowledge production and circulation is central to understanding how knowledge travels and which practices take hold, and how.

Manuscript received on 2014-07-07, accepted on 2014-12-16

Keywords: Pakistan, Global agrofood system, knowledge, organic agriculture, Science and Technology Studies

Julia Poerting is a Ph.D. student in Geography within the cluster "Asia and Europe in a Global Context" at Heidelberg University. Her research focuses on the dynamics of alternative forms of agriculture in South Asia in times of agrarian crisis.

Introduction

Certified Organic Agriculture (COA) is a much debated alternative to conventional and industrialized farming. Organic commodities have become an integral part of the global agrofood system, and link producers in the Global South with consumers in the Global North. While the origins of organic agriculture lie in Europe and the United States, today South Asian countries are among the biggest producers of such commodities. Different models of organic agriculture, like the established standards for the labels Demeter, Naturland, and Bio Suisse, travel globally and are translated into certain practices at their points of arrival. In recent years, academia has paid attention to different aspects of COA. The literature often reads as a critique of the neoliberal agrofood system, by considering COA to be a very market-driven alternative (Campbell and Stuart 2005; Galt 2011; Guthman 2004; Raynolds 2004). Consequently, such views contribute to an understanding of COA as part of an emerging “green capitalism” trend (Friedmann 2005), whereby companies and retailers appropriate the “green consumerism” of the Global North for their own commercial gains.

Pakistan features a comparatively small¹ but nevertheless fast-growing organic agricultural sector.² The number of certified producers there rose from 28 in 2004 to 1,045 by 2011 (Willer et al. 2008, 2013). Beside producers, COA also comprises different knowledge brokers (consulting companies, researchers), national agricultural departments and private sector actors (certification bodies and export firms). The organic sector as a whole further includes agricultural extension officers, the media, NGOs, policymakers and urban farmers who all engage in the circulation of knowledge and the promotion of organic agriculture in Pakistan. The dissemination of practical as well as market knowledge among rural farmers is playing an important role in the spread of COA in Pakistan. (Urban) farmers’ markets, university laboratories, district-level greenhouses, farmers’ nurseries, and national institutes serve as platforms for the discussion and promotion of organic agriculture. Though closely interlinked, the incentives to shift to this type of agriculture are diverse: export firms respond to international demand for organic commodities and are interested in the price premium for certified organic food items, local producers pursue an environment- and soil-friendly alternative to conventional farming, urban farmers are interested in healthy living, while NGOs seek to promote ecologically and socially just ways of farming.

This paper focuses on two interwoven aspects of the emerging organic sector in Pakistan: (1) an analysis of the two major challenges faced by actors in this sector,

1 The neighboring state of India has the largest number of organic producers of any country worldwide. According to the Forschungsinstitut für biologischen Landbau (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM), there were 547,591 such producers in India in 2011 (Willer et al. 2013).

2 This paper focuses only on food crops.

namely access to knowledge and access to the market and (2) how different actors react to these challenges, specifically by producing and circulating knowledge. Recent scholarship has paid attention to the governance structures of global organic agrofood systems (Bernzen and Braun 2014; Dunn 2005; Eden 2011; Friedmann and McNair 2008; Tanaka and Busch 2003), as well as to issues of the production (Eyhorn et al. 2007; Seshia Galvin 2011) and consumption (Batte et al. 2007; Goodman 2013; Guthman 2001, 2008) of organic commodities. However, to date there has been very little literature addressing the production and circulation of agricultural knowledge within these global agro-food systems (as two exceptions, see Anderson 2009; Goldman et al. 2011).

This paper is based on qualitative data that was gathered during fieldwork conducted in Pakistan in 2013 and 2014. Preliminary findings have shown that a “systemic bias” (Morgan and Murdoch 2000) against alternative, organic agriculture necessitates close cooperation between the actors involved in it. Despite these challenges, data analysis has shown that the number of both certified and noncertified organic producers has increased over the past years and is likely to continue to do so. Farmers, entrepreneurs, and researchers form a dynamic network from within which related knowledge is produced and circulated. The both economic and environmental benefits associated with COA not only influence producer’s choices but also stimulate the actors within this network to research alternative agriculture further.

This suggests that the market-oriented COA is, as posited by scholars, Janus-faced in nature. On the one hand, standards and regulations developed in the Global North govern organic agricultural fields in the Global South and can have an impact on smallholders, excluding them from or disciplining them through standards (Vandergeest 2009). On the other, the associated (economic and environmental) benefits of COA serve as a tool by which to legitimize this agrarian alternative and to stimulate further research on such agriculture.

I begin by discussing the term “knowledge” in the context of COA, before then analyzing how a systemic bias against organic agriculture necessitates close cooperation between the different actors involved in it. By using examples from my fieldwork I illustrate how the organic agriculture network in Pakistan is constituted, and highlight which actors currently play a pivotal role in the production and circulation of related knowledge. Following on, I then describe in detail the development of COA in Pakistan.

Methods and data

Certified organic producers are spread over all five of Pakistan’s provinces (Sindh, Balochistan, Punjab, Khyber Pakhtunkhwa, and Gilgit-Baltistan). My research focuses specifically on the cities of Islamabad and Lahore, on agricultural universities in Faisalabad and Rawalpindi, as well as on producers in Northern Punjab and

Gilgit-Baltistan (and on related export firms). The two cities were selected because farmers' markets have recently been established in both, serving as small domestic outlets for the sale of organic food. The field research was conducted in 2013 and 2014, and the data collection methods used included participant observation as well as expert interviews and standardized questionnaires.

The group of producers visited comprised: (1) peri-urban farmers (Islamabad, Lahore) who were interested in obtaining organic certification but who still lacked the knowledge and financial means to do that; (2) certified producers in Northern Punjab; and, (3) certified producers in the districts of Hunza, Skardu, and Khaplu in Gilgit-Baltistan. In Northern Punjab, these are predominantly landlords with large landholdings whose agricultural lands are farmed by sharecroppers and wage laborers.³ Sugar, rice, and mangoes are the main organic food crops harvested in this growing area. Producers in Gilgit-Baltistan farm their own land and sell their products through an export firm — which bears the certification costs — via a local collector. The certified organic food crops grown in this area include nut trees, fruit trees, licorice, and sea buckthorn.

In addition to the growing areas, three processing facilities for both domestically consumed and exported organic food items in Lahore and Gilgit were visited. Expert interviews were conducted with members of the National Agricultural Research Council (NARC) in Islamabad and of its branches in Skardu and Khaplu, scholars from ARID Agricultural University in Rawalpindi and Quaid-e-Azam University in Islamabad, an employee from a certification body in Lahore, the owner of a company that produces processed organic food for the domestic market in Lahore, exporters of certified organic commodities in Lahore and Gilgit, urban farmers in Lahore and Islamabad, as well as NGO workers in Islamabad and Gilgit. A number of certification bodies and export firms were furthermore interviewed at the BioFach held in Nuremberg in February 2014.⁴ The interviews concentrated on the core topics of my research: the history, development, and future of organic agriculture in Pakistan; the production and circulation of such agricultural knowledge and practices; market access for producers; the domestic and international market for certified organic food items from Pakistan; the motivating factors behind farmers shift to organic agriculture; the manifestations of agrarian crisis in Pakistan; and, the challenges currently faced by COA in Pakistan.

Agricultural knowledge in the context of COA

“Knowledge” has for a long time been a highly debated term in social science scholarship on agriculture. Debates on concepts such as “indigenous knowledge” (Agrawal 1995; Altieri 1987; Gupta 1990) and “traditional ecological knowledge”

3 A sharecropper is “a tenant farmer who gives a part of each crop as rent” (Stevenson 2010: 1637).

4 BioFach, held annually in Nuremberg, is the world's largest fair for organic food, agriculture, policies, and marketing.

(Berkes et al. 1995) still to this day have an impact on Development Studies and on current discourses about environmental and agricultural knowledge (Baghel 2012; Ibert 2007; Sillitoe et al. 2005). In contrast to the static understanding of local knowledge found in the cited works of Agrawal, Altieri, and Berkes et al., recent scholarship on local — or “site-specific” — knowledge puts emphasis on the fact that it is produced in, and interacts with, a wider informational context (Nüsser and Baghel 2014).

Gibson-Graham and Roelvink (2010) as well as Lockyer and Veteto (2013) examine alternative economies and forms of agricultural production. They propose a critical way of engaging with such alternative agriculture and knowledge in the context of the ecological and social challenges faced at the dawn of the 21st century. In their writings they stress the belief that academic work should be “solution-focused rather than problem-oriented” (Lockyer and Veteto 2013: 2), and develop “Economic Ethics for the Anthropocene” (Gibson-Graham and Roelvink 2010). At the center of their argument lies a “hybrid research collective.” This can involve both a variety of human actors and nonhuman entities, who are all able to learn from their environment. Their analyses are not limited to the current scientific discourse.

This approach also corresponds with the concept of “generative networks” that Ingram (2007) introduces so as to explain how constellations of people involved in alternative agriculture in the US produce knowledge.⁵ She defines a generative network as the relationships between and activities of the various actors involved in a specific agrarian alternative (organic, ecoagriculture, and biodynamic (BD) farming) that produce what Latour (1986) calls “immutable mobiles.” These contain information that is unalterable when moved through time and (different social and cultural) spaces.

While the concept of generative networks offers a good tool with which to analyze knowledge production in the context of organic agriculture, the notion of immutable mobiles seems not to be applicable here. Such knowledge includes practical forms, and thus is not static. Especially in the context of the global spread of COA, information is certainly not unalterable. Though farmers need to adhere to international standards, their farming practices may still differ — particularly within different environmental conditions. In order to successfully implement COA on their fields, farmers need to first experiment with it — as well as to produce and circulate related knowledge.

The production of agricultural knowledge does not take place in a sealed-off scientific seed trial, but in villages, on fields, and in export firms and research institutes.

5 In contrast to the debates on local and indigenous knowledge, Gibson-Graham and Roelvink (2010), Ingram (2007), and Lockyer and Veteto (2013) do not speak of (two) separate knowledge systems (“Western” and local) but of networks that produce and circulate knowledge beyond the limits of the current scientific discourse. Depending on its scope, this knowledge can expand into and influence the dominant scientific discourse.

Practices are tested, discussed, and accepted or repudiated. Different actors have different interests, and hence contribute to the process of knowledge production according to their own agendas — making it a highly dynamic occurrence. The complexity of knowledge production has recently put environment-related forms at the center of Science and Technology Studies (STS) scholarship (Goldman and Turner 2011; Kloppenburg 2004; Latour 2004; Murphy et al. 2006; Yearley 2008). Goldman and Turner (2011) suggest that scholars should draw from both STS and Political Ecology (PE) in order to critically examine the processes of environmental knowledge production, application, and circulation. By merging STS and PE approaches, they develop an innovative framework within which to study these three processes — while critiquing the understanding of knowledge as a product that travels as a static entity.

Given the current discourses around the politicization of climate change as well as diverging claims in environmental politics, it is obvious that institutions and localities shape the application of and outcomes from the knowledge that has passed through them. Goldman and Turner stress this fact too, by saying that knowledge travels “through a myriad of different institutions before being “adapted” to the realities of the place of concern” (2011: 15). Likewise Anderson (2009) points to the fact that there are a lack of postcolonial approaches in STS, as possible ways to explain the travel and translation of science and technology in a globalized world. He criticizes STS scholarship for often fetishizing globalization and laments how only a few studies “describe how formal knowledge and practice travel, and what happens to them at their points of arrival, how they articulate across and within cultures” (Anderson 2009).⁶

In addition to addressing the production and circulation of knowledge, Anderson also uses the notion of the “translation of knowledge” — which is a crucial premise in the context of COA. Farmers need to comply with standards and regulations developed in the West, or even need to adhere to philosophies of farming — such as in the case of BD farming.⁷ But the translation of agricultural knowledge is not a one-way process. Rather, as Anderson puts it, it is an articulation with existing forms

6 In a study of one Punjab village in Pakistan in the 1980s, Kurin analyzed the encounter of “humoral agronomy as an indigenous system of knowledge” (1983: 292) with agricultural extension programs and found that farmers refused to incorporate exogenous agronomical models (technical and biochemical) into their cultivation practices. He observed that farmers only showed interest in new seeds and technologies when development projects made an effort to conflate indigenous and exogenous knowledge.

7 Rudolf Steiner’s anthroposophical lectures on agriculture in the 1920s first laid the foundations for BD farming. This type of agriculture developed out of a criticism of industrial farming, with it instead promoting a holistic understanding of the farm as a living organism — with animal husbandry being a central element therein. BD farming differs from other forms of organic agriculture, principally “as it has spiritual, mystical, and astrological impacts” (Kristiansen and Merfield 2006). Its farming practices include different preparations for composting and a special attention to cosmic rhythms during the sowing period (Leiber et al. 2006; Field Note, Heidelberg, June 20, 2013). Processed products bear the Demeter label.

of cultivation. To implement COA on the fields, farmers, exporters, and scholars experiment with new cultivars, fertilizers, and practices. The translation of agricultural knowledge in the context of COA is, therefore, inseparable from the processes of knowledge production and circulation.

The next chapter gives an overview of the major challenges to agricultural production in Pakistan in general, and then discusses in detail the issues faced there in knowledge production and circulation in the field of alternative agriculture in particular. Having access to such knowledge plays a central role in the decision to convert to COA, and represents one of the major obstacles encountered by both organic farmers and entrepreneurs in Pakistan.

Challenges to organic agriculture in Pakistan — a systemic bias against it?

Agriculture is one of the most important sectors of Pakistan's currently fragile economy. The country is one of the world's biggest exporters of rice, sugar, maize, wheat, cotton, onion, and pulses. Additionally the vast lands of the Indus plain comprise one of the largest irrigated areas anywhere in the world. In 2013 rural dwellers accounted for 63.1 percent of the total population and those working in agriculture constituted 38 percent of the country's total labor force. The fact that only 27.96 percent of Pakistan's total land mass is arable puts the importance of the country's agricultural sector into perspective (FAO 2013).

Pakistan was a central stage to the Green Revolution in the 1960s, and for a short period of time the introduction of new seeds, fertilizers, and technologies raised the country's yields of wheat and other food crops by more than 50 percent. Resource degradation as well as poor land tenure systems soon brought this productivity growth to a halt however. By 2001 resource degradation had reduced overall the productivity growth induced by technological changes by one-third (Murgai et al. 2001). Today, Pakistan is a significant exporter of agricultural food grain crops but lags far behind other countries in terms of actual yields (Shafi 2001; Khan 2006). In addition to the negative effects of resource degradation, traditional land tenure systems still hinder investment and innovation in Pakistani agriculture. The country's farmers often work as sharecroppers or wage laborers on landlords' fields. Several national reforms on land tenure, land taxation, as well as public infrastructure have tried to tackle these problems, but have so far failed to bring about any meaningful change in the agricultural sector.

Alongside these reforms, NGOs, international NGOs, and certain departments at agricultural universities are now involved in promoting changes in the country's agricultural production. The improvements envisioned range from productivity growth achieved through genetically modified organisms (GMOs) (Abid et al. 2011; Evenson 2005; Ivanic and Martin 2010), water management and profitability leveraged through the System of Rice Intensification (SRI) (Sharif 2011), to sustainable

agriculture (Baig and Shahid 2014) — and to, as is this paper's focus, certified organic agriculture (Rani et al. 2013).

In addition to challenges in agricultural production, meeting quality standards poses a major problem to agricultural exports from Pakistan. Fida and Zia (2013) examined the development of the citrus fruit value chain and found that, among other issues, products from Pakistan had been banned in Russia and other Central Asian states in 2005 due to the high residues of agrochemicals found in this produce. As a consequence, public–private partnership (PPP) projects were set up to implement Global Good Agricultural Practice (GlobalGAP) standards.⁸ The standards of GlobalGAP and of the International Organization for Standardization (ISO) have now become widespread practice in Pakistan. Not only food crops intended for export but also a growing number of fresh foods, such as vegetables and fruit sold in domestic supermarkets (like Metro, Al-Fatah), now either have GlobalGAP or ISO certification (Field Note, Islamabad, September 5, 2013). In comparison to GlobalGAP and ISO, COA currently only represents a small percentage of exported food crops — although the number of such producers has increased rapidly over the past years.

Similar to GlobalGAP and ISO, COA represents a relatively new approach to standardized agricultural production in Pakistan. While some entrepreneurs have been exporting organic commodities since the 1990s, significant interest in COA among producers, exporters, and researchers only really emerged after 2000. COA promotes environmentally friendly agriculture and could contribute to the rehabilitation of the depleted soils of agricultural heartlands such as those in Punjab, while at the same time providing quality assurances and access to international markets. All internationally certified food crops are currently exported to Europe and the US, while domestic demand for certified organic crops is rising only slowly among the urban populations of Lahore, Islamabad, and Karachi. For a few years now two domestic food labels — Daali Earthfoods and N'eco — have been selling processed organic food in certain supermarkets, and, since 2013, urban organic farmers' markets have taken place in Lahore and Islamabad on a regular basis. In a discussion regarding the dynamics of COA in Pakistan, the owner of an export firm confirmed this growing interest in and marketing of COA in Pakistan: “You come at a very good time. Seven, eight years ago people would have laughed at you” (Field Note, Lahore, September 10, 2013).

Still, actors in the organic agriculture network claim that national research institutes, policymakers, and scholars at agricultural universities are biased against organic agriculture. Morgan and Murdoch (2000) discuss the role of knowledge in the conversion of certain farmers to organic agriculture in the United Kingdom in the

8 GlobalGAP is a global private body that certifies the safe and sustainable production of food crops, and food processing. Standards are not as strict as organic ones, as they allow for a certain amount of chemical input to food production.

1990s. While older research suggests that a lack of knowledge had proved to be the main obstacle to such a conversion, they argue that a systemic bias against organic agriculture proves to be an even greater hurdle thereto. The notion of such a bias existing seems to be applicable to the Pakistan case too: it is an agrarian state, but despite the fact that producers struggle with the effects of an agrarian crisis that manifests itself in high fertilizer prices, environmental degradation, and subjection to international agroindustrial companies, solutions are sought from within the box of conventional and industrialized agriculture only. A scholar at the University of Agriculture in Faisalabad, who recently supervised a Ph.D. thesis on organic agriculture in the field of Resource Economics, remarked: "Organic farming is still a fantasy in this country." He stated that it is very difficult to acquire funds for research projects on organic agriculture because: "There is population pressure in Pakistan. Organic farming cannot feed the population; that is what people here at the university think" (Field Note, Faisalabad, April 18, 2014). This adverse attitude toward organic agriculture is visible on many levels in Pakistan; chemical fertilizer and pesticide companies lobby against development projects that promote organic agriculture on a large scale (Field Note, Lahore, March 21, 2014), organic farmers struggle to find support from within agricultural departments (Field Note, Lahore, April 4, 2014), and (most) employees at the Directorate of Organic Farming (DOF) at the NARC do not possess any specialist knowledge about organic agriculture (Field Note, Islamabad, April 30, 2014).⁹

In an interview with the owner of an export firm for certified organic products and the then chairperson of the DOF at the NARC on the development and future prospects of organic agriculture in Pakistan, the latter reported that there are a lot of reservations about organic agriculture lingering within the national institute. In his Ph.D., which he received in organic soil science from the Institute of Organic Agricultural Science at Kassel-Witzenhausen, Germany, he studied the effects of the microbial use of organic substrates in maize cultivation in Punjab. In our interview, he recollected what colleagues at the NARC had told him when he came back to Pakistan after finishing his studies and starting work at the DOF: "This research is for the richest countries, not for Pakistan. You have done the wrong job" (Field Note, Islamabad, September 27, 2013).

In his opinion, the bias against organic agriculture will require close cooperation to now emerge between the actors involved in it. He stated that: "There is very little support from the inner system but maximum support from the outer system" (Field Note, Islamabad, September 27, 2013). By this he means that drawing on his

9 The director of an NGO that promotes organic agriculture in the provinces of Khyber Pakhtunkhwa and Gilgit-Baltistan said in an interview that he faced challenges when he approached different agricultural departments for support. He reported that fertilizer companies had a high level of influence over these agricultural departments, and hence it was difficult for him to organize trainings on organic agriculture due to the opposition faced from within them (Field Note, Lahore, March 24, 2014).

connections especially with the private sector is necessary in order to realize projects based on organic agriculture and to gain knowledge about related markets and trends. Both him and the owner of the aforementioned export firm agreed that, in addition to the strong institutional reservations about organic agriculture, the political system in Pakistan is “totally corrupt” (Field Note, Islamabad, September 27, 2013), which negatively affects scientific practice and hinders development and innovation. They both discussed the recent surge in prices for chemical fertilizers and talked about their research on organic fertilizers and the manufacturing units installed at the NARC. This price surge has come to pose a major financial threat to Pakistani farmers. This situation has thus created an opportunity to promote the use of organic fertilizers instead. The owner of an export firm therefore stated that: “We have to work together to produce our results. We have to work together in another direction. At least we have the good people, the motivated people” (Field Note, Islamabad, September 27, 2013). He currently employs and funds a master’s student in soil science who is conducting research on organic fertilizers on the lands he owns in Swabi District (Khyber Pakhtunkhwa Province) and in Karbath (Punjab Province). He shares his results with the DOF chairperson, who has installed three manufacturing units at the DOF (for organic fertilizers, organic pesticides, and organic herbicides) (Field Note, Lahore, September 10, 2013). The exporter is convinced about the future success of this project, noting that: “This is our spot to promote organic: when the prices of conventional fertilizers increase” (Field Note, Islamabad, September 27, 2013).

This bias against organic agriculture described by the exporter, the DOF chairperson, and scholars alike appears on the level of institutionalized agricultural science and practice and stretches all the way from formal national institutions to agricultural universities. In addition to this prejudice in agronomy, there appears to be further bias on the level of agricultural production. First, the conversion to COA requires — from a producer’s perspective — sufficient knowledge, initial investment, and financial safeguarding for the transition period; certification costs as well as permanent land ownership are additional issues that have to be resolved.¹⁰ Despite the fact that COA can be very profitable for the producers, farmers rarely convert to it without external input. This is, initially, due to the difficulty of gaining access to knowledge and markets. At BioFach, a certifier who regularly visits Pakistan to inspect organic farms stated in an interview on the processes of conversion and certification that: “It is useless for smallholders to go for certified organic agriculture. They do not have

10 The transition period is the time that a producer needs to convert his farm from conventional to organic agriculture. The International Federation of Organic Agriculture Movements (IFOAM) defines the transition period as: “A suitable period of time prior to the organic status of a crop (during which healthy soils and sustainable ecosystems are being established). Common minimum time periods: (1) organic management for at least 12 months for annuals and 18 months for perennials; (2) 36 months since application of any inputs that do not accord with organic principles and applicable standards” (2011). Some labels also provide certification for the transition period.

access to the markets” (Field Note, Nuremberg, February 12, 2014). He reported that in most cases exporters approach farmers in regions where the crop in demand is grown and that the former then bear the certification costs. This was confirmed by the statement of an exporter of organic food from Pakistan, who said that: “We have to approach farmers. They do not know about organic — if you go one pace, people are lazy. We have to convince them” (Field Note, Nuremberg, February 12, 2014). He had been interested in COA since late 1995 and exported the first certified products in 2001. He reported that it took him some time until he could convince the first farmers to become involved in COA, because no one knew about it back then.

Second, agricultural innovation and experiment by smallholders have been hindered for such a long time due to the prevailing land tenure systems in Punjab.¹¹ These are still characterized by: (1) landlords with large landholdings whose land is farmed by sharecroppers and wage laborers and (2) smallholders with landholdings below 10 acres who are caught in a cycle of debt (Akhtar 2006; Martin 2009).¹² This means that producers are not free to decide on the crops grown and are not permanent landowners. Since residue-free soils are a fundamental prerequisite for achieving COA, farmers need permanent land ownership. In a discussion on who it is that actually converts to COA in Punjab, an NGO employee working in sustainable agriculture stated that it is mostly “the big landlords or feudal lords [...] because they have had that freedom to experiment on their land and implementing organic” (Field Note, Islamabad, September 26, 2013).

Even a prosperous urban farmer from Lahore had experienced the challenges of land management in Punjab. He rented land in the peri-urban areas of the city and converted it into an organic farm. He grew different vegetables (such as pumpkin, karela, cucumber), exported them to Europe, and had also exhibited these at the Grüne Woche event in Berlin in 2012.¹³ After the landowner had learned about his activities and convinced himself about the improved fertility of the soil, he did not extend the urban farmer’s tenure for the next year but decided to use the fields for his own purposes instead. The farmer, who had only been able to market his

11 The land tenure systems are a colonial legacy. While many land reforms have tried to tackle issues of land ownership since Pakistan’s independence, landlordism is still prevalent both in Punjab and in other provinces beside. While the official agricultural census only distinguishes three types of land ownership (owner; owner-cum-tenant; tenant), the reality on the ground is actually much more diverse (Akhtar 2006; Gazdar and Bux Mallah 2012; Government of Pakistan 2012).

12 A group interview was conducted with four smallholders neighboring an organic farming in the peri-urban areas of Lahore. All of them did not possess more than 5 acres of land and reported that they have to grow wheat on “every square foot.” They are indebted due to the high input costs and the government-set prices for wheat. They cannot afford to spare any space for producing their own seeds and depend on the chemical fertilizers and pesticides to safeguard the productivity of their cash crops (Field Note, Lahore, March 26, 2014).

13 The Grüne Woche takes place in Berlin annually. It is an international exhibition for the food, agricultural, and horticultural industries. It is also a forum for policymakers — in 2012 the prime minister of Punjab, Mian Shahbaz Sharif, attended the fair and stated in an interview that he planned to now promote organic agriculture in his region (Field Note, Lahore, September 14, 2013).

products for two years, had invested all his savings into this project and — due to the (financial and temporal) transition period requirements — was not able to start another one. Recalling the situation, he rued: “That is the bitter experience I got after running this whole show for two years. If I would have spent this money into purchasing the land it would have been much better” (Field Note, Lahore, September 13, 2013).

As the examples given above show, the actors involved in organic agriculture in Pakistan face challenges on different levels. Farmers lack practical and market knowledge, as well as — in the case of Punjab — land resources. Exporters need to convince producers, scholars, and policymakers alike to engage in COA so as to ensure that this form of agricultural production continues to spread. Additionally scholars and agricultural officers have to overcome the reservations about organic agriculture being harbored within national institutions. To overcome this bias in science and practice will require the close cooperation of farmers, scholars, export firms, and policymakers. Within this network, the production and circulation of knowledge plays a pivotal role for the diffusion of COA.

By drawing on examples from my fieldwork, the next chapter illustrates in greater detail the different processes of knowledge production and circulation within Pakistan’s organic agriculture network. The production of such knowledge is not limited to universities and research institutes but includes farmers’ and exporters’ activities as well. Induced by the economic and environmental benefits of COA, actors study market trends, conduct cultivar trials, and invest in organic fertilizer manufacturing and process chain development. Due to the aforementioned bias against organic agriculture, actors need to work together closely and circulate their related knowledge in order to help implement COA successfully countrywide in Pakistan.

Producing and circulating knowledge about organic agriculture in Pakistan

The network of actors involved in COA in Pakistan currently comprises producers, certification bodies, export firms, national agricultural departments, as well as agricultural universities. The greater organic network also includes urban farmers, urban farmers’ markets, NGOs, as well as the media. The latter have no interest in international organic certification (at least as yet), but are interlinked with the other members of that organic network by being part of the exchange of knowledge about COA farming practices, related fertilizer innovations, and the environmental benefits thereof. Some of the country’s urban and noncertified farmers are very innovative in their experimenting with many different alternative practices and fertilizers, and try to translate a variety of models of (certified) organic agriculture into practice on their farms.

Issues of translation not only include agronomic questions of appropriate climate and crops, but also questions of transcultural translation — as in the case of the

preparations required in BD farming. One specific field preparation, applied to improve and maintain soil fertility, is the burial of a cow horn (the number of horns to be buried depends on the size of the field) filled with cow dung in early autumn, with it staying in the soil until Easter the following year. The content is then mixed with a certain amount of water and applied to the field (Steiner 1984; Wistinghausen et al. 1998). In a discussion about this form of preparation, which is applied at a biodynamic farm nearby Lahore, my research assistant argued that this practice is not halal and hence Muslims cannot consume the crops that are grown on this field (Field Note, Lahore, September 11, 2013).

Other labels (Naturland, USDA NOP) do not stipulate special preparations, and thus do not pose a challenge to transcultural translation. Still, producers and exporters need to acquire knowledge about specific cultivars, about soil fertility, and about processing requirements. The following chapter briefly describes the different actors involved in Pakistan's organic agriculture and analyzes how they produce and circulate knowledge about it.

Producers

As described above, the producers of certified organic crops are all different kinds of farmers — who seem to convert to COA primarily for its economic and ecological benefits. Some of the organic farmers with larger landholdings in the agricultural heartland of Punjab have turned their organic farms into centers of innovation and experimentation (Field Note, Lahore, September 10, 2013; Field Note, Islamabad, September 26, 2013; Field Note, Faisalabad, April 19, 2014). For example, two noncertified peri-urban organic farmers in Punjab (Faisalabad and Lahore) visited in 2013 and 2014 both possessed the financial means to experiment with innovative crops (for example quinoa, asparagus) and farming practices (such as new planting techniques, the manufacturing of organic fertilizers). In contrast to the producers in the country's western and northern mountainous provinces, they have access to knowledge about organic agriculture markets and practices and either communicate with the certification bodies directly or search for knowledge on the internet — such as on blogs run by organic farmers in the Indian Punjab. Still, due to nonexistent formal knowledge resources for organic agriculture they say that it is difficult for them to acquire essential information about topics such as seeds, market demand, and, in particular, certification procedures. One noncertified farmer from Lahore lamented: “I want to get a certification. But I do not know who to ask. Nobody can tell me about the requirements” (Field Note, Lahore, March 26, 2014). The recently established farmers' markets in Islamabad and Lahore (more on these in due course) serve as a good platform for the exchange of such knowledge between the (peri-urban) farmers.

Figure 1: Manufacturing of organic pesticide (neem, tobacco, garlic, chilies) on an organic farm in Lahore. The farmer found the instructions on the internet



Source: Author's own compilation.

In Gilgit-Baltistan, meanwhile, producers rely on export firms to gain access to organic agriculture markets and knowledge. The private sector plays a pivotal role in related knowledge production and circulation in these areas. Export firms, in cooperation with NGOs and district-level agricultural departments, conduct training sessions to teach farmers about the successful storage, processing, and marketing of cash crops. In this area the latter comprise fruit and nut trees as well as niche products such as sea buckthorn and licorice. In Gilgit-Baltistan's isolated districts of Hunza and Skardu, located in the high mountains, organic farmers have to face manifold challenges that range from knowledge access and transportation issues to dependency on export firms. There, an NGO that has hitherto been actively involved in the promotion of organic farming has put a lot of effort into training farmers on related farming practices (for example on the manufacturing of fertilizers and pesticides), but has been unable to create a link between the farmers and the market. Farmers therefore rely on export firms to obtain certification and so as to connect to the market. Group certifications based on Participatory Guarantee Systems (PGS) for small-scale growers have so far failed to connect farmers to the market directly, as they reported that the administrative paperwork involved was just too difficult to manage (Field Note, Haiderabad, May 18, 2014). This can create a risky situation

for farmers as they have to trust the export firms in terms of what constitutes current market demand. The field research in 2014 revealed two very different examples: while one export firm in Hunza District regularly does not collect the preordered produce from the farmers and does not offer any training to them, another one operating in Skardu District provides farmers with new seed varieties and conducts training sessions on processing and marketing. A certified organic farmer who sells his products to this export firm reported that: “He [the exporter] has a good knowledge of the market, he has seen the world. We trust him. Other businessmen here are just locals, they do not know about the international demand” (Field Note, Kachura, May 29, 2014).

Figure 2: A “seed factory” on an organic farm in Lahore. Only few farmers can spare room for the reproduction of seeds.



Source: Author's own compilation.

Agricultural universities

Pakistan is an agrarian state, and hence home to established agricultural universities. ARID University, the University of Agriculture in Faisalabad (UAF), and the Bahauddin Zakariya University in Multan all conduct research on organic agriculture. While ARID University has close links with the NARC in Islamabad, the UAF has strong international connections and furthermore works together with overseas donors so as to facilitate development projects.

Scholars from the Horticulture Institute at the UAF are currently working together with an export firm to conduct research on certified organic rose oil production. The climatic conditions in Punjab and Baltistan are favorable for rose production and, currently, conventional cut rose production is increasing in Punjab. However due to the high volume of pesticides used in conventional rose production, such farmers are now faced with soil degradation — alongside having potential issues with exporters due to various transportation and processing challenges (Ahmad et al. 2010). Certified organic rose oil is currently in high demand for the international cosmetic industry. Due to the need for test fields and research on organic fertilizers, scholars from the UAF are part of a project to introduce this crop for high-end markets in Pakistan. They are working together with an export firm that will facilitate the marketing of the products in Europe and the US (Field Note, Lahore, September 10, 2013; Field Note, Faisalabad, April 20, 2014).

The UAF is also involved in a research project and (future) organic model farm situated close to Faisalabad. The owner of the farm is currently converting his 220 acres into organic lands and also plans to get official certification for that. Through this link, UAF scholars are able to experiment with planting techniques and natural fertilizers that mostly consist of the on-farm biogas plant and of sugarcane waste (Field Note, Faisalabad, April 18–22, 2014). As mentioned earlier, scholars frequently reported that they struggle to acquire funds for research on organic agriculture — that despite their close links with the private sector and members of the NARC (Field Note, Lahore, September 11, 2013; Field Note, Faisalabad, April 18, 2014).

The DOF at the NARC

At the NARC, the DOF has so far struggled to be a key part of this official and influential body. Still, over the past years demonstrations of successful organic crop production and organic pest management have been held on NARC grounds, three manufacturing units have been installed (for organic fertilizer, organic pesticide, and organic herbicide), and consultants have reached out to both rural and urban farmers to better train them on organic farming practices (Field Note, Islamabad, September 8, 2013; Field Note, Islamabad, September 27, 2013; PARC 2014).

The growing interest in organic fertilizers is partly due to the fact that, as mentioned above, the price of their chemical counterparts has soared over the past years. In an interview with the then chairperson of DOF a few years back, he revealed that he himself did not originally believe in the need to search for alternative fertilizers. He recounted that: “My professor in Germany used to say: ‘Gentlemen, in the future the agricultural revolution will only occur when there is an end of phosphorus.’ I used to say my professor is crazy. When I came back — it was just [a] five-year margin — there was a phosphorus deficiency. Phosphorus fertilizer has gone up to 5000 Pakistani rupees per bag (or 50kg). Similarly is urea, it is about 1800 to 2000 rupees

per bag, which used to be 300 rupees when I left this country” (Field Note, Islamabad, September 27, 2013). As mentioned above, he had established close links with scholars and the private sector because of the opposition he had to face from within the NARC.

However, interviews with both past and present members of the DOF as well as with organic farmers who used its consulting services have revealed that the influence of the directorate has been very dependent on who its chairperson is at the time (Field Note, Islamabad, September 8, 2013; Field Note, Lahore, April 3, 2014). Along with the majority of the directorate’s staff, even the current chairperson of the DOF does not have a background in organic agriculture and has not followed up on the older projects of the institute. The problem with this situation became obvious on a personal visit to the DOF in April 2014, when representatives of an organic farmers group from Bahawalpur in Southern Punjab were also there to gain knowledge about marketing and reproducible seeds. One representative of the organization, which has been producing organically for a few years now, commented: “If we get to know about marketing, then organic [agriculture] will have a future” (Field Note, Islamabad, April 30, 2014). None of the employees at the DOF were able to offer advice on reproducible seeds or marketing and referred them to the Institute of Crop Sciences at the NARC instead. The seeming lack of interest in organic agriculture on the part of the institute responsible for it exemplifies the bias against it that is currently prevalent within Pakistani governmental institutions.

Private sector

The private sector comprises certification bodies, export firms, and entrepreneurs. Certification bodies examine their approved organic farms annually and, if something gives cause for suspicion, they take soil and grain samples away for laboratory testing. Several certification bodies are currently present in Pakistan, but only the Control Union (CU) and the Institute for Market Ecology (IMO) certify organic food crops as things stand. In most cases, export firms commission the certification procedure and bear the costs thereof (Field Note, Nuremberg, February 12, 2014). Some products do not require testing because they are “organic by default,” as was reported by one certifier (Field Note, Lahore, September 13, 2013).¹⁴ Certification bodies are disconnected from the farmers in terms of knowledge circulation, because they are not obliged to consult with farmers on the certification process. Farmers

14 In an interview on the certification process, he gave the example of pine in Waziristan — where farmers harvest pinecones from naturally grown pine forests. The processed, noncertified pine nuts have been exported to Europe for the past decade by an export firm in Lahore. In 2013 their European buyers asked for certified organic pine nuts. In this case, the certification process only included the certifier’s visit to the growing area and an examination of the processing chain. The certifier therefore describes COA as “customer-oriented,” and the spread of it as driven by market demand (Field Note, Lahore, September 13, 2013).

hence depend on “knowledge brokers” and export firms to gather and share knowledge about such certification.¹⁵

Export firms have been dealing in organic food for two decades now, but only recently has COA become more widespread. The owner of an export firm reported that, when he first became active in the 1990s, COA was not known in Pakistan: “When I started, there was no knowledge of an organic market in Pakistan. I was the facilitator to the farmers for [the] local, national, and export markets” (Field Note, Lahore, September 10, 2013). Despite the rapid growth of COA, export firms still play a pivotal role in the dissemination of knowledge about such agriculture. They have close links with the other network actors involved, and help farmers connect with international markets. By investing in the development of the process chain as well as providing training for both farmers and district staff, export firms are thus key contributors to the ongoing emergence of COA in Pakistan.

Over the past few years, some entrepreneurs have also started to process organic food for the domestic market. There is a small but growing demand for organic and certified food among Pakistan’s urban population.¹⁶ The produce (rice, flour, sugar, spices, and some processed food items) sold in supermarkets and at urban farmers’ markets is not certified by international organic standards, but does comply with the standards of GlobalGAP and ISO. Still, entrepreneurs self-label their products “organic” for marketing purposes. One reason for the growing demand for such goods is the quality issues of food products in Pakistan, as illustrated in the earlier example of significant pesticide residues in harvested citrus fruits. An entrepreneur from Lahore founded, together with a friend, her own food label because of these quality and health issues. In an interview, she reported how the experiences with local food processing chains drove them to start their own label:

Our kids were small and I wanted to give them healthy food. You know the roti that we eat — it was very white. That means that the flour content is high and the fiber content is very low. So I would go around all the local mills [...] and what I saw there was that they were throwing mothballs into the wheat [...]. They said it is not an issue at all, there is so much wheat [inside] — what are a few mothballs here and there? So one guy was doing this and the other guy at the other mill was throwing mercury. So I asked him what for — “it is for the rats.” So all the flour we were consuming had this and God knows what [in it]. So I did not dare to go to the next one. I had seen enough. So that is what prompted us into doing this (Field Note, Lahore, September 11, 2013).

15 To my knowledge, there is only one consulting company on organic agriculture in Lahore — it provides farmers and exporters with knowledge about organic farming practices and organic certification. However since they are not affiliated to the NARC or to any other official body beside, one has to find them instead via the internet — which thereby excludes most of the farmers in Punjab (Field Note, Lahore, April 23, 2014).

16 The conscious consumption of branded, certified, and organic food is still limited to the country’s urban population. The certification costs involved are reflected in the higher prices of such produce; as an NGO employee working on sustainable agriculture put it: “[The] local market is just not ready to purchase organic stuff, it is too expensive” (Field Note, Islamabad, September 26, 2013).

The growing domestic demand and the promising development of the export market have induced the DOF to recently start drafting (public) national organic standards. These might provide one tool for adding value to food crops and be an incentive to ensure the increasing of quality in food crops and processing. Many farmers and consumers interviewed at the farmers' markets supported this idea, because such standards would: (1) create a tool for improving trust in locally produced food crops among consumers and (2) mean an affordable alternative exists for Pakistani farmers to the expensive international certification procedures. Due to a lack of support within the NARC, the former chairperson of the DOF had asked instead private sector actors to cooperate with him in developing these standards. However in the wake of the recent staff turnover at the DOF, this knowledge-intensive process has not progressed much since December 2013 (Field Note, Islamabad, September 27, 2013; Field Note, Islamabad, April 30, 2014).

Farmers' markets and the media

Agrarian and environmental issues hold little space on the Pakistani public agenda, perhaps due to the paralyzing effect of everyday violence and ongoing political power struggles in the country. However, organic agriculture has recently become present in the media. Different English-language newspapers (*Dawn*, *The News*, *Tribune*) cover the farmers' markets in Islamabad and Lahore and report on the development of consumer demand. Media coverage of organic agriculture has increased and changed in terms of quality. For example, while in 2010 an article entitled "Promoting Organic Farming" (*InPaperMagazine* 2010) had to explain to the reader the basic underlying concept of organic farming, recent articles have discussed issues of organic agriculture in detail — such as in the article "Demand for Organic Vegetables Increases" (Ashgar 2013).

The two farmers' markets concerned, the Kuch Khaas Farmers' Market in Islamabad and the Khalis Food Market in Lahore, have taken place weekly and monthly respectively since the summer of 2013 and have become a meeting point for urban farmers. Both have developed into vibrant platforms for organic agriculture and organic food. Beside processed and unprocessed food (including live animals), exhibitors also display farming practices as well as processing and marketing techniques and exchange knowledge with each other. In Islamabad, for example, urban farmers use the weekly meetings to form business partnerships and exchange knowledge about consultant reports from the NARC or marketing ideas. These markets represent the first domestic ones for both certified and uncertified organic food; in both cities, home delivery services (for organic vegetables, dairy products, eggs, meat) are now available. Consumers can order online (<http://www.khalis.pk> for Lahore) or via phone and Facebook (Isloo Fresh for Islamabad).

Figures 3 and 4: Farmers' markets in Lahore and Islamabad



Note: Currently, the relationship of farmers and consumers at the farmers' markets in Lahore (Photo 3) and Islamabad (Photo 4) is built on trust alone.

Source: Author's own images.

As the examples given show, the actors involved in Pakistan's organic agriculture network are closely interlinked and rely on each other to successfully implement COA in the country. Without additional research and the provision of land resources at the DOF and at the country's universities, private sector actors will continue to face challenges in their conducting of the research now needed on specific cultivars and fertilizers. On the other hand, producers and public institutions lack funding — and knowledge for food processing, navigating markets, as well as accessing them in general. They rely on the private sector and urban farmers to remain informed about any international developments. The circulation and production of knowledge are therefore playing a central role in Pakistan's dynamic, expanding organic agriculture network.

Conclusion

Despite the numerous challenges faced in agricultural science and practice, COA still represents a fast-growing agrarian alternative in Pakistan. Scholars and members of national research bodies have difficulties in funding their related research projects though, while producers and exporters of certified organic crops have to tackle problems of land ownership and poor infrastructural conditions. Most importantly, the actors concerned need to have knowledge about related markets and farming practices if they are to successfully implement COA on their fields. As the examples given in this paper have shown, these actors work closely together in order to produce and circulate knowledge about organic agriculture. This they do in order to help translate into the Pakistani context the standards and regulations of globally circulating models of COA. It is important to focus on these processes of knowledge articulation in the context of STS, and to examine how globally travelling agricultural knowledge associates and interacts with existing forms of crop cultivation. As

the case of COA in Pakistan shows, it is cardinaly important both to analyze the processes of knowledge production and to follow more closely its circulation in the producer country if we are to better understand how such knowledge travels — and to identify which of its related practices take hold, and how.

In contrast to other forms of alternative agriculture, COA represents a market-driven form of agrarian production. In these times of agrarian crisis — as manifest in ecological and economic threats, soaring prices for chemical fertilizers, and issues of quality vis-à-vis Pakistani food (exports) — COA proves a promising alternative to conventional, pesticide-intensive agriculture. The Janus-faced nature of the market-driven COA is evident now and will probably become even more visible in the future. On the one hand, standards and regulations can have disciplinary and exclusionary effects on farmers. On the other, however, the economic and environmental benefits associated with COA legitimize this agrarian alternative and stimulate research on alternative, organic agriculture at Pakistani universities and in the country's national research bodies.

The rapid growth of COA and growing concerns over healthy and ecologically just food in Pakistan have also recently induced the country's urban population to engage in "green consumerism," and as part of this to establish farmers' markets. With ISO- and GlobalGAP-certified fresh and processed foods already available in certain Pakistani supermarkets, it is likely that internationally certified organic food will soon enter the domestic market too. Furthermore, the introduction of national organic standards — in combination with growing consumer demand — could motivate more Pakistani farmers to shift to organic agriculture in the near future, thereby creating a larger network for the exchange of knowledge on alternative agriculture.

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