Chapter Three

Erosion of Farmer Field Schools in Ecuador: Politics of Agricultural Science and Development Practice

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Introduction

As a result of its impressive success as a knowledge-based, community-led approach for Integrated Pest Management (IPM) in Southeast Asia and elsewhere, in 1999 Farmer Field School (FFS) methodology was introduced in the Andes, initially to help communities overcome pesticide-health concerns. Eventually, the approach was adapted to other concerns in agriculture and natural resource management, including the sustainable management of small and large animals, local seed systems, soil fertility, and water for food production and climate change adaptation. Beyond helping to solve technical concerns, FFS was intended as a political device for shifting the designs of development practice from technology- to people-centric.

In this paper we examine the arrival and spread of FFS in Ecuador, accompanied by counter activity of a socio-technical regime organized around agricultural modernization. We hope to shed light on the fundamental conflict between present institutional designs and needed re-direction towards more adaptive agricultural science and development practice. The experience of FFS in Ecuador provides rare insight into the politics of institutional continuity and change involved in determining public policy. Our analysis shows that, in the context of an entrenched socio-technical regime, one cannot realistically hope to achieve people-centred adaptive collaborative management of agriculture and natural resources through the mere demonstration, documentation, and promotion of a radical methodological approach such as FFS. We present evidence of how competing actors involved in science and development of FFS organize around prestigious symbols and become active in the processes of translating and transforming the people-centred character of FFS into a technical package. We then draw implications for innovations linking methodologies with wider socio-technical regime.

Needed transition in agricultural science and development

Although agricultural modernization has led to increases in food production and economic growth in many places, the recent International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD)[1] as well as an exhaustive study by the US Academy of Sciences (NRC 2010) concur that the benefits often have not been equally distributed and gains have come with severe social and environmental costs that place into question the sustainability of past contributions. As a result, the IAASTD concluded with a call for "… a fundamental shift in science and technology policy and practice that maintains and enhances environmental and cultural services, while increasing sustainable productivity, and safeguarding nutritional quality and the diversity of food and farming systems."

A socio-technical regime, such as that which became organized around a global project of agricultural modernization project during the second half of the 20th Century, can be seen as both a factory and a storehouse of institutional perspectives and arrangements that enable and regulate the use, development and survival of a particular value system, sets of rules and technical processes and products. Many of today's most impenetrable problems – e.g., mass pesticide poisonings, global-scale overweight/obesity and global warming -- are embedded in past 'solutions' of science and development. Thus, there is growing concern over how the institutions of Science and Development can become organized around more pluralistic and sustainable purposes. In order to ground a discussion on this concern, we draw on the experience of Farmer Field Schools (FFS) in Ecuador - a strategic niche-level intervention intended to re-direct public policy towards more promising futures.

FFS by design: from technology to people

During the 1990s, the harmful consequences of agricultural modernization in Ecuador - in particular, severe health problems associated with pesticide exposure, degrading soils, and declines in productivity (Crissman et al. 1998; Sherwood 2009) – made a growing number of people became concerned over industrial era technology, leading to rising waves of protests and questioning of public policy. As a result of impressive success of FFS methodology in Integrated Pest Management (IPM) in Southeast Asia and elsewhere, colleagues at the International Potato Center (CIP) invited the FAO's Global IPM Facility (GIF) to help introduce Farmer Field Schools in Ecuador (as well as Peru and Bolivia) (Sherwood et al. 2000).

[1] www.agassessment.org

FFS-methodology emerged as an explicit response to the adverse consequences of modern, industrial era rice farming in Asia, especially the health and environmental effects of pesticides (Kenmore et al. 1987 and Kenmore 1991). As a high-order, interactive lay-expert learning approach based on well established principles of adult education (e.g.discovery-based learning), ecological literacy (filling knowledge gaps on the existence of beneficial organisms) and social learning (adaptive, collaborative learning in heterogeneous contexts), FFS aims at enabling individuals and groups of farmers to address their social, human health, and environmental problems (Pontius et al. 2002; Luther et al. 2005). Over time, the approach progressed from farm-level to community-level learning and action.

Instead of seeking to 'feed' participants answers to their problems, the FFS convener operates not as a teacher but a facilitator, involving farmers (i.e., men, women, and children) in group learning and explorations of their priority concerns. Through open-ended experiments, individuals fill knowledge gaps, in particular the 'hidden' ecological phenomena, while learning how to work with others in finding solutions. The learning-action agenda is transdisciplinary in that it responds to the array of matters experienced in agricultural production: the interactive agronomy of soils, plants, and pests, marketing, and social concerns. Rather than blindly promote specific technologies, participants systematically invent and test alternatives in comparative trials in their community. Thus, FFS can be viewed as a strategic departure from the expert system and its modernisation project based on the 'extension' of pre-conceived and -packaged solutions.

Between 1999 and 2004, GIF and CIP implemented a series of Training of Trainers in FFS and they implemented closely monitored pilots as a means of demonstrating the potential of the methodology and building a multi-organizational support network involving private and public sectors (Luther et al. 2005). After three seasons, studies documented very impressive results (Barrera et al. 2001 and 2004; Borja 2004). By 2003, hundreds of farmer groups in the country expressed interest in establishing their own FFS programmes, leading to a phase of rapid growth or scaling-up. Thus, FFS entered the 'social wild' of development practice, where new organizations arrive to learn about and utilize an innovative approach for their own purposes.

FFS in practice: from people to technology

Due to the growing international popularity of FFS in the mid-1990s, people from the International Potato Center (CIP), Instituto Nacional Autónoma de Investigación

Agropecuaria (INIAP) the Ministry of Agriculture (MAG), non-governmental organizations (NGOs) and the agrichemical industry showed interests in FFS. Each signed up for training and invested resources in introducing the methodology as part of their own professional agenda.

Initially the adaptation in Ecuador was consistent with the methodology's original proposals in Asia, in terms of the themes of interest, field conditions, and cultural practices (Paredes, 2001; Borja, 2004; Pumisacho and Sherwood, 2009). Nevertheless, as summarised in Table 3.1, over time FFS-in-practice underwent major changes in design, content, and process management, leading Sherwood and Thiele 2003 to argue that the people-centred elements of the methodology were being eroded. In the social wild of spontaneous appropriation of the methodology by new actors, FFS became vulnerable to competing interests, and indeed it underwent re-formulation.

Table 3.1. Divergent expressions of FFS (based on Schut and Sherwood, 2007)

Criterion	FFS by design (in pilots) (Paredes, 2001; Borja, 2004)	FFS in practice (5-7 years later) (Sherwood and Thiele, 2003; Schut, 2006)
Goals and didactics	Challenge conventional practices through open-ended, farmer-led innovations and experiments. Based on discovery-based-learning an learning-by-doing	Transfer of knowledge and technology, diffusion of IPM-packages through learning
Learning process	Open-ended	Project-based
Decision making	Based on analyses and discussion	Based on assumptions, generalisations and routines
Facilitation	Participative, enthusiastic, working with the farmers	Steering, demonstrative and lecturing
Agenda setting/ ownership	Organised around the growth stages of a crop or animal. FFS	Organised within the boundaries of organisational and donor

	participants chose crop and determine curriculum and experiments, experience ownership and responsibility over learning processes and activities	preferences. FFS participants are passively involved, facilitator chooses crop and determines learning processes and activities
Long term objectives	More explicit knowledge, independent problem-solving skills, empowerment	Learn what is being taught, adopt and diffuse expert technologies

After the benefits of FFS became overwhelmingly clear and the methodology became legitimized as 'best practice', many of the very same actors began to claim ownership of it. In the process of taking over, however, these actors systematically changed FFS around new purposes. The facilitation of open-ended discovery learning became specialised top-down lectures. Questions became answers. The content and processes of FFS were simplified to the point where differences between individual FFS were lost. Consistent with the design features of expert systems, FFS underwent degrees of homogenization. Rather than broaden expert production of knowledge using people-centred approaches, we observed that the experts and their organizations commonly sought to transform FFS in line with their competing priorities. Within that process, FFS was pulled from a people- to a technology-centred paradigm.

For example, early on a group of researchers at CIP and its national partners hybridized FFS to "Farmer Field Schools-Farmer Participatory Research" (FFS-FPR) (Mendizabel 2002). This involved shifting technical content around institutional research priorities, such as pesticide-use efficiency (Torrez et al. 1999a and b) or selection of plant disease resistance varieties (Nelson et al. 2001; Ortiz et al. 2004). We found that researchers commonly increased the complexity of single variable demonstrations to the point where FFS began to include dozens of variables and other subtleties, where the outcomes of FFS experiments could only be seen through sophisticated statistical analysis.

Similarly, in the hands of development experts FFS became diversely packaged and sold to donor agencies for diverse, sometimes contradictory purposes: as means to 'organic' or 'clean production' (e.g., by INIAP and EcoPar), 'pesticide-use reductions' (CIP), and 'increases

in productivity' (IPM-CRSP). The expected outputs of FFS became part of an individual or institutional marketing strategy. Researchers and development professionals and their organizations reduced FFS from a participant-led, multi-faceted and iterative learning-action methodology to a relatively pre-determined and standardized means of technology transfer.

Scaling-up in name but not in meaning

Over time, FFS methodology was pulled back into the dominant institutional paradigm it was supposed to challenge. Supporting collaboration amongst farmers in local innovations became top-down technology-transfer, and the farmer-led, demand driven character was replaced by externally driven extension and development. Reasons can be found in the hierarchical and formal organization of national research and development institutes such as CIP and INIAP, where disciplines, procedures, protocol, mandates and responsibilities were clearly formulated, respected, and defended. Moreover, funding structures, time-constraints and donor-demands often did not provide sufficient space to adequately respond to the needs and interests of farmers.

FFS by design emphasized new sensibilities around local knowledge and ecology-based production, and it aimed to enable farmers to be able to address the concerns generated by the earlier 'solutions' of expert-based agriculture, particularly the health effects due to chronic exposure to highly toxic pesticides. On the surface, it appeared that expert-organizations, such as CIP, INIAP and MAG, favoured more pluralistic science and development. Nevertheless, in retrospect we found that the institutions of technical experts never seriously entertained FFS as a people-centred approach, and they showed even less interest in being part of a broader farmer-led movement for social change. While FFS scaled in name in Ecuador, its fundamental principles often were lost in translation. Instead of enabling desired institutional change, scaling exposed vulnerabilities that led to fundamental transformations, and the potential of FFS as a symbol for radical institutional change was lost.

Nevertheless, the experience of FFS in the social wild suggests that in practice these actors continued to enforce expert-led knowledge production. In essence, we see that a people-centred methodology was scaled-up in an environment where institutional pre-conditions were not only absent but also largely resistant to change.

Nevertheless, outcomes were not homogeneous, as actors on the margins of the agricultural modernization project remained open to the possibilities around, and even beyond, FFS. By 2011, the few remaining examples of people-centred FFS continued to operate, in particular those led by community volunteers and organizations, with their identity as a counter-movement to the green revolution, such as the agro-ecology movement. In these cases, strong internal organization, self-financing, and a diversification of activity permitted the continuation and deepening of FFS, suggesting that methodology had gained a social foothold, if seemingly minor. While it did not appear that people-centred FFS would continue to grow into an increasingly coherent body of knowledge capable of defining and enforcing rules of 'good' agricultural science and development practice, seeds of change have been planted. This includes the rise of consumer groups from marginal urban neighbourhoods in six cities, known as the Canastas Comunitarias ("Community Food Baskets") (Kirwan 2008; Garcés and Kirwan 2009). Learning about FFS, the *Canastas* began to meet with groups of FFS graduates to negotiate new consumer-grower arrangements around 'healthy food', a concept preoccupied with not just the end product of commodities but also with the production process itself as well as consumer-producer relationships.

Overall, however, FFS in Ecuador was largely transformed in the hands of researchers, extensionists and farmers and their organizations and projects to the point where the methodology no longer represented a serious threat to established ways of thinking, organizing, and doing in science and development practice. In the process, the original idea of FFS as a means of adaptive collaborative management appeared lost.

Conclusion

In its public demonstrations of new possibilities and desirabilities, the FFS movement in Ecuador threatened established institutional norms and values of agricultural science and development practice. Progress in changing dominant patterns of thinking, organizing and doing hinged on ability of emergent actor networks to open up and defend new pathways of innovation. Following release into the social wild, however, competing interests in the form of the institutions tied to the expert system of agricultural modernization led to the transformation of central meanings and processes of FFS. This means that FFS was retained to serve established institutional purposes, as expressed in organizational mandates and objectives, operational modalities, funding priorities, and administrative procedures. In the process, FFS scaled in name but not in meaning.

The performance of FFS in the social wild of Ecuador exposes subtle features of institutional politics of change and continuity in relation to the attempts aimed improving resource management and development practices. The FFS experience in Ecuador clearly demonstrates that the calls for scaling-up methodology-based innovations such as FFS are overly simplistic. We saw change at the moment of attempting to scale-up the methodology, when the priorities of the project leaders shifted from FFS implementation to its diffusion. Institutional transition towards people-centred learning and collaborative management practice requires a discontinuity with the established socio-technical regime.

Clearly, in the context of an entrenched socio-technical regime, one cannot realistically hope to achieve people-centred adaptive collaborative management of agriculture and natural resources through the mere demonstration, documentation, and promotion of a radical methodological approach such as FFS. Transition implies transformation of assumptions about the underlying causes of poverty and environmental degradation, the meanings of 'best' and 'good' practices, and how learning and development should be supported and facilitated through policy. While the contradictions of agricultural modernization are increasingly apparent and change appears inevitable, it cannot happen without addressing existing power relationships that define and enforce the rules of science and development practice. While the contributions of FFS in Ecuador appear to be limited, its survival on the margins and linkages with growing networks of actors in the agro-ecology movement organized around the contradictions of modern food suggest that innovations in other forms may continue to influence institutional transition.

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