



Taking agroecology to scale: the Zero Budget Natural Farming peasant movement in Karnataka, India

Ashlesha Khadse, Peter Michael Rosset, Helda Morales & Bruce G. Ferguson

To cite this article: Ashlesha Khadse, Peter Michael Rosset, Helda Morales & Bruce G. Ferguson (2017): Taking agroecology to scale: the Zero Budget Natural Farming peasant movement in Karnataka, India, The Journal of Peasant Studies, DOI: [10.1080/03066150.2016.1276450](https://doi.org/10.1080/03066150.2016.1276450)

To link to this article: <http://dx.doi.org/10.1080/03066150.2016.1276450>



Published online: 14 Feb 2017.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)

Taking agroecology to scale: the Zero Budget Natural Farming peasant movement in Karnataka, India

Ashlesha Khadse, Peter Michael Rosset, Helda Morales and Bruce G. Ferguson

This paper analyzes how peasant movements scale up agroecology. It specifically examines Zero Budget Natural Farming (ZBNF), a grassroots peasant agroecology movement in Karnataka, India. ZBNF ends reliance on purchased inputs and loans for farming, positioning itself as a solution to extreme indebtedness and suicides among Indian farmers. The ZBNF movement has achieved massive scale not only because of effective farming practices, but because of a social movement dynamic – motivating members through discourse, mobilizing resources from allies, self-organized pedagogical activities, charismatic and local leadership, and generating a spirit of volunteerism among its members. This paper was produced as part of a self-study process in La Via Campesina, the global peasant movement.

Keywords: agroecology; KRRS; La Via Campesina; scaling-up agroecology; Subhash Palekar; Zero Budget Natural Farming

Introduction

There is a growing call to scale up agroecology from various sectors – intergovernmental bodies like the Food and Agriculture Organization of the United Nations (FAO), social movements like La Via Campesina (LVC), scientists and civil society organizations (Parmentier 2014; La Via Campesina 2013; Altieri, Nicholls, and Funes 2012; Rosset 2015; FAO 2015). This is because of the inherent unsustainability of industrial agriculture and its contributions to the ecological and agrarian crises, and to hunger. Based on empirical and scientific evidence, the growing consensus is that agroecologically diverse farming not only is more productive, but also brings a host of ecological and social benefits (Parmentier 2014; De Schutter 2010; Varghese and Hansen-Kuhn 2013; Rosset and Martínez-Torres 2012; Altieri and Nicholls 2008; Badgley et al. 2007; Pretty, Morison, and Hine 2003; Altieri and Koohafkan 2008; Van der Ploeg 2008; IAASTD 2009; Altieri and Toledo 2011).

Our understanding of how to scale up agroecology is nascent. We believe that there has been a tendency to privilege investigation on the technical aspects of agroecology, while research on its social aspects remains weaker (Rosset 2015; Rosset et al. 2011). Agroecology is not just a set of farming practices, or a scientific discipline based on ecological theory, but also a growing social movement (Wezel et al. 2009). Analyzing the social aspects of agroecology can provide critical insight into how to achieve scale.

In many cases, peasant movements have played a major part in taking agroecology to scale, but their role has not been amply analyzed so far. The global peasant movement LVC has adopted agroecology as one of its key tools to achieve food sovereignty and has proven

to be an important venue for its scaling-up (Rosset and Martínez-Torres 2012; La Via Campesina 2013). LVC has diverse agroecology experiences such as formal farmer-to-farmer processes, cooperatives and more than 40 agroecology schools, and has gained a few favorable public policies in Asia, Africa, Latin America and Europe (La Via Campesina 2013).

In order to have a clearer understanding of the main factors behind how peasant movements scale up agroecology, LVC is carrying out self-studies directed at systematizing successful scaling-up experiences protagonized by peasant movements. This process aims to create didactic resources for peasants' organizations (La Via Campesina 2013). It has already done one such study in Cuba, where the national small peasants' organization *Asociación Nacional de Agricultores Pequeños* (ANAP) played the key role in the *Campesino a Campesino* (CaC – farmer to farmer) movement through which half the peasant families of Cuba have transformed their production methods towards agroecology. This enormous feat was possible because ANAP decided to transform a non-governmental organization-funded CaC project into a social movement. The Cuba case shows that peasant movements bring an advantage to the scaling-up process – they can create autocatalytic social processes that primarily depend on internal logic rather than external funding or project support, they ignite peasant protagonism and encourage local leadership, they have the ability to mobilize their members, and they can achieve wide territorial reach and legitimacy in society (Machín Sosa et al. 2013; Rosset et al. 2011).

This paper, also part of LVC's self-study process, will look at another peasant movement that has successfully taken agroecology to scale, in southern India. The Zero Budget Natural Farming (ZBNF) Movement, also called the Zero Budget Spiritual Farming Movement, has spread at varying levels to most Indian states. It has especially achieved scale in the southern Indian states of Tamil Nadu, Andhra Pradesh and Kerala, though it is in the state of Karnataka where it first gained popularity, and where the research for this paper was carried out.¹ Many members of the Karnataka Rajya Raitha Sangha (KRRS), a powerful middle peasant organization in India (Assadi 1994; Brass 1994), are also members of ZBNF.² KRRS is an LVC member, and one of the strongest allies of ZBNF. KRRS promotes ZBNF in both discourse and practice. It has recently opened a peasant agroecology school where its members receive training on ZBNF methods.³ The basic 'toolkit' of ZBNF methods was put together by Subhash Palekar, an agricultural scientist, disillusioned by the ill effects of the green revolution on his own family farm, who drew from extensive research and observation of ecological processes and indigenous

¹The research for this paper was carried out from 2012 to 2015 and included three team visits and one individual field visit by LVC members and allied researchers. The methods included a questionnaire administered to 97 farmers in 2012, four focus groups ranging from 10 to 40 farmers, and 31 in-depth semi-structured interviews with farmers, ZBNF leaders and KRRS leaders in seven districts of Karnataka, as well as participation in a five-day ZBNF training camp in 2012 in Tumkur district, Karnataka. Farmers were selected for interviews based on recommendations from KRRS and ZBNF leaders as well as referrals from farmers themselves. We also randomly selected and interviewed farmers at the ZBNF training camp. Focus groups were organized by local KRRS or ZBNF leaders who sent out an open invitation to neighboring ZBNF farmers interested in attending. We carried out semi-structured group discussions at these focus groups. Questionnaires were administered to farmers at focus groups as well as to farmers we encountered in ZBNF training camps. We also reviewed books, news articles, social media and academic literature.

²The middle peasantry refers to the class of peasants that is economically independent, owns land and mainly depends on its own labor and resources (Alavi 1965; Wolf 1969).

³The Amrita Bhoomi Center (<http://www.amritabhoomi.org>) is part of LVC's global peasant schools network.

farming methods during his work as an extension officer in the 1990s (Palekar 2016). Palekar dedicates himself to teaching ZBNF at massive training camps across the country, and is its principal resource person or *guru*, as ZBNF members call him.

'Zero budget' natural farming aims to drastically cut production costs by ending dependence on all outside inputs and loans for farming. The word 'budget' refers to credit and expenses; thus, the phrase 'zero budget' means without using any credit, and without spending any money on purchased inputs. 'Natural farming' means farming *with* Nature and *without* chemicals. ZBNF is positioned by its advocates as a solution to the agrarian crisis and rising trend of farmer suicides in India (Palekar 2005, 2006, n.d.). Various studies point to indebtedness from increasing costs of green revolution inputs as well as low incomes due to declining market prices as some of the key drivers of the agrarian crisis and farmer suicides in India (Mohanty 2005; Vyas 2005; Misra 2008; Vakulabharam 2013).

ZBNF is possibly one of the most successful agroecology movements globally, in terms of its reach. The movement's leaders claim that millions practice ZBNF at the national level, while a rough estimation for just Karnataka puts the figure there at around 100,000.⁴ The ZBNF movement has organized some 60 massive state-level training camps in the last decade, with an average of 1000–2000 farmer participants, including women, men and youths. Most districts have a local self-organized dynamic to promote ZBNF at the grassroots level. All this has been achieved without any formal movement organization, paid staff or even a bank account. ZBNF generates a spirit of volunteerism and enthusiasm among its peasant farmer members, who are the main protagonists of the movement.

We argue that ZBNF has attained scale in Karnataka because of a social movement dynamic created via the classic tasks carried out by social movements, such as mobilization of a range of resources both internally and from allies, charismatic leadership, effective framing and self-organized processes such as pedagogical activities. This has transformed ZBNF from a largely unknown farming method into a massive grassroots social movement. A necessary factor, though not sufficient in itself, is that the ZBNF farming practices function well in both agronomical and economic terms.

We begin by enumerating key factors that can contribute to scaling up agroecology, based on a review of successful cases in the literature. Next we discuss social movement theories that could help to understand these factors. We profile the ZBNF movement and analyze it in light of the factors and theories discussed.

Factors and theories useful to analyze the scaling-up of agroecology⁵:

- *Horizontal pedagogical processes*: The farmer-to-farmer methodology (CaC in Spanish) was a key strategy for peasant organizations in Latin America to take agroecology to scale (Holt-Giménez 2006). Based on Freire's (1971) educational

⁴A ZBNF leader based this estimate on the number of training camps conducted in the last 10 years in the state. At least 60,000–100,000 farmers have attended training camps directly, which were, according to our interviewees, a key experience that motivated farmers to transition to ZBNF. While not every camp attendee switches to ZBNF, many farmers adopt ZBNF even without having attended the camp – what ZBNF leaders call 'indirect conversion'. Many farmers adopt just one or two ZBNF practices to combine with other methods. Thus, a modest estimation could put the figure at 100,000. Even without the availability of an official number, ZBNF's popularity is evident. It is the subject of numerous books, blogs, photos, websites, and social and mainstream media coverage.

⁵We have primarily looked at those documented cases of large-scale agroecology adoption where mass-based farmers' movements have been the protagonists in the scaling-up process.

philosophy, CaC counters the traditional top-down extension approach which seeks to replace peasant knowledge with purchased inputs, viewing the peasant as a passive recipient. CaC instead promotes peasant protagonism and enthusiasm through a horizontal learning experience, where farmers themselves are both students and teachers, and education is a collective process of reflection and action (Holt-Giménez 2006; Rosset et al. 2011).

CaC's success in Mesoamerica has been documented by Eric Holt-Gimenez (2006), while its achievements in Cuba have been detailed in Machín Sosa et al. (2013). Farmer Field Schools,⁶ another successful model of horizontal pedagogy, are part of many scaling-up processes in Asia (Gallagher 2003).

- *Favorable public policy*: Supportive policies address procurement, credit, education, research, extension and commercialization. For example, the Brazilian government has national programs that privilege local family farmers and offer up to 30 percent higher prices for agroecological farmers to supply school meal plans⁷ (Nehring and McKay 2014). In India, the Community Managed Sustainable Agriculture program in the state of Andhra Pradesh, where 300,000 farmers are practicing non-pesticide management, has benefited from state support (Kumara et al. 2009).
- *Local and favorable markets*: Networks of consumers and producers, such as community-supported agriculture networks in the USA, *Associations pour le maintien d'une agriculture Paysanne* in France, or the Rede Ecovida in Brazil, have played a key role in providing support to agroecological producers (Altieri, Nicholls, and Funes 2012; Lamine, Darolt, and Brandenburg 2012). The Movimento Sem Terra⁸ in Brazil has created 400 cooperatives, some of which are principally dedicated to agroecology (Friends of the MST 2015). The Timbaktu Collective of India, linked to some 20,000 farming families, has set up a marketing cooperative to promote agroecology (The Timbaktu Collective 2015).
- *Social organization–social movements*: Community organizations and rural social movements serve as the culture medium upon which agroecology can spread. The experience of peasant movements indicates that the degree of organization (called 'organicity' by social movements), and the extent to which horizontal social methodologies based on peasant protagonism are employed to collectively construct social processes, are key factors in bringing agroecology to scale (Rosset et al. 2011; Martínez-Torres and Rosset 2014; McCune 2014; Kumara et al. 2009; Holt-Giménez 2006; Rosset 2015).
- *Farming practices that work*: Agroecology cannot spread based solely on social processes. Any process must be based on agroecological farming practices and principles that provide farmers with good results – that are 'solutions' to problems or obstacles that farmers face (Machín Sosa et al. 2013; Rosset et al. 2011; Holt-Giménez 2006; Kolmans 2006). These practices are not necessarily the product of formal research institutions. In fact, they are just as likely to come from peasant innovation and traditional knowledge.

⁶Originally initiated by the FAO to promote integrated pest management, these bring farmers together in regular study circles to carry out collective observation, analysis and reflection.

⁷Two such programs are Programa de Adquisición de Alimentos (National Food Procurement Program), and the Programa Nacional de Alimentação Escolar (National School Feeding Program) (Nehring and McKay 2014).

⁸The Landless Workers Movement of Brazil.

Social movement theory has converged around three major perspectives – resource mobilization, political opportunities and framing. Resource mobilization theory (McCarthy and Zald 1977; Tilly 1978; Gamson 1975; Oberschall 1973) privileges the availability of resources to social movements. It examines the social context in which movements operate, whether resources are available in society and whether the movement is able to aggregate them for collective goals. Resources are mobilized from outside groups such as allies, and also internally by the movement (Edwards and Kane 2014). Based on Edwards and McCarthy's (2007) and Edwards and Kane's (2014) classifications, we list examples of the types of resources mobilized by peasant agroecology movements (see Table 1).

The political opportunity framework emphasizes political opportunities and constraints external to organizations. Movements arise not just because resources can be mobilized but also because political conditions are ripe (Eisinger 1973). Examples of political opportunities can include favorable public policies, a decline in repression, or new allies.

Framing processes focus primarily on how language, symbols, claims and identities are deployed in the pursuit of activism (Snow, Soule, and Kriesi 2004). These are used mainly to create meanings, and social movements always engage in what some have called the politics of signification (Hall 1982).

Core framing tasks carried out by social movements aim to diagnose the social problem (diagnostic framing), specify the solution and the form of necessary collective action (prognostic framing), and mobilize for social change or a call to action (motivational framing) (Benford and Snow 2000). Ideology and frames are closely related; while ideology is content, frames are the process by which that content is conveyed (Oliver and Johnston 2000).

Movements adjust frames for 'cultural resonance' according to their audience, as some frames work better in certain cultural contexts. Resonance is determined by the credibility of the claim-makers, and by the relevance of the frames to the listeners' lives (Benford and Snow 2000). For example, in Cuba, agroecology has been promoted through frames related to the Cuban Revolution, using national symbols and heroes like José Martí and Che Guevara (Machín Sosa et al. 2013).

Rosset and Martínez-Torres (2012) and Martínez-Torres and Rosset (2014) distinguish between 'agroecology as *farming*' and 'agroecology as *framing*'. While agroecology must 'work' as farming, the social process of dissemination and adoption is often driven just as

Table 1. Resources mobilized by peasant agroecology movements.

Type of resource	Examples
Social, organizational	Creation of a movement organization that implements a social process methodology, such as creating farmers groups dedicated to training (e.g. CaC, farmer field schools), formation of cooperatives to sell agroecological produce, or building marketing networks with consumers.
Material	Funding from governments, NGOs, members, donated accommodations, food, and space for training activities.
Cultural	Frames, traditional peasant knowledge, music, literature, blogs, web pages, books and films/videos.
Moral	Legitimacy, such as endorsements by churches or government, solidarity from consumers or celebrities, awards.
Human	Charismatic leaders, organizational leaders, local champions (i.e. successful agroecological farmers), volunteers, members, cadre and militants.

much by the psychological and emotional factors that motivate people. Peasant movements routinely engage in politics of contestation in the material world – such as conflicts over land or seeds. They also do so in the immaterial world, via discursive struggles, generating support for peasant agriculture in society (Rosset and Martínez-Torres 2012).

The issue of leadership, key to agroecology movements, remains under-theorized in social movement studies. General ideas on leadership deal with leaders' roles and functions: they mobilize, organize, articulate issues, create frames, build organizations, set goals and inspire, among other tasks (Morris and Staggenborg 2004).

Weber's theory on charismatic authority suggests that leaders gain legitimacy in movements because followers assign charisma to leaders whose personal magnetism serves as a recruiting force (Weber 1968). Weber failed to articulate the agency of followers, however, characterizing them as blind followers (Melucci 1996).

Ganz highlights the impact of organization on the emergence of leaders. Social movements identify, recruit and develop leadership at all levels. This leadership forges a social movement community and mobilizes its resources, a primary source of social movement power (Ganz 2010).

A variety of leadership levels exist within movements (Aminzade, Goldstone, and Perry 2001; Goldstone 2001). The first tier is made up of those who occupy the top formal leadership positions. The second tier is the immediate leadership team of formal leaders. The third tier or 'bridge leaders' are neighborhood and community organizers. They mediate between the top and the grassroots and carry out movement goals on the ground.

The Zero Budget Natural Farming movement in Karnataka, India

Karnataka is a southwestern state in India with a population of 61,095,297.⁹ Nearly 56 percent of the workforce in Karnataka is engaged in agriculture and related activities (Das 2005). Agriculture in Karnataka is dependent on the monsoon, and drought has become frequent. The main crops grown in the state are rice, millet, maize, pulses, oilseeds, cashews, coconut, arecanut, cardamom, chilies, cotton, sugarcane, tobacco, coffee and silk (Government of Karnataka 2006).

ZBNF falls under a larger tradition of farming in India, called natural farming. There are teachers from other parts of India who promote similar principles but not at the same scale.¹⁰ Most have some combination of Gandhian principles, the Japanese natural farmer Fukuoka's teachings of 'do-nothing' farming, and traditional farming methods (Dabholkar 1998; Fukuoka 2001; Mansata 2015).

ZBNF first came to Karnataka when a senior farmer leader from KRRS came across Palekar in the neighboring state of Maharashtra in 2002.¹¹ He invited Palekar to Karnataka and organized a couple of workshops through KRRS. After an encouraging response from farmers, KRRS started to promote ZBNF through its organization, becoming the medium through which ZBNF first spread across the state, mirroring the experience of CaC in Central America and Cuba.¹² Karnataka has a history of new social movements since the 1980s including the KRRS and its allies – the environmental movement, and the Dalit

⁹Government of India 2011.

¹⁰Other renowned natural farming experts in India are Raju Titus, Shripad Dabholkar, the late Bhaskar Save and G. Nammalvar (Dabholkar 1998; Alvares 2009; Mansata 2015).

¹¹Interview with ZBNF leader.

¹²In Nicaragua, CaC first spread through the peasant organization Unión Nacional de Agricultores y Ganaderos de Nicaragua, while ANAP was the medium for CaC in Cuba.

movement (Assadi 2004). The presence of such social networks, KRRS leaders argue, made Karnataka a receptive arena for the initial success of ZBNF.

Like the rest of India, Karnataka has been reeling under an agrarian crisis characterized by indebtedness and rising farmer suicides. According to the National Sample Survey Organization (2005), 77.3 percent of all agricultural households in Karnataka are indebted, which is higher than the national average of 50.1. Debt is spread across agricultural households of all classes, from very small (less than one hectare) to large (more than 10 hectares), and even middle to large farmers have been reduced to penury, many seeking out wage labor (Patnaik 2004). Debt has been attributed both to reasons related to agriculture and to social obligations like marriages, education and health care (Deshpande 2002; Misra 2008).

According to the National Crime Records Bureau of India (2014), farmer suicides in Karnataka are mainly concentrated in the medium and small farmer categories, followed by very small farmers (see Table 2). Women farmers were 7.4 percent of the total suicides, out of which a majority were of the medium land-holding category (70 percent).

It is in this context that many farmers of all classes have looked towards alternatives to end debt and improve incomes.

Caste and class character of the ZBNF movement

Because ZBNF initially relied on the state farmers' movement's organization (KRRS) in Karnataka, we can in part look towards KRRS as a yardstick to understand ZBNF's social base. Of course, ZBNF today goes beyond KRRS to include newer groups such as urban-origin farmers,¹³ and a variety of ideological leanings.¹⁴

KRRS members are mainly land-owning peasantry. Like members of other farmers' movements in India, these farmers have land and surplus produce for the market, and are more commercial. They are therefore impacted by and dependent on the market for inputs and credit (Nadkarni 1987). Many of India's so-called 'farmers' movements'¹⁵ like KRRS arose after the Green Revolution, as a result of insertion into capitalist markets. Instead of focusing on differentiation within rural society (for example, caste/class differences), they attempted to unite the entire peasantry against exploitation by urban elites and foreign capital. They mobilized around fair prices, loan waivers, seed/food sovereignty and global trade, all of which impacted the majority of peasants, whether small, middle or large (Nadkarni 1987). Unlike other farmers' movements of India, KRRS went beyond market-related issues with a more profound ideological stance, calling for a total revolution of

¹³Our interviews indicated that a growing number of urban people are looking to start ZBNF. They found ZBNF to be accessible because of many training activities, and mentors among rural ZBNF farmers. Palekar also conducts special training camps for urban-origin farmers with no prior experience in farming.

¹⁴ZBNF's members have widely differing ideological stands, and many of them do not see eye to eye in political terms. While groups like KRRS stand on the socialist end of the spectrum, some from the Hindu Right are also promoting ZBNF. Palekar has a one-point agenda of promoting ZBNF, and does not seem to discriminate between groups that invite him to promote ZBNF, be they corporations, right-wing groups, or left-leaning socialists.

¹⁵These newer 'farmers' movements' are in contrast to the earlier 'poor peasant' movements, which had a more local character, and arose against feudalism in those states of India (e.g. Bihar) where feudal structures still dominate. Such poor peasant movements were traditionally supported by the various communist parties in India as well as the Maoist guerillas (Bhattacharya 2014).

Table 2. Percentage of farmer suicides in Karnataka by land holding size, as reported by the National Crime Records Bureau of India (2014).

Land holding size (ha)	Total farmer suicides (%)
Very small (0–1)	15
Small (1–2)	46
Medium (2–10)	36
Large (more than 10)	1

rural life based on Lohia's socialism¹⁶ and Gandhi's *swaraj*. This mobilized support from a large segment of the peasantry across classes. While subsistence peasants and rural labor are not part of KRRS, it has a sympathetic stance towards them, and has also supported struggles of landless peasants for land titles (Kadkol 2014).

Even if the leadership of KRRS has traditionally come from middle to large farmers, mainly because they have the resources to engage in volunteer activities, small farmers are strongly involved in the movement. This is not only because of KRRS's campaigns or ideology, but also because of caste solidarity (Nadkarni 1987; Bhattacharya 2014).

KRRS's social base comes from the two so-called dominant and fairly elite castes¹⁷ in Karnataka – Lingayats and Vokkaligas – the land-owning and -cultivating castes who form a third of the population of the state, and who own most of the cultivated land. These caste members come from all social classes, including landless and tenants. KRRS also has a few lower caste Dalits, including in leadership positions of some districts. Caste solidarity has played a role in bringing small and marginal farmers from the dominant castes into the movement (Nadkarni 1987), as well as in mobilizing resources for the movement.

KRRS leaders explain that, ideologically, KRRS is strictly opposed to the caste system and has carried out various programs to oppose caste differentiation in the countryside, including promoting inter-caste marriages. They are ideologically allied to the Dalit movement in Karnataka, and the leadership of both groups have formed a political party called Sarvodaya Karnataka (Staff Correspondent 2005).

According to our survey (see Table 3), 100 percent of those surveyed owned land, with 28.9 percent in the very small and small farmer category, 43.3 percent in the semi-medium and medium size category, and 27.8 percent in the large categories. The majority of the farmers came from the middle farmer category, followed by equal numbers of very small/small farmers and large farmers. The majority had access to some form of irrigation and owned at least one cow. In interviews with farmers it also became clear that none of the farmers were absentees; one of the key findings was that ZBNF needs constant personal attention and observation of the farm.

Reducing the cost of production and escaping the debt trap was one of the main reasons that interviewees entered ZBNF. One leader explained that almost all farmers who practice green revolution farming find themselves in a constant cycle of debt due to very high costs of production, which makes ZBNF an attractive option. He also pointed out that many

¹⁶Ram Manohar Lohia was a prominent Indian socialist. His so-called 'New Socialism' promoted among other things the abolition of caste, economic equality, freedom of thought, emancipation of women and national independence (Jain and Gupta 2012).

¹⁷A caste is considered dominant when it has relatively large numbers and wields economic and political power over other castes. While Lingayats and Vokkaligas are not high on the caste scale, they are dominant because of their numbers and economic power.

Table 3. Characteristics of ZBNF farmers interviewed ($n = 97$).

Land ownership	Owned, vs. other forms of tenure ^a	Percentage
	Very small (0–1 hectares)	9.3
	Small (1–2 hectares)	19.6
	Semi-medium (2–4 hectares)	13.4
	Medium (4–10 hectares)	29.9
	Large (more than 10 hectares)	27.8
Type of farming practiced prior to ZBNF	Chemical farming	57
Irrigation	Percentage with irrigation	66
Ownership of at least one cow		68

Note: Survey conducted in 2012.

^aCategorization based on the National Sample Survey Office, Government of India.

Table 4. Most common reasons given for adopting ZBNF as reported by farmers ($n = 97$).

Reason	Percentage
Family health	53.6
Food self-sufficiency	45.5
Reduce costs of production	38.1
Reduce debt	30
Environmental reasons	42
Reduce dependency on corporations	33
Spiritual reasons	30

Note: Survey conducted in 2012.

others who adopt ZBNF are interested in agroecological processes; they are creative, like to try new farming methods, or have some experience with other types of organic farming, which helps ZBNF capture their imagination.

According to our survey, people also adopt ZBNF for reasons such as family health, food self-sufficiency, environmental reasons, and reducing the cost of production, among others (see Table 4).

Women are present in the movement and also attend training camps in large numbers. Twenty-nine percent of interviewees responded that women participate in ZBNF at the home farm. In the ZBNF training camps it was evident that at least a quarter of the participants were women. As in many farmer’s movements like KRRS, women are at the front lines of the struggle; however, very few occupy leadership positions. In a traditionally patriarchal arena, KRRS women are making efforts at carving out a space inside the movement. They have organized women’s study camps to address equal access to land, reproductive rights and equal participation at leadership levels (LVC South Asia 2015a). Such new spaces, along with KRRS’s agroecology school Amrita Bhoomi, according to a woman leader, will be key for women’s leadership and training. Youths form a significant portion of the membership; at least 25 percent of the people interviewed ($n = 31$)¹⁸ were below 30 years of age. Most were from peasant families and had access to family

¹⁸In-depth interviews.

land, but had been working in non-farming jobs before returning to the land and joining the ZBNF movement.

ZBNF practices and agroecology

Although Palekar does not use the word ‘agroecology’ for ZBNF, we believe that ZBNF exemplifies agroecological principles. As LVC points out, a number of names exist around the world for farming practices based on similar principles. Instead of labels, we are concerned with the key ecological and political principles that underlie ZBNF, and we find those to be consonant with agroecology (La Via Campesina 2013).

As an applied science, agroecology uses ecological principles for the design and management of sustainable agroecosystems that work with natural processes like photosynthesis, nitrogen fixation and enhancement of biological activity, instead of external inputs (Altieri, Nicholls, and Funes 2012). Key principles of agroecology are (Altieri 1989):

- Enhanced biomass recycling;
- Strengthened ‘immune system’ of systems through enhanced functional biodiversity;
- Enhanced soil conditions by managing organic matter and soil biological activity;
- Minimized loss of energy, water, and nutrients;
- Diversification of genetic resources;
- Enhanced beneficial biological interactions.

Because agroecology is dependent on careful observation of ecological processes in a local context, it does not support a ‘recipe’ type of agriculture where purchased inputs can be handed out in a package. Every farmer has to adapt principles to their own cultural and ecological context (La Via Campesina 2013). Agroecology and organic farming are not the same thing. When organic farming promotes substitution of chemical inputs with other external inputs which maintain farmer dependency, it is not agroecological (Rosset and Altieri 1997).

The four pillars of ZBNF

ZBNF, like agroecology, aims to enhance nature’s own processes and eliminate external inputs, debt and dependency. The practices of ZBNF include effective spacing of crops, contouring and bunds to conserve water; intensive mulching; the addition of microbial cultures to enhance decomposition and nutrient recycling; use of local seeds; integration of crops, trees and livestock (mainly cows); extensive intercropping; and crop rotations, among others. Below we describe the so-called pillars of ZBNF.

Jivamrita

Meaning ‘life tonic’, jivamrita is a homemade fermented microbial culture made of water, cow dung and urine, jaggery,¹⁹ legume flour, and a handful of soil as an inoculant of local micro-organisms. Jivamrita acts as a catalytic agent that enlivens the soil, increasing microbial activity and organic matter. Jivamrita also helps to prevent fungal and bacterial growth. Palekar claims that jivamrita application significantly increases earthworm activity,

¹⁹Unrefined cane sugar.

which farmers confirmed in interviews as being true in their experience. Palekar argues that only the dung and urine of indigenous cows (*Bos indicus*) should be used for making jivamrita because it has a superior microculture compared to that of introduced European breeds (Palekar 2005). Furthermore, Palekar rejects the introduction of vermicompost, and the *Eisinea feotida* worm, exotic to India and popular in the vermicompost industry.²⁰

Bijamrita

Bijamrita is a homemade microbial seed treatment made of similar ingredients as jivamrita and used for the treatment of seeds, seedlings or any planting material. It is effective in protecting seedlings from seed or soil borne diseases, as well as young roots from fungus.

Acchadana (mulching)

ZBNF promotes many types of mulching. Soil mulching is the protection of topsoil by avoiding tilling. Straw mulching is the addition of straw to the soil to enhance decomposition and humus formation through the activity of the soil biota, activated by jivamrita. We noticed that most ZBNF farms have thick straw mulching, which when lifted reveals a totally different microclimate and insect community than those found in unmulched areas. Live mulching is like cover cropping: intercropping of monocotyledons and dicotyledons, grown in the same field, to supply all essential elements to the soil and crops (Palekar 2006).

Whapasa (moisture)

Palekar challenges the idea that plant roots need a lot of water, thus countering the overreliance on irrigation in green revolution farming. According to him, what roots need is water vapor. *Whapasa* is the condition in which there are both air molecules and water molecules present in the soil. He encourages reducing irrigation, and irrigating only at noon, in alternate furrows.

There are also a number of pest management measures such as *neemastra*, *agniastra* and *brahmastra* – which are homemade preparations used for insect pest control, in addition to functioning as fungicides and as ‘tonics’ (Palekar 2005). ZBNF practices and principles cannot be applied on a recipe basis in any location. Farmers stated in interviews that ZBNF needed to be adapted to each farm’s local conditions. The innovation and creativity of farmers was paramount in this process. As one ZBNF leader said, ‘Natural farming is at the end of the day an attempt to converse with nature. In natural farming every farmer turns into a researcher in his fields’.

Some may argue²¹ that Palekar is too rigid with his methods, and that this goes against the spirit of farmer experimentation. However, of the ZBNF farmers we have visited, almost all engage in their own experiments and adaptations of ZBNF practices. We have come across farmers who combine different teachings from different organic or natural

²⁰Palekar’s criticism is based on the fact that the *Eisinea feotida* is an exotic species, and there are no quality-control measures in India to test vermicompost sold to farmers at high costs, which has been found to contain toxic heavy metals. Instead he promotes increasing populations of native earthworms *in situ* (Palekar 2005, 177).

²¹An anonymous reviewer of this paper raised the point that Palekar does not directly invite experimentation, or the altering of his prescriptions. Nevertheless, farmers routinely do both.

methods too. Some continue to use chemicals but add jivamrita or other ZBNF practices to the mix. Farmers tend to choose what is most effective for them:

I have also learned about Mr Raju Titus's style of natural farming. He follows Fukuoka's do-nothing, no-till farming style. But I don't engage in unnecessary criticism of the different teachers or methods. I learn the best aspects from all of them and choose what works best for me.

Keys to the success of ZBNF

Efficacy of methods

In our questionnaire (see [Table 5](#)) the respondents reported that by adopting ZBNF, over time 78.7 percent saw improvements in yield, 93.6 percent in soil conservation, 76.9 percent in seed diversity, 91.1 percent in quality of produce, 92.7 percent in seed autonomy, 87.8 percent in household food autonomy and 85.7 percent in income, while 90.9 percent experienced reduced farm expenses and 92.5 percent saw a reduced need for credit.

Farmers pointed out in interviews that a cash-flow problem was standard during monoculture chemical farming because income was only earned when the monoculture was harvested, while expenses for saplings, seeds, chemicals, fertilizers, labor, etc. were incurred throughout the year. This resulted in a constant need for loans to cover expenses. In contrast, ZBNF has enabled farmers to grow multiple crops with very low costs and earn cash throughout the year (Babu 2008). Even if they experienced lower yields per crop, their net incomes were higher and more constant (see Rosset 1999 for discussion on monoculture versus multicropping productivity). This helped them to phase out loans. As one ZBNF farmer said:

In ZBNF our expenses are very low. It doesn't matter what the yield is, I still make a profit because my costs are negligible. Plus I've added intercrops to this so I get income from many crops, not just one. Yield is not an important concept for us.

Another farmer referred to how ZBNF helped to end his cycle of debt:

I had 5–6 loans during the chemical farming days – a loan for my daughter's marriage,²² others for saplings, stems and fertilizers. Now my farm expenses are so low, and everything I get is an income for the family. I don't even need labor, my family works. I owe nothing to anyone.

As ZBNF helps to reduce labor costs over time, a concern expressed by some²³ regards the consequences for rural labor. ZBNF farmers report that in comparison to chemical farming ZBNF did not require frequent spraying of chemicals, or weeding – weeds are considered friends by ZBNF farmers. Farmers reported that hiring of labor was dependent on the size of the land holding. Small farmers are able to manage ZBNF operations using their own family labor if they wish to reduce costs, while larger farmers continue to employ labor for farm operations.

In recent years, availability of farm labor has declined, especially in drought-prone states like Karnataka. Studies point to a complex set of factors behind this trend, such as

²²Farmers depend on earnings from agriculture to meet not just agriculture-related expenses but also other social expenses.

²³Including an anonymous reviewer of this paper.

Table 5. Efficacy of ZBNF in some social, economic, agroecological indicators (%) as reported by farmers ($n = 97$). Highest values are in bold.

Number of farmers (%)	Yield	Soil conservation	Seed diversity	Pest attacks	Quality of produce	Seed autonomy	Household food autonomy	Selling price	Income	Production costs	Need for credit	Health
Has decreased	12.8	2.1	12.8	84.1	4.4	2.4	4.9	7.9	4.8	90.9	92.5	0
No change	8.5	4.3	10.3	4.5	4.4	4.9	7.3	34.2	9.5	2.3	3.8	0
Has increased	78.7	93.6	76.9	11.4	91.1	92.7	87.8	57.9	85.7	6.8	3.8	100.0

Note: Survey conducted in 2012.

Table 6. Main pedagogical experiences through which farmers ($n = 97$) reported learning about ZBNF.

Type of pedagogical experience	Farmers (%)
State-level ZBNF training camps led by Palekar	60.8
Advice from other farmers	49.5
Books authored by Palekar	43.3
Visiting other ZBNF farms	41.2

Note: Survey conducted in 2012.

higher growth and better wages in non-farm employment, laborers' lack of preference for agricultural work, and the national Mahatma Gandhi National Rural Employment Guarantee Scheme, a state-run employment-guarantee scheme for rural labor which has also increased farm wages (Murthy and Indumati 2011; Chand and Srivastava 2014; Gulati, Jain, and Satija 2014). This positive trend in wages is not accompanied by a rise in farm incomes, making it difficult for already indebted farmers to meet rising costs.

According to our questionnaire (see Table 5) and interviews with farmers, soil quality and organic matter improved after adopting ZBNF. Farmers reported increased earthworm and beneficial soil insect activity. Many also mentioned that moisture content in soil increased because of mulching and bunds, bringing down the need for irrigation considerably. ZBNF aims to reduce irrigation needs by 90 percent (Palekar 2006, 385), making it ideally suited for dry-land farming and drought conditions. Said one farmer: 'The problem of water scarcity during summer doesn't affect me anymore because in natural farming one requires very little water'.

Pedagogical processes

Our review of the literature points to the importance of horizontal pedagogical processes in successful scaling-up cases. ZBNF employs a combination of both conventional, more vertical pedagogy and horizontal pedagogical processes that take place in both an organized and a spontaneous manner. The main pedagogical experiences through which farmers responding to our survey learned about ZBNF are listed in Table 6.

These figures suggest that state-level ZBNF camps taught by Palekar are the most popular method for farmers to learn about ZBNF. Farmers indicated that attending a camp was almost always followed by exchanges with other farmers to learn about the practicalities of the method. In some districts there was a local ZBNF group, which served as an important platform for organized exchanges and networking, while in others, farmers found mentors on their own. Below, we describe the two most important pedagogical activities of the movement.

State-level ZBNF workshops

The main centrally organized pedagogical activity is the ZBNF training camp taught by Palekar. We visited a camp in 2012 in the town of Tumkur in south Karnataka, to observe first hand the methodology and dynamics at the camps. The training camp lasted five days, with about eight hours of classes per day. Some 2500 people attended. Farmer leaders informed us that camp attendance has ranged between 1000 and 5000 people. Some farmers were second-time or even third-time attendees. Arrangements were made

for housing and all meals. The attendance fee for the full five days was 250 rupees (USD 4). Those who could not afford to pay were allowed to come for free and others were asked to pay for them. Volunteers carried out all logistical work, like cooking and cleaning. Farmers donated food. The workshop took place in a *matha*,²⁴ which serve as venues for many other camps and are offered free of cost.

The workshop covers a wide range of issues, from philosophy to ecology, to ZBNF practices, to successful farmers' experiences. Palekar goes into great detail on every topic and the farmer attendees take notes feverishly. One youth said: 'Palekar's camp is as good as getting a BSc in agriculture. It's better than university. I know because I studied agriculture at university'.

A normal practice is that everyone on stage, including Palekar, successful farmers, and other leaders, announces their phone numbers so they can be contacted at any time. Field trips are usually organized to nearby ZBNF fields in smaller groups. Financial accounts are announced on the microphone to maintain transparency.

For many farmers this is the first time that they have engaged in an agroecological interpretation of the processes in their fields. One farmer said:

No scientist, no extensionist can explain to us the way Palekar has. He gave me direction in life. I have already studied all his books, and now I understand how my farm works – what plants need, what humus is, what the soil is made of, what the nitrogen cycle is and why we need to protect all these.

The class sessions are taught in traditional classroom style. Palekar has a vertical relationship with the farmers, where he addresses a large crowd from a stage, usually accompanied by a Kannada²⁵ interpreter, as Palekar speaks in Hindi or English. The sheer size of the classroom prohibits any space for dialogue during the class sessions. However, farmers seemed to enjoy Palekar's lessons; there were constant sounds of wonder, laughter and united agreement. Palekar himself is a charismatic teacher who jokes frequently and uses effective framing and discourse to reach out to farmers. One KRRS woman leader said,

I already knew about ZBNF but I wasn't so interested. But when I heard Palekar, I was able to understand very well, because he talks like us farmers, in our language. He gives so many clear examples, I really understood well. I was so inspired that I didn't sleep the first night. My head was full of questions all night.

Because of the length of such training camps, it is not always possible for the poorest farmers, who have to take care of all farm operations themselves, to leave their farms for extended periods of time to attend. This, said one ZBNF leader, was a drawback in being able to reach out to the most marginal farmers.

Farmer-to-farmer exchanges

The camp itself represents an important opportunity for farmers to meet and exchange contact information with hundreds of other farmers. Farmers engage in many debates and discussions, and some of these debates last all night. While the official class space is

²⁴Mathas are Hindu monastic institutions led by a guru; they are separate entities from temples (Ikegame 2012).

²⁵Kannada is the main language spoken in Karnataka.

a vertical pedagogical experience, the most important horizontal exchanges among farmers take place outside of the class.

In interviews, farmers informed us that direct exchanges between farmers are an important step for them to learn about ZBNF. New farmers are encouraged by Palekar and other leaders to find a mentor farmer to help them through the entire learning process. A common practice in the ZBNF movement is the exchange of contact information, via announcements on stage, radio, newspapers, Whatsapp or Facebook.

For example, one farmer found a ZBNF mentor via a radio show:

I heard about this excellent ZBNF farmer on the radio and felt very inspired by his story. The very next day I caught a bus to his village to meet him and asked him to teach me. He noticed my enthusiasm and decided to let me stay for a few weeks, to work on his fields and learn about ZBNF.

A sense of solidarity exists in the movement; successful farmers provide support to as many as they can. Many voluntarily travel extensively to visit the fields of new farmers and provide guidance. One successful ZBNF farmer from KRRS said:

I have to switch off my phone for some hours a day; otherwise it rings constantly because farmers call all the time. I visit many farmers in my free time, and I also give many people advice on the phone.

While many of these activities take place spontaneously, some districts have locally organized ZBNF groups. Each district organizes autonomously and there is no central control over them. We visited some districts to observe how these processes work. In Bijapur district a group of ZBNF farmers met at a local leader's house once a month to exchange experiences and discuss problems, and even went on collective study tours such as to a ZBNF training camp. They also invited Palekar to teach at a ZBNF camp organized by them in their district.

In Belgaum district, a group of enthusiastic farmers created a local study group, which has a manifesto, and a motto: 'I am for all and all are for me'. They meet once a month on someone's farm to discuss a particular topic. At the end of their meeting, they collectively observe the host farmer's field to come up with solutions to problems the farmer faces. They also invite speakers; for example, a seed-saving expert farmer from the neighboring district was asked to carry out a workshop on seed saving.

In Mysore district, a group of committed urban individuals and farmers have set up an organization that is creating a database of all the ZBNF farmers in the district, has produced various pedagogical materials for both literate and illiterate farmers, and organizes various exchanges and training activities.

In Bidar district the local KRRS leadership carried out ZBNF promotion work, including monthly activities like puppet shows to teach people about ZBNF. In Kollegal, a local KRRS leader and seed saver had created a seed savers' group and served as mentor to a 20-member youth group, all of whom were doing ZBNF on their farms. These are a few of many such examples we encountered across the state.

ZBNF leaders, who usually evolve spontaneously, told us that they maintain records of successful farmers in their respective areas, and serve as reference points for farmers who often call them when they need advice. These leaders then connect those farmers who have problems with expert farmers who have already resolved such a problem in their own fields. Unlike the Cuban CaC process where facilitators and promoters work in an organized

manner to perform similar functions, in ZBNF a similar process takes place in a more informal and spontaneous fashion.

ZBNF has a wide array of educational material that serves as important pedagogical tools for peasants. In addition to the members' farms that serve as classrooms for farmer-to-farmer learning, there is also a large collection of books. Palekar has authored and published about 66 books in various languages.²⁶ Books on ZBNF by other authors are also popular among farmers.²⁷ There are also DVDs of Palekar's training camps for use by local ZBNF groups.

Leadership and structure

Our literature review highlights the role of leaders in movements. Our interviews with farmers, allies and leaders indicated that leadership has been a major factor in the success of ZBNF. ZBNF has three main levels of leaders (Aminzade, Goldstone, and Perry 2001; Goldstone 2001). Palekar represents the first tier of leadership. He plays an inspirational role and his charismatic personality draws people to the movement. The second tier is an informal team of volunteers who are close to Palekar. The third tier, or bridge leaders, are the ones that carry out the grassroots organizing and function at the local level. None of these positions is paid.

There is no formal central-level organization to carry out movement tasks, but an informal network of second-level leaders does exist. *Ad hoc* teams made up of volunteers, allies and second-tier leaders carry out the task of organizing ZBNF training camps. There was a movement organization called the Zero Budget Natural Farming Platform that lasted three years from 2006 to 2008, but it was dissolved by Palekar due to internal conflicts. KRRS leaders informed us that Palekar has evaded functioning within a democratic organizational structure because of his tendency toward overpowering authority. Palekar, however, criticizes formal organizations like KRRS for suffering from power struggles between leaders, somewhat echoing Piven and Cloward's (1977) critiques of central organizations that may divert members from real movement goals.

As a leader, Palekar carries out various functions – his charisma draws people to the movement; he is the main teacher; he produces cultural resources like frames and books, mobilizes resources from allies, and plays an inspirational role for movement members. However, he does not engage with local-level organizing, which takes place via autonomous, self-organized groups. Weber's theory of charismatic leadership posits that leaders' personal magnetism plays a key role in drawing people to the movement (Weber 1968). Followers assign near-divine powers to the leader and form an emotional connection with him or her. Some of Palekar's followers attribute extraordinary or godlike qualities to him, as illustrated by comments from farmers:

Palekar is more than a guru to me.

Most farmers worship Palekar, they treat him like god. I too am his worshipper – but not a blind worshipper. I appreciate his work and dedication.

²⁶There are 10 books in English; nine in Kannada; 15 in Hindi; 22 in Marathi; and 10 in Tamil, Malayalam and Telugu, respectively. They can be ordered via mail and are sold at training camps.

²⁷One ZBNF volunteer who worked for the state adult literacy department used his post to publish a series of more than 10 books, each written by the farmers themselves about their own ZBNF experiences, as part of their adult literacy classes. These books were used as textbooks for other farmers in the literacy program.

Weber also highlights the impact of charismatic leaders on movement structures; they are usually not democratic, as the leader's authority is supreme, and second-tier leadership is based on closeness to the charismatic authority. But as Melucci (1996) points out, the theory ignores the agency of followers. In the case of ZBNF, followers have self-organized into a richness of different forms across Karnataka, and carry out movement activities without depending on the charismatic leader. ZBNF groups abound, not just on the ground, but also online. Their main aim is to carry out exchanges and pedagogical activities. Anyone wishing to start ZBNF activities is invited to do so. Our interviews highlight that the presence of bridge leaders is one of the key variables that explain the presence of local organization.

Bridge leaders carry out many roles. For example, in one district a leader frequently recruited new farmers for the ZBNF group, conducted a monthly meeting at his house and also raised resources from his contacts to pay for training activities. His position as a farmer scientist in the local public agriculture university gave him the opportunity to lobby for ZBNF using university resources. Another group of leaders in one district set up a local ZBNF chapter and engaged in monthly farmer-to-farmer meetings. They established an experimental plot on one of the farmers' fields and were in the process of setting up marketing opportunities by mobilizing support from their allies in local government. One successful farmer organized a competition in his village to give a prize to the best ZBNF sugarcane crop, and put up the prize money himself. In another district a youth group headed by a young successful farmer has decided to turn their entire village to ZBNF and dedicate themselves to training activities. An older farmer said: 'I don't approach extension officers even though they are always eager to give us advice ... I just directly call this young farmer if I have problems. He is excellent!'

Another farmer member from this youth group is an extension officer for the public agricultural university: 'I always tell farmers to do ZBNF, even though my job expects me to promote green revolution technologies'. Many such examples of local leadership exist in every district of Karnataka.

Second-level leaders can be seen as the facilitators of the movement at the state level. They are closer to Palekar and may not be involved in core local-level organization, unlike bridge leaders. They are important reference points for the farmers. They maintain contacts of farmers and link farmers who have problems to successful farmers. They also carry out important movement tasks like fundraising, organization of training camps and interpretation work, and even provide telephone support to farmers in their initial days of ZBNF. According to one leader, there are no hard and fast titles; it is an informally structured movement, and anyone wishing to take on a role is welcomed. The movement thus runs on the initiative of volunteers across the state.

Mobilization of resources from allies

Our literature review highlights the role played by allies and outside groups in bringing a range of resources to the movement (Oberschall 1973; Gamson 1975; McCarthy and Zald 1977; Tilly 1978). Our interviews with both ZBNF and KRRS leaders indicated that the mobilization of resources from different groups like the KRRS, some *mathas* and various individuals, as well as some NGOs, is one of the key ways that the movement functions. Organizing the ZBNF training camp, which is an enormous logistical task, is accomplished mainly using resources supplied by allies. ZBNF also has a highly evolved communications process supported by allies. While the role of allies is emphasized here, the movement also mobilizes a range of resources internally. Some examples are human

resources like volunteers and leaders, or cultural resources like frames and books, as well as socio-organizational resources like local self-organized groups. It is important to note that ZBNF does not have a bank account or a formalized method to mobilize these resources; it does not apply for funds or projects. Instead, resources are mobilized spontaneously when the need arises, for example for training camps.

KRRS is a key ally of ZBNF. It is through KRRS's organization that ZBNF first gained ground in Karnataka. Various position papers and protest banners of KRRS indicate that it promotes ZBNF as a form of struggle against farmer suicides and the climate crisis (La Via Campesina South Asia 2015). ZBNF is part of not just KRRS's discourse but also its practice. KRRS actively brings in various resources for ZBNF. It has secured support from the Karnataka government for its peasant agroecology school, Amrita Bhoomi, where ZBNF is being taught and a network of trainers being created. Amrita Bhoomi also carries out trainings on agroecology for Dalit and Adivasi groups, many of whom live in the neighboring villages (Amrita Bhoomi 2016a). Dalit youth groups routinely use Amrita Bhoomi facilities for their own training purposes. Caste issues are a key part of the curriculum for youth training on agroecology – this is one way for KRRS to reach out to groups and perspectives outside its middle-peasantry and dominant caste membership (Amrita Bhoomi 2016b). KRRS provides many resources for ZBNF training camps – volunteers, promotion at the village level, and legitimacy. They carry out pedagogical processes at local and national levels, and at the international level through LVC. Some of these exchanges have resulted in the adoption of ZBNF in other countries such as Nepal and Sri Lanka (La Via Campesina South Asia 2011; LVC South Asia 2015b). In Sri Lanka, LVC members Movement for National Land and Agricultural Reform have spread ZBNF to at least 6000 farmers in 14 of 25 districts in Sri Lanka.²⁸

Mathas have played a crucial role in terms of logistical support including accommodation, food, training space and volunteers. Mostly found in a few states like Karnataka, *mathas* are politically powerful religious institutions and an integral part of the social fabric in Karnataka. They are organized around kinship and caste, and since the 1990s even lower castes have their own *mathas* (at least a hundred) in Karnataka (Ikegame 2010). The powerful Lingayat caste *mathas*, in particular, have a long history of carrying out social programs, and today have an almost 'state within a state' kind of status – providing free schools, hospitals, dormitories and meals, and even a parallel court system. As KRRS members, as well as most land-owning peasants, belong to predominantly Lingayat and Vokkaliga groups, they have been able to mobilize resources from *mathas* of these castes to promote ZBNF. The *mathas* promote these ZBNF trainings as part of their normal social outreach programs.

Some observers (i.e. Münster 2016) have noted that *mathas* have played a role in hindutva²⁹ politics in the Karnataka state, and see a risk of them using Palekar and ZBNF to promote a fundamentalist right-wing agenda.³⁰ While it is partly true that a few especially

²⁸Personal communication.

²⁹Hindutva is a fundamentalist and elite form of Hinduism promoted by certain fundamentalist groups. They are intolerant of other religious minorities – e.g. Muslims and Christians. Violent atrocities like pogroms have been committed around the country in the name of Hindutva. Their political arm, the Bhartiya Janta Party (BJP), is now in power in New Delhi (Robinson and Upadhyay 2012).

³⁰Münster, in his work on ZBNF in Kerala (Münster 2016), has expressed concern over Palekar receiving an award during the World Conference on the Indian Cattle Breed, held at a Brahmin matha in Shimoga Karnataka, which was attended by Hindutva activists and organisations. The cow has become a central issue for Hindutva groups today.

upper caste Brahmin mathas of coastal Karnataka have supported the Hindutva ideology, it has not been endorsed by most of the powerful Lingayat *mathas* (Viswanathan, Krishnakumar, and Menon 2004). Many of these have vocally opposed Hindutva discourse as an intolerant worldview (Buradikatti 2015).³¹ The politics of *mathas* in Karnataka is a complex issue,³² *mathas* are not a homogenous entity, and rivalry and differences between them exist. While this may not fully absolve *mathas* of such criticisms, we would like to argue here that the Lingayat and Vokkaliga *mathas* have provided support to ZBNF not because of a right-wing agenda, but rather due to the historical role they have played in assuring the welfare of their community members, the majority of whom are from farming families and are victims of an agrarian crisis.

Many influential individuals, local groups and NGOs have provided a variety of resources to ZBNF. Some bring in funds – for example local cooperative banks, builders, sugar mills, businessmen or supportive political parties.³³ A few film actors of South India have started practicing ZBNF on their farms and frequently promote it on social and mainstream media (Sanandakumar and Krishnakumar 2014; Hooli 2015). Some writers have written books on ZBNF, one of which had sold more than 75,000 copies by 2012 in Karnataka (The Hindu 2012). Various NGOs promote ZBNF methods through their programs, or support individual farmers.

In the past, only a few government officials or state scientists supported ZBNF. KRRS leaders argue that Palekar's hostility towards state scientists has led to their dismissal of Palekar. More recently, however, some government agencies have started to recognize ZBNF. In January 2016, the Andhra Pradesh government organized an eight-day ZBNF camp with 6000 participants, including many from the state agricultural department, including the Chief Minister, announcing state support for ZBNF and requesting Palekar to 'adopt' the state to spread ZBNF there (Gulte.com 2016; Press Trust of India 2016a). Three thousand farmers will pilot ZBNF via state support in Andhra Pradesh (Sarma 2016). In 2016, Palekar became the first farmer to receive one of India's highest civilian awards, the Padma Shri, from the national government, in recognition for the ZBNF movement's achievements (Press Trust of India 2016b).

Various shops market ZBNF produce in metropolitan cities like Bangalore and Mysore, where at least eight shops exclusively retail ZBNF produce, as well as rural districts such as Mandya. While they are on the rise, these represent a small effort compared to the numbers of ZBNF producers, and marketing remains a challenge. Based on interviews, most farmers sell their produce mixed in with conventional products, with no price premium, as differentiated-marketing opportunities remain few. Some sell directly to consumers, and have managed to develop a loyal customer base through word of mouth.

In our opinion, one of the key cultural resources for the movement has been communications (see Table 1). ZBNF exhibits an unconventional mix of communication tools for a peasant movement. Allies, especially urban farmers and volunteers, support these efforts. There are many websites, blogs, YouTube videos and forums with online discussions dedicated to ZBNF (for examples see Nandakumar 2012 or FarmNest.com 2016). The radio is

³¹Viswanathan, Krishnakumar, and Menon (2004) highlight that the Tumkur, Siddaganga, Mysore Suttur, Chitradurga Sirigere, Sanehalli, Nidumamidi, Belimath, Gadag and Muragha have not endorsed the politics of Hindutva.

³²Support from Lingayat *mathas* was partially responsible for bringing the right-wing Bhartiya Janta Party to power in the state from 2008 to 2013. Analysts have noted that it was political pragmatism and not Hindutva ideology that led to this support (Vasavi 2008; Shivasundar 2012).

³³The Sarvodaya Karnataka Party has organized camps in the past.

an important media in rural India, and some local radio presenters who are supporters of ZBNF frequently bring ZBNF farmers to share their experiences on their shows. TV and newspaper journalists also frequently cover ZBNF. One farmer leader's anonymous column in a magazine was responsible for popularizing ZBNF in the neighboring state of Tamil Nadu. The ZBNF community also widely uses social media like Facebook to create direct connections among people who ask and answer questions, share information about farming practices and sell produce.³⁴ There are also countless Whatsapp groups for farmers to organize at the local level, as well as an Android app developed by a team of volunteer information technology professionals.

ZBNF as 'framing'

Our literature review highlights the importance of frames for movements to convey their ideology. ZBNF ideology aims to respect nature, and promotes values similar to Gandhian ideals: non-violence, autonomy at the personal and community level, a focus on personal change and moral responsibility, and no enemies (Palekar 2005). ZBNF engages in core movement framing tasks like diagnostic, prognostic and motivational framing carried out by social movements (Benford and Snow 2000). Palekar himself is the principal producer of these frames.³⁵

Based on an analysis of Palekar's speeches and books, the problem of the agrarian crisis is caused by what Palekar calls the 'exploiter system' (diagnostic framing) (Palekar 2005, 79), which is the global economic system characterized by exploitative relations between humans and nature and among humans themselves. He specifically points to the dominance of transnational corporations, 'Western technology, philosophy, economy and lifestyle'³⁶ that erode the autonomy of local communities. The green revolution is a manifestation of the 'exploiter system', which he says is the cause behind the devastation of nature as well as farmers' impoverishment and suicides. He challenges the introduction of exotic farming techniques and life forms in farming. For instance, the exotic Jersey cows are called 'cow pigs'; the California red earthworm is called the 'destroyer worm'.

Palekar's zealous promotion of the native cow and 'Indian culture' on the one hand, and demonization of exotic species and all things 'Western' on the other, is somewhat similar to Hindutva's discourse, its ideas of (elite Hindu) cultural superiority, and its so-called cow-protection campaign. Cow protection is a major issue for Hindutva groups (Robinson and Upadhyay 2012). Based on their questionable claim that ancient Indians did not eat beef, they have banned beef slaughter and consumption in various parts of the country, and promoted fear, persecution and even the killing of non-Hindu minorities (Moore 2016). Palekar's anti-West traditionalist discourse is also echoed by many of India's neo-Gandhian environmentalists and eco-feminist activists (Nanda 2003; Mawdsley 2006). In light of growing Hindu chauvinism in India, there is a need for a larger debate on the political implications of such discourse.

We would like to highlight that Palekar has not presented his views via hateful rhetoric towards other religions or peoples of India. In our own experience at ZBNF training camps,

³⁴There are many Facebook pages, with one official page, which has more than 19,000 members (<https://www.facebook.com/groups/zbnfsubhashpalekar/>). It is the site for many exchanges, especially for farmers who have cell phones, a commonly available service in rural India. Palekar himself responds to some questions posted on the page.

³⁵The framing literature points to the role of movement elites and leaders as 'cultural producers'.

³⁶Tumkur Camp, 2012.

he justifies his claims for the superior performance of local cows on the farm with the results of scientific tests that he claims to have conducted, including references to journal articles. While we are not aware that any of these specific claims have been corroborated or reviewed, at least some of them deserve further scientific inquiry. This is especially true as the loss of indigenous livestock diversity, displaced by a handful of commercially important imported breeds, is a real issue in India.

Palekar has unleashed a scathing criticism of the commercial organic food sector in India, and he calls industrial organics a ‘conspiracy of the exploiter system’ (Palekar n.d.). In his critique he highlights that many corporations, NGOs and the government have jumped onto the organic bandwagon to promote commodified organic inputs, which are exotic and expensive, and continue to exploit farmers – what Rosset and Altieri (1997) have called ‘input substitution’. However, Palekar also tends to label any kind of ‘organic’ as bad (not always specifying industrial or commercial organic) and has made blanket criticisms of anyone promoting other forms of agroecological methods that are not ZBNF, including LVC.³⁷ This absolutist attitude has burnt bridges with many other organic activists across the country. But this attitude is not typically reflected by the other practitioners of ZBNF, and certainly not by KRRS, who have been engaging in a dialogue with other movements both nationally and internationally via LVC (Martínez-Torres and Rosset 2014).

ZBNF is promoted as a solution to various dimensions of the agrarian crisis (prognostic framing). According to Palekar, the key aim of ZBNF is to create autonomy, and thus an exit from the ‘exploiter system’. But this also requires personal changes and responsibility. ZBNF is also called Zero Budget Spiritual Farming. In this view, adopting ZBNF is not just about adopting the techniques, but also about engaging in a spiritual lifestyle, which according to ZBNF is living a life closer to nature. As Palekar says, ‘Natural farming is the continuous process of changing yourself inside and outside simultaneously towards ‘adwaita’ – whole unity with God (nature) Spiritual farming means, we see god through god’s organs – trees, plants, mountains, forests, rivers, birds’ (Palekar 2005, 32).

Values of respect for nature are conveyed by the representation of nature as mother. Nature is called *bhumata* (mother earth), cows are *gomata* (mother cow) and ‘mother soil’ is called *Annapurna* – the all-giving, local earthworms – ‘mother of the soil’ (Palekar 2005). Palekar has also developed the ‘Annapurna theory’ that reinforces the idea that the all-giving Mother Earth does not need external inputs. Mulching in ZBNF is called ‘acchadana’ – the mother’s sari (Palekar 2005, 271) – and mulching is then seen as protecting the Mother Earth’s sanctity.

Another important element is the Gandhian ideal of *swadeshi* (acting within and from one’s own community). Like Gandhi, Palekar calls for the revival of the village economy, one that will be self-contained, supply all local needs through local resources and labor, and keep resources and gains in the village rather than with external corporations.

The strategy of shifting to ZBNF, according to Palekar, rests most importantly on moral imperative and personal change. KRRS leaders expressed that Palekar has openly criticized their movement tactics of direct action, which include protests, slogan shouting and occupations. There is clearly tension between Palekar and KRRS, which is still one of ZBNF’s most important allies. ZBNF does not engage in openly confrontational tactics even if Palekar may have a somewhat acerbic rhetorical style (for example towards organic farming or government scientists); ‘we are not anyone’s enemies, we are friends, everyone

³⁷Personal observations.

is welcome'.³⁸ This is in line with Palekar's lack of discrimination directed toward any type of group (left or right) that may want to promote ZBNF. Instead, Palekar says, it is important to take personal responsibility and practice ZBNF on one's own farm, accompanied by other personal changes towards a life of simplicity, away from consumerism and greed, and towards nature and autonomy. This, according to Palekar, will automatically lead to the erosion of the exploiter system's power.

In interviews, farmers highlighted that Palekar's discourse resonates with them, Palekar has high credibility among them, and they find his claims relevant to their lives – elements that determine cultural resonance of frames (Benford and Snow 2000). Palekar's speeches are replete with stories, cultural metaphors, characters and references to popular mythology, politics and history. He is a captivating orator and uses humor and satire to convey his ideas. Many feel motivated to change to ZBNF after listening to his speeches:

When I first went to the camp I wanted to leave, there were so many chores to finish back home. But when Palekar started talking about the Indian agriculture policy and how we are losing money to corporations, and suicides, debt, and health problems, I said, 'That's my story!' I became very attentive and stayed for the whole five days. When I went back home, I gave away all the bags of fertilizers I had purchased and started ZBNF.

Although my husband had already told me about ZBNF, I didn't take it seriously. But when I went to the ZBNF camp and heard Palekar himself, I found the speech amazing. I believed him.

Conclusion

We have tried to highlight some key factors behind how peasant movements take agroecology to scale. A principal lesson for scaling up is that the technical aspects of agroecology like farming practices are not enough. Other, social factors such as networks/organizations/movements, public policies, markets, pedagogical processes, leadership and discourse play a key role.

On the one hand we have highlighted successful strategies of ZBNF; on the other hand, we have also touched upon various challenges facing the movement. Some of these are the dominant caste/middle class characterization of the majority of its farmer members, and its inability to reach the most marginal sections of the peasantry. There is sometimes an uncomfortable closeness of some elements of Palekar's discourse to that of Hindutva's cultural chauvinism. Palekar has burnt bridges with many other organic activists nationally due to a blanket criticism of organic farming, while his confrontational attitude towards state scientists has reduced their sympathy towards ZBNF. There is an overall lack of focus on women's leadership, and women are in the movement mainly as the wives of practitioners. Even if farmer-to-farmer is a key means of spreading ZBNF on the ground, there is a high dependence on/preference for Palekar's training camps, but he is increasingly busy outside Karnataka as ZBNF spreads to other states. There is a need to develop new trainers at the state level. ZBNF leaders are aware of such drawbacks, and KRRS in particular represents one group that, because of its organizational capacity, is trying to address some of these issues. All these challenges notwithstanding, ZBNF has succeeded in capturing the hearts of farmers in rural Karnataka, and given them the means to shift their production models towards agroecology. It has also drawn in farmers of urban origin, leading to new urban–rural links.

³⁸Palekar's speech at a ZBNF training camp in Tumkur, Karnataka, in 2012.

For a movement like LVC that strives to consolidate a diversity of peasant movements (including agroecological movements in this case), there are difficult challenges. Indian social movements, in particular, form a complex terrain with their sheer diversity of ideological leanings and historical antagonisms between them – based on caste or class – despite seemingly working on similar issues. Yet building alliances and creating a joint banner of struggle remain key priorities for both LVC and KRRS. There is a constant process of ‘*dialogo de saberes*’ (which roughly translates to dialogue between different knowledges) in LVC (detailed in Martínez-Torres and Rosset 2014), as there is not one single way that can be imposed upon others. Such processes of dialogue take place from the local to the international level, and differences, debates and conflicts are a normal part of this process. ZBNF in Karnataka represents once such important point of convergence and alliance-building to scale up agroecology. At the same time it is part of the global dialogue inside LVC. There have been differences of opinion between ZBNF members and others at LVC’s agroecology encounters, and between KRRS and Palekar, yet this has not prevented collaboration (Martínez-Torres and Rosset 2014).

Today, ZBNF’s increasing popularity has started to draw attention from various friendly forces inside the state. The state government of neighboring Andhra Pradesh has pledged support, and so has Kerela, where there is a new organic farming state policy and a growing organic farming movement. These policy efforts are small in comparison to the support for green revolution-style farming, but they are important milestones for the movement nonetheless.

Palekar himself has put forth the view that self-reliance is the best way forward, as ‘governments have limitations due to globalization’ (Palekar 2005, 8). ZBNF is ultimately a bottom-up process that demonstrates the tenacity of grassroots movements, but supportive policies in research, marketing and education would go far in encouraging farmers and consumers to take a leap towards ZBNF.

Acknowledgements

The authors are grateful to the members and leaders of the ZBNF movement, KRRS and La Via Campesina for giving us the privilege of carrying out this research and for enthusiastically sharing their views. We also thank the members of LVC’s research team who helped with initial research – Stephanie Wang, Lionel Weerakoon, Basawreddy, Afsar Jafri and Alphaeus Moses. We thank the anonymous reviewers for the *Journal of Peasant Studies* for their valuable suggestions.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Alavi, H. 1965. Peasants and revolution. In *Socialist register*, ed. R. Miliband and J. Saville, 241–77. London: The Merlin Press.
- Altieri, M. 1989. Agroecology: A new research and development paradigm for world agriculture. *Agriculture, Ecosystems & Environment* 27: 37–46.
- Altieri, M., and C. Nicholls. 2008. Scaling up agroecological approaches for food sovereignty in Latin America. *Development* 51: 472–80.
- Altieri, M., C. Nicholls, and F. Funes. 2012. The scaling up of agroecology: Spreading the hope for food sovereignty and resiliency, Working paper, Sociedad Científica Latinoamericana de Agroecología.

- Altieri, M.A., and P. Koohafkan. 2008. *Enduring farms: Climate change, smallholders and traditional farming communities*. Penang: Third World Network.
- Altieri, M.A., and V.M. Toledo. 2011. The agroecological revolution in Latin America: Rescuing nature, ensuring food sovereignty and empowering peasants. *Journal of Peasant Studies* 38: 587–612.
- Alvares, C. 2009. *The organic farming sourcebook*. Kolkata: Earthcare books.
- Aminzade, R.R., J.A. Goldstone, and E.J. Perry. 2001. Leadership dynamics and the dynamics of contention. In *Silence and voice in the study of contentious politics*, ed. R.R. Aminzade, J.A. Goldstone, D. McAdam, E.J. Perry, W.H. Sewell Jr., S. Tarrow, and C. Tilly, 126–154. Cambridge: Cambridge University Press.
- Amrita Bhoomi. 2016a. Farmer-to-farmer training session on Millets at Amrita Bhoomi | Karnataka, India [online]. <http://bit.ly/2cpcbXO>.
- Amrita Bhoomi. 2016b. La Via Campesina South Asia: Agroecology: Youth will be the change! [online]. *La Via Campesina South Asia*. <http://bit.ly/2cxwP3M>.
- Assadi, M. 1994. ‘Khadi curtain’, ‘weak capitalism’ and ‘Operation Ryot’: Some ambiguities in farmers’ discourse, Karnataka and Maharashtra 1980–93. *Journal of Peasant Studies* 21, no. 3-4: 212–27.
- Assadi, M. 2004. New social movements in Karnataka: History, strategies. *Karnataka Journal of Politics* 4: 72–88.
- Babu, R. 2008. *Action research report on Subhash Palekar zero budget natural farming*. Mysore: Administrative Training Institute.
- Badgley, C., J. Moghtader, E. Quintero, E. Zakem, M.J. Chappell, K. Aviles-Vazquez, A. Samulon, and I. Perfecto. 2007. Organic agriculture and the global food supply. *Renewable Agriculture and Food Systems* 22, no. 2: 86–108.
- Benford, R.D., and D.A. Snow. 2000. Framing processes and social movements: An overview and assessment. *Annual Review of Sociology* 26: 611–39.
- Bhattacharya, N. 2014. Politics, networking, and framing: A study of KRRS. PhD diss., University of Hyderabad.
- Brass, T. 1994. Introduction: The new farmers’ movements in India. *Journal of Peasant Studies* 21, no. 3-4: 3–26.
- Buradikatti, K. 2015. Yoga was a contribution of non-Vedic Dravidian tradition. *The Hindu*.
- Chand, R., and S. Srivastava. 2014. Changes in the rural labour market and their implications for agriculture. *Economic and Political Weekly*, 49, no. 10.
- Dabholkar, S. 1998. *Plenty for all*. Pune: Mehta Publishing House.
- Das, M., ed. 2005. *Karnataka human development report 2005*. Bangalore: Government of Karnataka.
- De Schutter, O. 2010. *Report submitted by the special rapporteur on the right to food*. Geneva: United Nations General Assembly, Human Rights Council.
- Deshpande, R. 2002. Suicide by farmers in Karnataka: Agrarian distress and possible alleviatory steps. *Economic and Political Weekly* XXXVII: 2601–10.
- Edwards, B., and M. Kane. 2014. Resource mobilization theory and social and political movements. In H.-A. van der Heijden, ed. *Handbook of political citizenship and social movements*, 205–32. Cheltenham, UK: Edward Elgar Publishing.
- Edwards, B. and J.D. McCarthy. 2007. Resources and social movement mobilization. In *The Blackwell Companion to Social Movements*, ed. David A. Snow, Sarah A. Soule, and Hanspeter Kriesi, 116–52. Oxford: Blackwell.
- Eisinger, P. 1973. The conditions of protest behavior in American cities. *American Political Science Review*, 67(1), 11–28.
- FAO. 2015. *Final report for the international symposium on agroecology for food security and nutrition*. Roma.
- FarmNest.com. 2016. FarmNest.com [online]. <http://bit.ly/1S9xKYq>.
- Freire, P. 1971. *Extensão ou Comunicação?* Rio de Janeiro: Paz e Terra.
- Friends of the MST. 2015. Sector of production, cooperation and environment [online]. Available September 22, 2015. <http://www.mstbrazil.org/content/sector-production-cooperation-environment>.
- Fukuoka, M. 2001. *The one-straw revolution*. 8th ed. Library. Goa: Other India Press.
- Gallagher, K. 2003. Fundamental elements of a Farmer Field School — AgriCultures Network. *LEISA Magazine*.
- Gamson, W.A. 1975. *The strategy of social protest*. Homewood, IL: Dorsey Press.

- Ganz, M. 2010. Leading change. Leadership, organization, and social movements. In: *Handbook of leadership theory and practice*, 527–68. Cambridge, MA: Harvard Business Review Press.
- Goldstone, J.A. 2001. Toward a fourth generation of revolutionary theory. *Annual Review of Political Science* 4, no. 1: 139–87.
- Government of India. 2011. *Census of India 2011*. Directorate of Census Operations.
- Government of Karnataka. 2006. *Karnataka agricultural policy 2006*. Bangalore: Department of Agriculture and Horticulture.
- Gulati, A., S. Jain, and N. Satija. 2014. Rising farm wages in India—The 'pull' and 'push' factors. *Journal of Land and Rural Studies* 2, no. 2: 261–86.
- Gulte.com. 2016. I am adopting Andhra Pradesh [online]. *Gulte.com*. <http://bit.ly/28tLuDO>.
- Hall, S. 1982. The rediscovery of 'ideology'; Return of the repressed in media studies. In *Culture, society and the media*, ed. M. Gurevitch, T. Bennet, J. Curran, and J. Woollacott, 56–90. London: Methuen.
- The Hindu. 2012. A campaigner for natural farming [online]. *The Hindu*. <http://www.thehindu.com/todays-paper/tp-national/tp-kerala/a-campaigner-for-natural-farming/article2936935.ece>.
- Holt-Giménez, E. 2006. *Campeño a campeño. Voices from Latin America's farmer to farmer movement for sustainable agriculture*. 1st ed. Oakland, CA: Food First Books.
- Hooli, S. 2015. Pawan Kalyan greets fans, farmers on Sankranti, adopts zero budget natural farming. *International Business Times*.
- IAASTD. 2009. *Agriculture at a crossroads: A global summary for decision makers*. The International Assessment of Agricultural Knowledge, Science, and Technology for Development. Washington, DC: Island Press.
- Ikegame, A. 2010. Why do backward castes need their own gurus? The social and political significance of new caste-based monasteries in Karnataka. *Contemporary South Asia*, 18(1), 57–70.
- Ikegame, A. 2012. The governing guru: Hindu Mathas in liberalising India. In *The guru in South Asia: New interdisciplinary perspectives*, ed. J. Copeman and A. Ikegame, 22–43. London: Routledge.
- Jain, A.K. and P. Gupta. 2012. Economic ideas of Lohia: Some aspects. *Mainstream Weekly*, L(14).
- Kadkol, P. 2014. KRRS protests against eviction of 'bagair hukum' farmers [online]. *The Hindu*. <http://bit.ly/1ULgXtS>.
- Kolmans, E. 2006. *Construyendo procesos 'De Campeño a Campeño'*. Lima: ESPIGAS and Pan para el Mundo.
- Kumara, T.V., P. Shah, S. Lakhey, D.V. Raidu, J. Killi, V. Kalavakonda, and M. Pillai. 2009. *Ecologically sound, economically viable: Community managed sustainable agriculture in Andhra Pradesh, India*. Washington, DC: The World Bank.
- Lamine, C., M. Darolt, and A. Brandenburg. 2012. The civic and social dimensions of food production and distribution in alternative food networks in France and Southern Brazil. *International Journal of Sociology of Agriculture and Food* 19: 383–401.
- La Via Campesina. 2013. *From Maputo to Jakarta: 5 years of agroecology in La Via Campesina*. Jakarta: International Commission on Sustainable Peasant Agriculture.
- La Via Campesina South Asia. 2011. Asian farmers visit and learn from Karnataka's farmers about natural farming [online]. www.viacampesina.org. <http://bit.ly/1kU8irf>.
- La Via Campesina South Asia. 2015. Peasant agroecology cools the planet! Zero Budget natural farming and the road to resistance at COP 21 [online]. www.viacampesina.org. <http://bit.ly/1O9SfjK>.
- LVC South Asia. 2015a. Karnataka state farmers' association (KRRS) holds study camp for women farmers [online]. *La Via Campesina South Asia*. <http://lvcsouthasia.blogspot.in/2015/03/report-january-24-and-25-2015-karnataka.html>.
- LVC South Asia. 2015b. Call for participation in international AGROECOLOGY training at Amritha Bhoomi (India) October 28–Nov 5 [online]. lvcsouthasia.blogspot.in. <http://bit.ly/1tk0MdX>.
- Machín Sosa, B., A.M.R. Jaime, D.R.A. Lozano, and P. Rosset. 2013. *Agroecological revolution: The farmer-to-farmer movement of the ANAP in Cuba*. Havana: ANAP and La Via Campesina.
- Mansata, B. 2015. *The vision of natural farming*. Kolkata: Earthcare books.
- Martínez-Torres, M.E. and P.M. Rosset. 2014. *Diálogo de saberes in La Vía Campesina: Food sovereignty and agroecology*. *The Journal of Peasant Studies* 41, no. 6: 979–97.
- Mawdsley, E. 2006. Hindu nationalism, neo-traditionalism and environmental discourses in India. *Geoforum* 37, no. 3: 380–90.
- McCarthy, J.D. and M.N. Zald. 1977. Resource mobilization and social movements: A partial theory. *American Journal of Sociology* 82, no. 6: 1212–41.

- McCune, N. 2014. Peasant to peasant: The social movement form of agroecology. *Farming Matters -AgriCultures Network*.
- Melucci, A. 1996. *Challenging codes: Collective action in the information age*. 1st ed. Cambridge Cultural Social Studies. Cambridge: Cambridge University Press.
- Misra, S. 2008. Risks, farmers' suicides and agrarian crisis in India: Is there a way out? *Indian Journal of Agricultural Economics* 63, no. 1: 38–54.
- Mohanty, B. 2005. 'We are like the living dead': Farmer suicides in Maharashtra, Western India. *Journal of Peasant Studies* 32, no. 2: 243–76.
- Moore, J. 2016. Muslim lynched by mob in India had possession of beef, new forensics show. *Newsweek*, February 6.
- Morris, A. and S. Staggenborg. 2004. Leadership in social movements. In *The Blackwell companion to social movements*, 171–96. Oxford: Blackwell.
- Münster, D. 2016. Agro-ecological double movements? Zero Budget natural farming and alternative agricultures after the neoliberal crisis in Kerala. In *Critical perspectives on agrarian transition: India in the global debate*, ed. B. Mohanty, 222–44. India: Routledge.
- Murthy, S. and S. Indumati. 2011. Economic analysis of MGNREGA in the drought-prone States of Karnataka, Rajasthan and irrigation-dominated State of Andhra Pradesh. *Agricultural Economics Research Review* 24: 531–6.
- Nadkarni, M. 1987. *Farmer's movements in India*. New Delhi: Allied publishers.
- Nanda, M. 2003. Postmodernism, Hindu nationalism and 'Vedic science' [online]. *Frontline*. <http://www.frontline.in/static/html/fl2026/stories/20040102000607800.htm>.
- Nandakumar. 2012. Subash Palekar's zero budget no-till rice farming [online]. *My Experiments With Farming*. <http://bit.ly/1OFDff9>.
- National Crime Records Bureau of India. 2014. Accidental deaths and suicides in India [online]. Accessed June 13, 2016. <http://ncrb.nic.in/StatPublications/ADSI/ADSI2014/adsi-2014full-report.pdf>.
- National Sample Survey Office. 2005. *Situation assessment survey of farmers: Indebtedness of farmer households*. New Delhi: Government of India.
- Nehring, R. and B. McKay. 2014. Sustainable agriculture: An assessment of Brazil's family farm programmes in scaling up agroecological food production. The International Policy Centre for Inclusive Growth Working paper. no 123, Brasilia.
- Oberschall, A. 1973. *Social conflict and social movements*. Englewood Cliff, NJ: Prentice-Hall.
- Oliver, P., and H. Johnston. 2000. What a good idea! Frames and ideologies in social movement research. *Mobilization* 5: 37–54.
- Palekar, S. 2005. *The philosophy of spiritual farming I*. 2nd ed. Amravati: Zero Budget Natural Farming Research, Development & Extension Movement, Amravati, Maharashtra, India.
- Palekar, S. 2006. *The principles of spiritual farming II*. 2nd ed. Amravati: Zero Budget Natural Farming Research, Development & Extension Movement, Amravati, Maharashtra, India.
- Palekar, S. 2016. Zero budget spiritual farming [online]. <http://bit.ly/1Pk3a8p>.
- Palekar, S. n.d. *Is organic farming a conspiracy*. Amravati: Zero Budget Spiritual Farming Research, Development and Extension Movement.
- Parmentier, S. 2014. *Scaling-up agroecological approaches: What, why and how?* Belgium: Oxfam Solidarity.
- Patnaik, U. 2004. Principal task on the Agrarian front. *Social Scientist* 32, no. 7/8: 36–41.
- Piven, F.F., and R.A. Cloward. 1977. *Poor people's movements: Why they succeed, how they fail*. Contemporary Sociology. New York, USA: Pantheon Books.
- Van der Ploeg, J. 2008. *The new peasantries: Struggles for autonomy and sustainability in an Era of Empire and globalization*. London: Earthscan.
- Press Trust of India. 2016a. AP govt announces support to zero budget natural farming. *Business Standard*.
- Press Trust of India. 2016b. Naidu congratulates Subhash Palekar, Rajamouli. *Business Standard*.
- Pretty, J.N., J.I.L. Morison, and R.E. Hine. 2003. Reducing food poverty by increasing agricultural sustainability in developing countries. *Agriculture, Ecosystems and Environment* 95, no. 1: 217–34.
- Robinson, R., and S. Upadhyay. 2012. Revisiting communalism and fundamentalism in India. *Economic and Political Weekly* xlviI, no. 36: 35–57.
- Rosset, P. 1999. Ecological agriculture, part one: Small is bountiful. *The Ecologist* 29, no. 8: 452–6.
- Rosset, P. 2015. Social organization and process in bringing agroecology to scale. In *Agroecology for food security and nutrition proceedings of the FAO international symposium 18-19 september 2014, Italy*. Rome.

- Rosset, P., and M.A. Altieri. 1997. Agroecology versus input substitution: A fundamental contradiction of sustainable agriculture. *Society & Natural Resources*, 10, no. 3: 283–95.
- Rosset, P., and M.E. Martínez-Torres. 2012. Rural social movements and agroecology: Context, theory, and process. *Ecology and Society* 17, no. 3: 17.
- Rosset, P., B.M. Sosa, A.M.R. Jaime, and D.R.Á. Lozano. 2011. The *Campesino -to- Campesino* agroecology movement of ANAP in Cuba: Social process methodology in the construction of sustainable peasant agriculture and food sovereignty. *Journal of Peasant Studies* 38, no. 1: 161–91.
- Sanandakumar and Krishnakumar. 2014. Emerging entrepreneurs of Kerela: Actors Mammooty, Mohanlal, Srinivasan, Dileep invest in food business [online]. *The Economic Times*. <http://bit.ly/22R5L3n>.
- Sarma, P. 2016. Campaign to reduce use of chemical fertilizers, pesticides. *The Hindu*, May 28.
- Shivasundar. 2012. BJP in Karnataka: Between the devil and the deep blue sea. *Economic and Political Weekly* 47, no. 17.
- Snow, D.A., S.A. Soule, and H. Kriesi. 2004. *The Blackwell companion to social movements. Change*. Oxford: Blackwell.
- Staff Correspondent. 2005. Raitha sangha, DSS to launch ‘Sarvodaya Karnataka’ [online]. *The Hindu*. <http://bit.ly/25SPBL2>.
- The Timbaktu Collective. 2015. The Timbaktu collective | life, we celebrate you... [online]. Accessed October 7, 2015. <http://www.timbaktu.org/>.
- Tilly, C. 1978. *From mobilization to revolution*. Contemporary Sociology. New York: Random House- McGraw-Hil.
- Vakulabharam, V. 2013. Agrarian crisis in India. *Journal of Peasant Studies* 40, no. 1: 300–3.
- Varghese, S., and K. Hansen-Kuhn. 2013. *Scaling up agroecology. Towards the realization of the right to food*. Minneapolis: Institute for Agriculture and Trade Policy.
- Vasavi, A. 2008. Caste, capital and captaincy in the Karnataka elections. *Economic and Political Weekly* 43, no. 24: 10–1.
- Viswanathan, S., R. Krishnakumar, and P. Menon. 2004. The spread of Hindutva in the South. *Frontline*.
- Vyas, V.S. 2005. Agrarian distress: Strategies to protect vulnerable sections. *Indian Journal of Labour Economics* 48, no. 1: 19–28.
- Weber, M. 1968. *Economy and society*. Berkeley: University of California Press.
- Wezel, A., S. Bellon, T. Doré, C. Francis, D. Vallod, and C. David. 2009. Agroecology as a science, a movement and a practice. A review. *Agronomy for Sustainable Development* 29: 503–15.
- Wolf, E. 1969. *Peasant wars of the twentieth century*. New York: Harper & Row.

Ashlesha Khadse is part of the Coordination of the Amrita Bhoomi Centre, a peasant agroecology school in India affiliated with the Karnataka State Farmers Association (KRRS) and La Via Campesina. She formerly was at El Colegio de la Frontera Sur (ECOSUR) in Chiapas, Mexico. Email: ashlesha.khadse@gmail.com

Peter Michael Rosset is a professor and researcher at El Colegio de la Frontera Sur (ECOSUR) in Chiapas, Mexico, where he is part of the research group on the massification of agroecology. He is also a member of the technical support team of La Via Campesina and co-coordinator of the Land Research Action Network (www.landaction.org). Website: <http://www.ecosur.mx/academico/prosset/>. Email: prosset@ecosur.mx

Helda Morales is a professor and researcher at El Colegio de la Frontera Sur (ECOSUR) in Chiapas, Mexico, where she is the coordinator of the research group on the massification of agroecology. Website: <http://www.ecosur.mx/academico/hmorales/>. Email: hmorales@ecosur.mx

Bruce G. Ferguson is a professor and researcher at El Colegio de la Frontera Sur (ECOSUR) in Chiapas, Mexico, where he is part of the research group on the massification of agroecology. Website: <http://www.ecosur.mx/academico/bferguson/>. Email: bferguson@ecosur.mx