PROGRAM IN Agrarian Studies
YALE UNIVERSITY

# Food Sovereignty: A Critical Dialogue

INTERNATIONAL CONFERENCE
YALE UNIVERSITY
SEPTEMBER 14-15, 2013

Conference Paper #54

## The political ecology of market-oriented seed system development and emergent alternatives

**Kristal Jones**

The Journal of PEASANT STUDIES
critical perspectives on rural politics and development

T N I

YALE SUSTAINABLE FOOD PROJECT

Food First
INSTITUTE FOR FOOD AND DEVELOPMENT POLICY

ISS International Institute of Social Studies Erasmus

ICAS Initiatives in Critical Agrarian Studies

# The political ecology of market-oriented seed system development and emergent alternatives

**Kristal Jones**

**Conference paper for discussion at:**

**Food Sovereignty: A Critical Dialogue**
International Conference
September 14-15, 2013

**Convened by**

**Program in Agrarian Studies, Yale University**
204 Prospect Street, # 204, New Haven, CT 06520 USA
http://www.yale.edu/agrarianstudies/

**The Journal of Peasant Studies**
www.informaworld.com/jps

**Yale Sustainable Food Project**
www.yale.edu/sustainablefood/

**in collaboration with**

**Food First/Institute for Food and Development Policy**
398 60th Street, Oakland, CA 94618 USA
www.foodfirst.org

**Initiatives in Critical Agrarian Studies (ICAS)**
**International Institute of Social Studies (ISS)**
P.O. Box 29776, 2502 LT The Hague, The Netherlands
www.iss.nl/icas

**Transnational Institute (TNI)**
PO Box 14656, 1001 LD Amsterdam, The Netherlands
www.tni.org

**with support from**

**The Macmillan Center, the Edward J. and Dorothy Clarke Kempf Memorial Fund and the South Asian Studies Council at Yale University**
http://www.yale.edu/macmillan/kempf_fund.htm
http://www.yale.edu/macmillan/southasia

## Abstract[1]

This paper critically analyzes farmers' experiences with newly established seed markets for improved varieties in Sahelian West Africa. Market-oriented development approaches frame agricultural systems in dichotomous terms of modern or traditional, efficient or inefficient, and do not account for ongoing learning and adaptation by farmers. Two years of interviews with farmers who use improved variety seeds are analyzed here using a conceptual framework that combines the type of exchange, the type of seed and the value of the seed as three aspects of seed access decision making. The results show that as farmers gain skills about the benefits and trade-offs of each type of seed system, they make decisions that reflect both new experience and elements of the existing social and natural context. Based on the range of seed access priorities and decisions described in the data, suggestions are made for alternative seed diffusion projects that can meet the needs of specific individuals and communities. The analysis also provides the foundation for future work analyzing if seed system choice differs across groups of individuals.

## 1. Introduction

The dominant contemporary discourse of sustainable agricultural development combines modern scientific knowledge with market-oriented poverty-reduction approaches in an effort to integrate rural agricultural communities into the global agricultural system. Feed the Future, the United States Agency for International Development (USAID)-funded food security program, proclaims that "farmers – especially smallholder farmers – need to be integrated into the full chain of production, from farm to fork" (USAID, 2012). In sub-Saharan Africa, the Alliance for a Green Revolution in Africa (AGRA) seeks to apply "the power of knowledge and technology with an environmental touch," and takes for granted that "once improved seeds and soils engender higher yields, farmers need access to markets for their surplus," which then leads to increased well-being (AGRA, 2012a; AGRA, 2012b). The rhetoric of market-oriented agricultural development implies that scientifically and economically efficient approaches to agriculture are unequivocally preferable to 'unimproved' or non-market based decisions and systems. This rhetoric can lead to an either/or framing of current and changing economic and agricultural systems, in which traditional and also adaptive actions by farmers and communities are evaluated simply based on whether or not modern practices and technologies are present in singular form.

[1] Draft under review – do not cite without permission

This paper challenges the dichotomous framing of markets as formal or informal, agricultural techniques as improved or not, and economic decisions as rational or irrational. I present results from extensive fieldwork in Sahelian West Africa and analyze farmers' experiences with newly released improved variety seeds and newly established seed markets to characterize the range of new and ongoing decisions about seed use. Varietal development and seed access and diffusion have long histories in agricultural change in both developed and developing countries. Kloppenburg (2004) describes the shift in the United States away from local or regional seed production and reproduction practices and toward commercialized, standardized seed sales. This shift occurred in conjunction with the development of high-yielding hybrid maize varieties, which limited the potential for seed saving and experimentation. Descriptions and evaluations of the Green Revolution in developing countries highlight the role that improved varieties of wheat, rice and maize played in increasing yields, and the way that market-oriented input and output systems have affected different types of farmers differently (Evenson and Gollin 2003; Das, 2002).

Because of the integral role that seeds play as both an input in agricultural systems and a potential output (intentionally by producing second-generation seed or simply as grain that can be replanted), farmers can and do make a range of decisions about how to access seeds each year and what types of seeds to use (see Zimmerer (1996) for examples from Andean potato farmers). These decisions lead to different outcomes for different individuals, and are drive in part by the values associated with seeds and their production. I argue here that those values can include but are not limited to economic efficiency. Instead of the dichotomies inherent in market-oriented approaches agricultural development, farmers make decisions about several aspects of seed access and use as a dynamic process that incorporates new experience and information into existing social and natural contexts.

I apply Stone's (2004) idea of skilling, which suggests that through personal experience and social learning, farmers actively incorporate new knowledge and technologies into complex systems. Skilling is conditioned by local priorities, higher-level political and cultural narratives, and ecological possibilities, but remains a personal and social (rather than systemic) process. Because this research project focuses on improved varieties of sorghum and pearl millet that have come directly out of the participatory plant breeding (PPB) approach, which explicitly seeks to facilitate *in situ* ongoing experience and individual adaptation (Stone's (2007) environmental learning) (Ceccarelli and Grando, 2007), it is of particular interest to explore what type of skilling in terms of ongoing seed use might be occurring in areas with a history of PPB (Badstue et al., 2012). Rather than building on the contextual knowledge created and elicited throughout the PPB process to support seed diffusion and production models that are appropriate for a range of individuals, the projects studied here is largely moving toward the standardization and commodification of seeds and seed systems. By relying on market-

oriented development rhetoric and practice, the seed diffusion stage of these PPB projects is avoiding the critical questions of who benefits from the new varieties and how prioritizing market-oriented diffusion affects seed access and use. By characterizing several aspects of seed access for farmers in Sahelian West Africa and analyzing the different types of decisions being made in terms of if and how to use improved varieties, I seek to both highlight the exclusionary effects of a market-only approach and to add to the literature on alternative seed economies that might emerge in settings where markets are not appropriate for the social or natural context (see Gibson-Graham (2006) for discussion of diverse economies).

Section Two provides an overview of literature on seed systems and a conceptual framework for understanding three aspects of seed access – type of exchange, type of seed and value of output – in the current West African context. Section Three offers a description of the research setting and methodologies employed to present a more detailed framing for the specific findings presented here. I then present in Section Four a multidimensional analysis of how and why farmers in West Africa engage with the new seeds and new seed markets, in order capture the range of actions and potential impacts on agricultural and social systems. Finally, applying Stone's (2004; 2007) notions of skilling and deskilling in relation to improved varieties and seed markets, in Section Five I offer possibilities for alternative seed diffusion and production strategies not currently being supported by market-oriented approaches to seed system development.

## 2. Types and dimensions of seed systems

### *2.1 What is modern? What is traditional?*

Seed systems in modern agriculture combine economic ideas of the efficiency of supply chains with a belief in the superiority of standardized scientific knowledge. Many scholars, perhaps most notably Kloppenburg (2004), have traced the standardization of plant breeding and seed production over the past 40 years in the United States. An integral part of the story there is the privatization of crop research and development, which critics have argued has narrowed the range of production options and seed provisioning arrangements available to farmers (see Flora and Flora, 1989; Welsh and Glenna, 2006; Busch, 2010). There is also an extensive political ecology literature that critically analyzes the politically and economically exclusionary impacts of the commodification of agricultural production, challenging the notion that a single type of economic arrangement will provide benefit and access for all people (for example, Blaikie, 1985; Shiva, 1995; Yapa, 1996; Zimmerer, 1996). Gibson-Graham (2006) provides a framework for these critiques in her discussion of the universalizing modern discourse "in which capitalistic economic activity is taken as the model for all economic activity" (56). The analysis presented in this paper builds on this tradition by analyzing several dimensions of diverse seed economies currently emerging through the skilling process (Stone, 2004).

In contrast to the standardization of the seed economy through private investment in developed countries, seed systems in the developing world have had variable levels of public sector support in the post-colonial era, but have remained largely informal, heterogeneous and undercapitalized (Almekinders and Louwaars, 1999; Bentley et al., 2011). Despite some interest by multinational seed companies in the development of maize seed markets, there has been little investment to-date in West African seed systems by multinational seed companies and no investment in sorghum or pearl millet, grains with little chance of being sold as global commodities and so unlikely to generate strong enough demand for improved seed (Scoones and Thompson, 2011; Diakité et al., 2008). Instead, public national and international agricultural research institutes have focused on varietal improvement. With the emphasis on the market-oriented development and the second Green Revolution for Africa, funding is increasingly also focused on developing seed supply chains that mirror those of developed countries by connecting public research to private seed production and marketing (Toennissen et al., 2008). Rather than drawing in global corporations, however, the focus of AGRA's seed system development is on local private enterprise. AGRA supports small, private seed production companies as well as agrodealers, "plucky, dynamic, individual (usually male) entrepreneurs" who run small agricultural input shops (Scoones and Thompson, 2011). By stretching out the seed supply chain, market-oriented seed system development positions individual farmers as consumers with narrowly defined options for accessing only standardized, certified seeds.

In West Africa, seed laws are currently being established and harmonized with international standards, effectively tying all sanctioned seed system changes to the dominant value-chain approach to agricultural development (INSAH, 2009). It is now illegal to sell uncertified seeds, and certification is cost and land-prohibitive to many small farmers, since certain production and quality standards must be met. In one study site for this project, the farmer organization active in the area had the number of seed producers drop from 64 to 3 from 2009 to 2010, with the implementation of certification standards that include minimum field size. The formalization of seed production laws undermines the PPB approach to crop improvement, which professes the intention and outcome of supporting both the development of material improvements (seeds), and a range of skills and knowledge upon which farmers can build (Okali et al., 1994). In addition, the goal of market-oriented seed system development is to establish seed sales as the sole access point for improved varieties of sorghum and pearl millet, which stands in direct contrast to the social injunction against purchasing or selling seeds in many areas of Sahelian West Africa (Smale et al., 2008; Siart, 2006).

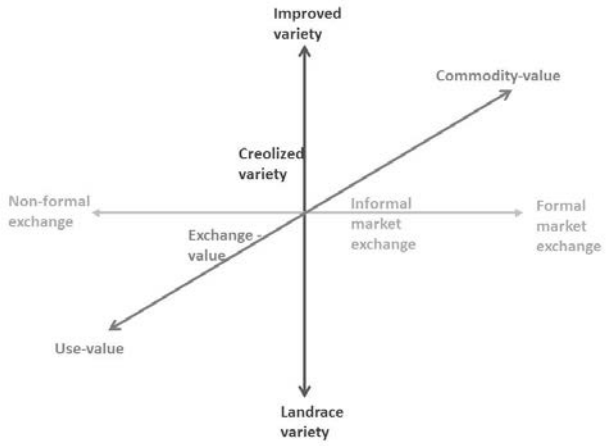
In contrast to the increasing push toward the disarticulation (à la de Janvry (1981)) of seed production, practitioners and critical observers of the market-oriented discourse describe a range of contemporary local or alternative seed systems as maintaining the reproductive

capabilities of traditional seed systems or as challenging the length (and so profit accumulation) of the supply chain by re-establishing productive capabilities within a smaller social and political group (Almekinders et al. 1994; Richards et al., 2009; Sperling and McGuire, 2010). Louwaars and de Boef (2012) draw a distinction between modern, profit-oriented seed supply chains, with commercial production and exchange at the core, and development-oriented supply chains, where appropriate and accessible breeding and seed diffusion is the main focus. A corollary to the profit-or-development distinction can be seen in the contrast between formal seed systems, strictly defined as systems in which seed production is certified and seed is sold as a distinct input at a standardized price, and informal seed systems, the wide-ranging 'everything else' that is not formal (Tripp, 2001; Lipper et al., 2010). As discussion of market-oriented and traditional seed systems continues to grow, there is a need to not only compare the two, but also to see formal seed systems as one of many possible configurations of seed access decisions that might be more or less relevant in different places and for different people. These distinct configurations combine to characterize a diversity of seed systems or seed economies, which are conditioned by the social and natural contexts within which they are set and which are not necessarily based on market logics (Richards et al., 2009; Gibson-Graham, 2006).

### *2.2 Dimensions of the seed system*

Figure 1 presents a conceptual model of the different dimensions of the seed system, from type of exchange to type of seed accessed and value of the output. As skilling (Stone, 2004) occurs differently for individual farmers across these dimensions, patterns of seed access and use will emerge to define both the limits of the modern or formal seed system as well as the characteristics of a range of alternative systems. Figure 1 builds on sociological and political economy critiques of the primacy of market integration and assertions of the embeddedness of economic priorities (Polanyi, 1957; Gibson-Graham, 2006). Decisions about the type of exchange, the type of good and the value of the good being accessed are all conditioned by individual and social context characteristics, with a range of options along each axis. Drawing on a long history of political economy and political ecology literature, I describe these three dimensions of economic decision-making in the context of seed systems in Sahelian West Africa, and will then apply the heuristic developed here to analyze farmers' experiences in changing seed systems.

**Figure 1: Conceptual framework: Three dimensions of seed access decision making**




Three key elements of economic decision-making are the type of exchange used to access a good, the type of good itself and the value of that good to the individual. Exchanges might occur across a spectrum that includes formal market structures, informal markets and non-formal exchange arrangements or self-provisioning (Hart, 2006). Hart (2006) describes informal markets as directly relational to formal markets, with non-formal traditional economic exchanges existing outside of this direct comparison. The establishment of local seed markets and producers in West Africa bring these different types of economic arrangements into direct contact with one another, so that all three exist on a continuous spectrum. A second critical element of an economic system is the type of good being accessed and who defines it, which has important implications for how and why it is accessed. Seeds can vary from those of pure improved varieties originating in formal breeding programs and produced through a certified process, to "creolized" varieties that evolve as improved varieties are saved and reused, to traditional landrace varieties managed by farmers and communities (Bellon et al., 2010). Of particular import are the biological properties of the species and varieties within the system, since these ecological realities influence the possibilities and limitations for seed use and reuse inherent in the biology of the species and varieties of seeds available to farmers (see Vayda and Walters, 1999, for a critique of the lack of attention to environmental characteristics in political ecology).

Finally, the value of the good to the individual, itself conditioned by the social and natural context, must be understood in order to better understand decisions being made to access it. In the case of seeds, farmers choose which varieties to access and how based on multiple varietal characteristics, which can be conceptualized as representing varying degrees of use, exchange and commodity value of the output (Marx, 1978). I highlight here Marx's (1978) description of exchange value as being an intermediate step between pre-capitalistic

economies based on primary use-value and fully commodified modern capitalistic systems. Exchange-value derives from context and can be conceptualized as local, in contrast to commodity-value, which (at least theoretically) is defined at a systemic, aspatial level. In practice, exchange-value is the price of grain in the local market, which varies with local preferences and seasonal needs, in contrast to the commodity-value of selling crops in standardized markets.

## 3. Methodology for empirical data collection

This paper offers analysis of data collected over two years of fieldwork in the West African countries of Mali, Niger, and Burkina Faso. These three countries share a history of French colonialism, and while composed of many ethnic and language groups, also share Islam as the predominant religion and significant social influence (over 90% of people in Mali and Niger are Muslim, and about 50% in Burkina Faso) (Kaba, 2005). In the study sites for this project, almost 100% of respondents were Muslim. The three countries also share a fairly similar ecological setting in the Sahelian zone, and all have primarily subsistence farming systems, with sorghum and pearl millet making up two of the top three crops grown in each of the three countries (SWAC/OECD, 2010; FAOSTAT, 2010). Because seed markets are currently in the process of being established within this region (through national and regional legal and development mechanisms), Sahelian West Africa is a unique site to study the phenomenon of how farmers experience the emergence of a formal seed system. Before 2010, the sorghum (in Mali and Burkina Faso) and pearl millet (in Niger) seed systems were largely traditional or non-formal, with farmers saving and replanting grains selected from their own or neighbors' fields (Coulibaly et al., 2008; Diakité et al., 2008). Improved varieties developed by national or international public breeding programs were distributed through aid and demonstration trials, and were sometimes for sale in large quantities for commercially oriented farmers. By 2010, however, less than 20% of the total area of sorghum or pearl millet in West Africa was planted with improved varieties (Alene et al., 2011). Over the past five years, there has been a renewed emphasis on developing market-oriented seed systems, and a range of development organizations are focused the creation of local (national and intra-regional) private seed companies and seed sellers (Dalohoun et al., 2011). The project studied here, implemented by an international agricultural research center (IARC) in the region, fits into this market-oriented approach by supporting farmer organizations in certified seed production and seed marketing training. All of the varieties of sorghum and pearl millet being sold in the sites analyzed here are conventionally bred, open-pollinated varieties – there are no hybrids or genetically modified seeds of any kind.

Data gathering occurred from January to May of 2011 and 2012, in five sites across the three countries. All sites are a group of villages clustered around a small, local administrative capital

town, and are areas where the IARC has ongoing relationships with farmer organizations and unions. This project is being done in conjunction with current seed systems projects that build on PPB work over the past ten years, and therefore some farmers in each site have had direct experience with the improved varieties that are now being diffused through the seed system project. However, with the sale of improved variety seeds by local seed producer organizations, any farmer in a given area theoretically has access to improved variety seeds through a range of possible access points. The population of interest, therefore, is farmers using improved variety seeds, and the sampling frame is stratified by possible access points: farmers who purchased seeds, farmers who received seeds through non-market exchanges with other farmers, and farmers who received seeds through PPB testing. Seed sellers keep lists of seed buyers each year, and the IARC technicians keep lists of PPB testers. Individuals who receive seeds, however, are not easily documented, and so I used a snowball sampling approach to find these "second-order" seed users, by asking those who bought and those who tested the seeds to whom they have given seeds in the previous year (see Biernacki and Waldorf, 1981, for snowball sampling). Once each list was established, I randomly sampled within each stratum, and then visited each farmer in 2011 and 2012 to conduct individual interviews about their seed access decisions and experiences during the previous planting season. Table 1 gives a summary of the sample sites, sample size by strata and gender makeup of each stratum.

**Table 1. Summary of research sites and stratified sample statistics**

| | **Seed buyers** | | **Seed receivers** | | **Seed testers** | | **Site totals** | |
|---|---|---|---|---|---|---|---|---|
| **Field site** | Male | Female | Male | Female | Male | Female | Male | Female |
| Siby, Mali | 27 | 9 | 0 | 1 | 0 | 13 | **27** | **23** |
| Dioila, Mali | 35 | 3 | 3 | 0 | 1 | 14 | **39** | **17** |
| Dédougou, Burkina Faso | 64 | 7 | 4 | 1 | 2 | 15 | **70** | **23** |
| Serkin Haoussa, Niger | 50 | 29 | 5 | 25 | 1 | 0 | **56** | **54** |
| Bokki, Niger | 26 | 3 | 1 | 0 | 0 | 0 | **27** | **3** |
| **Strata totals** | **202** | **51** | **13** | **27** | **4** | **42** | | |

Initial analysis of qualitative results is presented here, through thematic coding of farmers' comments relating to each aspect of seed access decision making. Because the goal is to characterize the whole range of decisions for each dimension of the seed system identified in Figure 1, the analysis presented here is not intended to quantify the frequency of certain actions or demographic characteristics of which individuals engage with which seed systems. Instead, the qualitative data are analyzed to better understand if and how skilling is occurring across multiple dimensions of West African seed systems. This analysis fits into a broader

mixed-methods project that also uses quantitative analysis to assess differences among groups (men and women, across countries, for sorghum versus pearl millet systems) in terms of which seed economies in which they choose to engage.

The analysis presented below offers first-hand explanations of what decisions farmers in West Africa are making about seed access and why. Indirect quotes are presented here due to the multiple levels of translation necessary for this work – I speak French to an interpreter, who translates into and back out of a local language. While transcribing, I then translate the conversations into English, for ease of analysis and presentation. Therefore, I do not purport to conduct discourse analysis with the interview data, since specific word choice will vary across multiple points of interpretation. Instead, taking as a starting point Temple and Young's (2004) assertion that translation in an ongoing aspect of qualitative research, I feel confident that the care with which all translation has occurred in this project maintains the meaning and intention of farmers' individual comments, so that thematic analysis is an appropriate and accurate use of this qualitative data. The quotes analyzed below are presented as they are spoken in French by the translator to me. Therefore, the third-person pronouns ("she said that she bought seeds") refers to the farmer being interviewed.

## 4. Dimensions of seed systems in contemporary Sahelian West Africa

### *4.1 How do farmers access seeds and what influences these decisions?*

In talking about their experience of new seed markets, many farmers drew comparisons to the past, explaining that before, *in the field, they harvested the best panicles, they attached them, and those were seeds. Or if you didn't have seeds, you could ask another farmer, and he would give you a little. But now, you have to pay, to have seeds.* It is a significant economic and social transition in the Sahel to be able to buy sorghum and pearl millet seeds, and people have a range of perspectives about it. Some appreciate the stability of the formal market: *It used to be that if we needed seeds, we had to go to our parents and relatives – it could take all day to travel. Now we can go to the shop whenever we need something.* The formal markets demand standardization and identification, because the seeds must be certified and labeled, and many people appreciated that with *seeds in the shops, you get a lot of information and choice*. The skilling (Stone, 2004) that occurs as farmers become familiar with varieties and their unique traits supports an appreciation for the standardization and differentiation provided by formal market sales. Another type of skilling is evident in the point made by a few seed sellers, who appreciated the impersonal nature of formal seed sales, saying that if sales happened within a clearly marked shop*, they would know that the sales weren't just for me*. Seed sellers have experienced farmers' distrust with seed sales, and have learned that the setting of seed sales signals to farmers that a certain type of exchange is taking place, one that exists within an economic realm apart from interpersonal connections.

For many people, separating the social and economic contexts was either undesirable or simply not a natural way to talk about exchange decisions. Seed producers mentioned that from an economic standpoint they have to sell improved variety seeds, since *you will lose money if you give them away – but people think you are mean if you don't share*. For some seed producers, this has meant selling seeds they have produced for the formal market at a lower price to relatives and people within their own village, emphasizing the expectation and desire to take care of one's own. Environmental factors, particularly drought, were often discussed as a main reason farmers use informal markets: *what they grow isn't enough to feed them, they eat all of their harvest. So before the rainy season, the farmers go to the market, and get seeds for themselves*. Farmers who have grown improved varieties as grain, not as seed, will sometimes sell second-generation seed to those who ask for it, in part to make money but also as a way to make sure more people can access some of the benefits of these seeds. When I asked one farmer who has a long history with the improved varieties if he sells seeds directly from his field, he replied that he doesn't charge as much as in the shop, since *it's the family, it's among us*.

Implicit to informal exchange, then, is a non-economic evaluation of other priorities that push someone to operate outside the benefits, costs, and logic of the formal market system. Hart (2006) describes informal markets as relational to, or directly contrasting with, formal markets in order to highlight the role that the social setting plays – the formal, standardized value of a good is taken as the benchmark against which informal prices and sales are made. In Sahelian West Africa, a strong social ethic toward helping one's family and neighbors seems to play an important factor in many of the informal market options extended by seed sellers, and provides an alternative access point to improved variety seeds for farmers who are pushed by a range of factors to seek out seeds. It is difficult at times to get people to talk about the informal market structures, since the seed producer organizations, supported by development projects, are focused solely on establishing formal market structures and discourage non-standardized production and sales.

In addition to formal and informal market exchanges, where money is used to signify a standard price associated with improved variety seeds, farmers describe a range of non-formal exchanges and self-provisioning decisions that are also based on the social and natural context. It was explained over and over to me that in the past, there were only gifts and exchanges, so that now, *people come for [improved varieties] and want to exchange for their local varieties – that's what people are used to*. Some farmers have incorporated aspects of the informal market into non-formal exchanges by insisting on the value-added that comes with improved variety seeds. *She tells them that these are seeds you can't give for free. So those who come, if they need one measure, they can give two measures of the local variety in exchange for one measure of the improved variety. Because these are seeds that have worth.* These non-monetary, non-

formal exchanges are an important synthesis of farmers' experiences with the new seeds both costing money and being valued for their quality, and the various social and economic realities within which seed systems are set, like the conviction that *seeds aren't something to be sold*.

Other non-formal exchanges that incorporate some aspect of economic value are based on each individual's available resources – if not cash, then possibly labor. *She said that, the women, to have seeds, they go to a farmer's field, to work. After working, the farmer will give them a certain amount…So the women work for seed.* These types of non-formal exchanges are appropriate to the social context, where labor and inputs like seeds are important resources in the agricultural system and carry some value within an exchange system, but cannot always be accessed by individuals using cash. This is particularly true for women, whose economic role is quite limited by social and Islamic religious expectations of staying close to the home, but who can work together in groups to earn some type of remuneration.

In contrast to non-formal exchanges that still mirror the relative worth established by the formal market, others seem to be based solely on social priorities of care, with the only economic goal being to break even: *he got seeds from a seed producer in his village, and will pay them back at the end of the season [in seed]*. Seed loans are of no benefit to the lender, but can be hugely important to the recipient, who will hopefully harvest enough to both pay back the loan and have a surplus to meet food and other needs. For many people, equal exchanges, measure for measure, are the basic rule, so that one ends up with equal quantity, regardless of relative quality. Gifts are a sort of unilateral exchange, and done out of personal motivations within the social setting. For example, a few farmers, when talking about gifts of seeds, have invoked the Muslim tradition of zakat, which requires charitable giving by those who are able. There is also a more general social expectation that *we give if our relatives come to ask, but if it's someone else, we exchange*. It's important to remember that many of these statements are being made about seeds that were initially purchased with cash, giving them a specific economic character. As the seeds pass into individuals' social milieu, non-economic evaluations of how best to use and reuse them are often stronger influences than calculated economic rationality.

An additional access point for improved variety seeds, from a farmer's perspective, is seed saving and self-provisioning. Seed saving is the most basic and common type of seed access for local varieties, and is foundational to local seed systems, in the absence of improved varieties. Respectively in 2010 and 2011, 73% and 71% of farmers interviewed saved improved variety seeds, and many talked about saving these seeds for as long as they continue to do well, to produce or look like the variety originally purchased. Some farmers, however, were unsure about how seed saving fits with improved varieties: *He overheard someone in the market talking about how you can't save these seeds to replant them. He saved some anyway, but was*

*worried about what would happen.* As Yapa (1996: 73) suggests, seeds are a "discursive materialist formation," and the discourse surrounding market-oriented seed systems makes it clear that a variety is no longer pure or completely improved if it is saved outside of an official seed production process. How farmers think about the categories "improved," "local" and "mixed," however, offers a different lens through which to characterize seeds and their relative value to farmers.

### *4.2 What kinds of seeds are farmers interested in and how do they characterize them?*

Following Yapa's (1996) characterization, seeds are a nexus of political, economic, social and environmental influences, and the analysis of seed type presented here demonstrates that the ways that seeds are labeled reflect this intersection of influences. Improved varieties are categorized from a biological standpoint as being genetically uniform, from a political standpoint as being unique and registered, and from an economic standpoint as being identifiable with reliable specific characteristics. From a social standpoint, any of these definitions are potentially meaningful depending on context, and pieces of each are evident in farmers' descriptions of the new seeds. First and foremost, however, improved varieties are just that – new. There is an inherent interest in and assumption that something new, coming from outsiders, will be better, and at the very least, worth trying. Once farmers have experience with improved varieties, they begin to characterize them based on these experiences, the positives and negatives, and define them relationally with local varieties. The question of cross-pollination, more immediate for pearl millet than for sorghum but possible in both systems, seems secondary to the discrete categories that define the idea of each varietal type. In other words, there can be degrees of local-ness or improved-ness, but the degree of mixing is only important when the variety reaches a critical threshold of undesirable change, a threshold that will vary for different individuals and in different settings.

For many people, improved varieties are those that can perform in changing natural conditions, particularly in terms of drought. *People are abandoning local varieties because there's not enough rain for them – they're going to disappear!* Another corollary for drought-tolerance is a short cycle, since a crop that matures faster is less susceptible to an early end to the rainy season. *Now, the early maturation counts more, because of the rain*. In general, people use these phenotypic traits to identify improved varieties, which for some are a hallmark of improved varieties: *Before, with local varieties there weren't distinct varieties, they were all mixed. Now, with improved varieties, you can see the characteristics of each one and choose them separately*. As long as a variety maintains its key features, then, it is identified as improved, regardless of the underlying genetic changes that might occur through seed saving. When variation begins to be apparent – that is, when an improved variety becomes phenotypically creolized – then farmers make the decision to "renew" or "refresh" their seeds so as to increase the consistency of key traits.

For many other farmers, the same type of definition applies to local varieties – their traits must be known, distinguishable, reliable. By focusing on the physical characteristics of the plants, improved and local varieties can consistently be compared to one another, and decisions made accordingly: *they got mixed together with the local varieties, but he recognized some of the plants when he replanted this year, and cut some panicles for next year*. Though describing varieties based on their unique characteristics is hardly a new phenomenon for farmers, the skilling that comes with talking about improved varieties means that now varietal decisions can be made based on categories of ideal types, rather than on relative levels of different traits. For some, this means that because *he knows the characteristics of his local variety, and he's used to planting it*, local varieties will be reinforced as the most adapted in a given context, proving better than an improved variety. In the other direction, improved varieties can take on the familiarity of local varieties, *almost becoming their local variety*. Improved and local varieties are relational to one another, a contrast that maintains the idea of discrete ideal categories but does not capture the degrees of change, or creolization, that most farmers have also experienced with both types of varieties.

There was less direct discussion of the genetically in-between creolized varieties, with people simply remarking that they *noticed this type of thing in her field. A change that changes these improved seeds until they look like local seeds. Even local varieties, they also can change*. For some, there is a calculation in trade-off between the amount of mixing and the relative benefit of the seeds, so that creolization is an acceptable cost to pay for a year or two in order to not repurchase seeds every year: *he personally, he replants the seeds one time. After the second use, for* [an improved variety]*, if he plants the first generation, after the following year, he replants, and then he will no longer use them.* The biological nature of the seeds and plants continually changes the actual impact of creolization (with more mixing each year leading to less and less of the specific desired traits). How long this mixing is accepted will depend on an individual's economic situation, as well as the broader seed system and what types of access points are available for improved variety seeds.

Just as the definition of creolization can be focused on economic and genetic evaluations, effectively creating a negative discussion around the degradation of genetic characteristics, it can also be framed in terms of hybridization. Some farmers have mentioned adopting another system, which a plant breeder once referred to as "informal hybridization." *They mix HKP* [an improved variety] *seeds with local seeds, to make their own crosses, which look like local millet. That allows them to have a variety is a little earlier-maturing than the local millet*. Creolization as a positive, proactive hybridization decision is another type of skilling gained by farmers in the process of learning about and experimenting with improved variety seeds. Skilling about the new range of seed types and exchange types then leads farmers to make seed access decisions based upon their expectations for how the output will be useful to them.

### *4.3 What is the value to the farmer of the seeds and what they produce?*

Market-oriented development approaches are predicated on systemic goals of overall market integration, so that input and output decisions can all be made within the profit-maximizing economic system. For farmers and seed systems, this means that one assumption of establishing formal seed systems is that the extra money spent on the input (seed) will be earned back, and then some, by the sale of the output (the grain or next generation of seed). In other words, market-oriented development seeks to commodify seed and grain, so that value is standardized and rational cost-benefit analyses will lead farmers to integrate fully into the market system. Commodified goods require a formal market system, and individuals making decisions about commodities in turn reinforces the market systems in which they are sold. Given the assumed superiority of market systems at generating profit, are farmers in West Africa in fact making decisions about seed use based on the commodity value of their output? In a word, no. Instead, fairly often, *the goal is first of all to eat, then to look for money*. For many farmers, the use-value of the grain they produce continues to be a more immediate and relevant concern than its ability to be exchanged or commodified. The value of the grain to an individual influences how he or she will access the improved seeds, and purchasing them as an input is part of an equation of relative use-value leads to different calculations than profit maximization.

Many farmers appreciate the use-value of the improved varieties, as meeting their families' food needs is still the primary goal of all production decisions: *He is now self-sufficient in grain, with improved varieties – he didn't have to buy any grain this year*. The use-value of these seeds is embodied in the fact that they mature early and so provide food during the hungriest time of the year, as well as the fact that they supply quality fodder for livestock. Farmers will purchase the seeds because of the use-value to them, and are not making calculations about the monetary profit that they will gain from investing in this input. Instead, both use-values and the lack thereof condition the amount of improved varieties an individual will grow. Many people mentioned that *the yield is better with improved varieties, but the tô* [local dish] *is better with local varieties*. When use-value is the primary motivator to use improved varieties, the cost of these varieties can quickly become an impediment to their sale, since they are not being used in a market system where investing in them at the beginning of the season will create a monetary payoff at harvest time. The price dissuades many people from using the seeds, *and that's what makes people go back to the local varieties*. Setting market prices that assume either exchange or commodity-value of the output will keep those primarily interested in the use-value of improved varieties out of the formal market. Instead, alternative seed systems that allow farmers to access seeds using the means available to them in non-formal exchanges support those making use-value decisions.

Many farmers in West Africa make non-formal, use-value, subsistence production decisions, and many, sometimes the same individuals, also engage in informal exchanges in local markets, making production decisions based on a combination of economic and social priorities and interests. Exchange-value in this context means value in both non-formal and informal exchange systems, where there is a known possibility to exchange grain for either grain, labor or some other non-monetary good, or to sell grain in local markets. Teasing out the exchange-values of an output, in this case, grain, requires a complex understanding of the various social and economic settings within which farmers might be able to trade what they have produced. For many people, use-value is still the primary motivator, but knowledge of exchange-value helps determine their decisions once their personal and family food needs have been met: *they keep part of the harvest for food and part to sell for things for their kids. They won't exchange the part that is for food, but if there is some of the part to sell left, they will exchange that*. Experience with improved varieties assures people that they will be viable for some type of exchange, should there be a need to use the grain to access other goods.

Appreciation for improved varieties also creates exchange-value for second-generation seeds, as they can be sold in the informal local markets for less than the certified formal varieties. A few farmers mentioned the skilling that has occurred as they capitalize on this unexpected exchange-value, creating a textbook informal market with a similar but less standardized product being sold for below formal-market prices. *When people come ask him, he often sells to them. Because there is a lot of demand. He sells one measure* [three kilos] *for 1,000 CFA* [compared to 1,500 CFA for certified varieties]. However, the exchange-value within the informal local markets for the grain produced is variable. In Burkina Faso, where sorghum beer is a common product made and sold by women, the exchange-value of improved varieties is less than local varieties in some cases, leading farmers interested in local exchanges to make decisions based on local market cues: *he grows grain to sell, and the women don't want the improved varieties for dolo* [beer]*, they want the local. So he will go back to growing the local variety*. By recognizing the local opportunities and limitations that condition the exchange-value of improved variety production, informal seed systems can offer more place-appropriate prices than the formal seed system, which assumes standardized commodity-value of the output.

Very few farmers talked in positive terms about the commodity-value of improved variety output, and when they did, it was almost always associated with outside project and international institutions. Several producer organizations have contracts with the World Food Programme (WFP), which has effectively created a commodity-value for their grain: *it used to be hard to sell what you produced, in the market. But with* [the union] *and* [WFP]*, it's not hard anymore*. The clearest commodity-value comes from the production of improved variety seeds, since the formal system being established by the market-oriented development projects is

predicated on seed commodification. It is surprising for many farmers that seeds are now something that can be relied upon to have not only exchange-value but commodity-value, and is understandably attractive to some. *She wants to be a seed producer. To earn more. Because before she didn't know that seeds were something that could be sold. She only sold grain, grain to eat*. Other farmers have experienced the limitations that derive from the commodity-value of both grain and seeds produced being codified mostly by external markets and institutions: *he's not going to produce seeds anymore, because it costs a lot and then the union will only buy a little bit of what you produce, so you have to sell the rest as grain*. Formal markets and the impersonal standardization they demand are often assumed in modern economic theory to be more reliable than the embedded informal markets and exchanges that depend on social context. However, formal markets are also more of a black box for an individual trying to make production decisions based on a range of values, and the uncertainty of the actual commodity-value of improved variety production has pushed some people back to their more known and understood informal exchange systems.

It bears noting the incredible emphasis that farmers put on the use-value of improved variety seeds, which is often framed as a contrast: *it's not about the price, it's about the value*. The value discussed in contrast to price can be understood as a type of cost-benefit analysis, where the monetary cost is compared not to the monetary profit gained, but instead to the usefulness of the output. *These seeds aren't expensive, when one seed can give you one kilo*. In some ways, however, the appreciation is even more basic than use-value, as using improved variety seeds is a response to uncontrollable ecological pressures: people *prefer improved varieties since now it rains less*. The way that many people talk about improved varieties is that they are a necessity not a choice: *if it was just local seeds, with the increase in population, there are always more mouths to feed. Without these improved varieties, actually, we wouldn't find anyone in the village. They would have all deserted it. Because with local seeds, you get almost nothing*.

## 5. Discussion and conclusion

The discourse around market-oriented development as it relates to seed systems assumes that individuals will recognize the standard value in improved variety seeds accessed through formal markets, and that they will make production decisions based on the commodity-value of their increased production. In other words, farmers will become increasingly skilled at market integration and utilization (Stone, 2004). Any alternative seed systems are implicitly less formal and less "improved," and so less efficient and less viable over the long term, than the conventional seed supply chain. This assessment, however, is based on economic and plant science understandings of efficiency, improvement and value. For many farmers in West Africa, the social and natural contexts shape a different set of priorities, needs and opportunities for

the use of improved variety seeds. Rather than a desire to move toward commodification, the social expectations of taking care of one's family and neighbors combined with an appreciation for certain traits in improved varieties have led many farmers to develop informal and non-formal exchange systems that balance the biological properties of the seeds, a recognition of the extra cost put into them, and an awareness of the limited ability of many people to purchase seeds with cash. In some ways, the slow pace of seed system development in Sahelian West Africa has provided farmers with the opportunity to gain and enact skills based on their ongoing experiences with improved variety seeds and market sales.

Stone (2004; 2007) chronicles both the skilling and deskilling of Indian cotton farmers with the arrival of GM cotton seeds. The skilling that occurred through experiential environmental learning and second-hand social learning allowed farmers to make decisions about the new seeds that were appropriate to their own settings (Stone, 2004). With a faster pace of technological change and more fluctuation in the choices of seeds and inputs, farmers were unable to gain sufficient experience with each new option, with the result being a deskilling process that left many farmers reliant only upon external information with which to make seed use decisions. The analysis presented here suggests that currently in West Africa, a skilling process is taking place for farmers, as they increase their familiarity with new varieties of pearl millet and sorghum, as well as the opportunities and constraints of formal exchange systems. The logic of the formal seed system is compelling to those individuals whose priorities for agricultural production are more oriented around commodity values. Others have combined the skilling process with existing social and economic priorities to formulate a range of diverse seed economies (Gibson-Graham, 2006). In order to engage in effective seed diffusion, particularly toward the end of development-oriented PPB projects, seed system researchers and practitioners should work toward a range of interconnected seed systems that build on the skilling process and are implemented at a pace that is appropriate for the context, so that skilling can continue (Richards et al., 2009; Stone, 2007).

Improved variety seed diffusion and adoption in West Africa will be more equitable and accessible to a wider range of individuals if seed systems based on reproduction and production without commodification are supported and facilitated by institutional actors, including national and international research centers. Reproductive systems could be at the individual level, with training for farmers on the seed saving techniques necessary to maintain the genetic traits of any variety, improved or local. One frustration mentioned by some farmers is the lack of coordination among individuals about which varieties are being grown, which increases the chances of cross-pollination. Because land is managed at the community level in villages in these areas of West Africa, a community seed provisioning system could be created if there is interest among enough farmers to grow certain varieties. Again, education about specific

varieties' traits as well as support for new types of social organizations could be provided by a development project or local agricultural technician.

Production systems without commodification are already occurring, as evidenced in the range of informal exchanges described by farmers in this project, where exchange-value is relational and negotiated between the two individuals involved in the exchange. These seed systems seem to build from social certification, as described by Sperling and McGuire (2010). Rather than engaging with the formal certification system and all of the monetary costs associated with it, socially certified seed producers can invest time and resources in their seed production and sell or exchange the seeds at a premium with people who trust their reputation and shared history as assurance of the quality of the seed. This alternative has been discussed but not yet widely explored by mainstream development practitioners, and should also be seen in some ways as simply an extension and adjustment of community or group-level reproductive capabilities (see Thiele, 1999, for discussion of social certification in the Andes).

Recognizing that seed systems based on production (where the production and use of the seed is separate) do not necessarily lead solely to complete commodification is an important step toward building alternatives to the conventional formal seed systems being pursued by development agencies and national governments. Future quantitative analysis in this project aims to further identify which type of seed system is most appropriate for and accessible to which types of individual farmers. By including both the conventional system as well as a range of alternatives, no single approach to seed diffusion and access is privileged or assumed to be monolithically superior. The seed systems being developed by farmers in West Africa are sophisticated and intentional, and are a manifestation of the skilling (Stone, 2004) that farmers accumulate as improved variety seeds become increasingly familiar and available. Identifying the fundamental value that people place on improved variety seeds as well as the range of types of exchange decisions that are possible and appropriate for a range of individuals reinforces the point that no single seed system will facilitate access for all individuals. Instead, understanding seeds as a confluence of social, economic and natural interpretations of use and value reinforces the imperative to explore and support alternative seed systems that reflect the particularities of place and people.

## References

AGRA, 2012a. AGRA's Strategy for an African Green Revolution: Who We Are. Alliance for a Green Revolution in Africa. Retrieved April 22, 2013 from http://www.agra.org/AGRA/en/who-we-are/-strategy--for-an-african-green-revolution/.

AGRA, 2012b. AGRA Programs: What We Do. Alliance for a Green Revolution in Africa. Retrieved April 22, 2013 from http://www.agra.org/what-we-do/agra-programs/.

Alene, A., Yigezu, Y., Ndjeunga, J., Labarta, R., Andrade, R., Diagne, A., Muthoni, R., Simtowe, F., Walker, T., 2011. Measuring the effectiveness of agricultural R&D in sub-Saharan Africa from the perspectives of the varietal output and adoption. Paper presented at ASTI-IFPRI/FARA Conference, Accra, Ghana.

Almekinders, C., Louwaars, N., 1999. Farmers' Seed Production: New Approaches and Practices. Intermediate Technology Publications, London.

Almekinders, C., Louwaars, N., de Bruijn, G.H., 1994. Local seed systems and their importance for an improved seed supply in developing countries. Euphytica 78 (3), 207-216.

Badstue, A.L.B., Hellin, J., Berthaud, J., 2012. Re-orienting participatory plant breeding for wider impact. African Journal of Agricultural Research 7 (4), 523-533.

Bellon, M., Anderson, C.L., Lipper, L., Dalton, T., Keleman, A., Grum, M., 2010. Synthesis: Markets, seed systems and crop diversity. In: Lipper, L., Dalton, T., Anderson, C.L. (Eds.) Seed Trade in Rural Markets: Implications for Crop Diversity and Rural Development. Earthscan, Sterling, VA, pp. 189-208.

Bentley, J.W., Van Mele, P., Reece, J.D., 2011. How seed works. In: Van Mele, P., Bentley, J.W., Guéi, R.G. (Eds.) African Seed Enterprises: Sowing the Seeds of Food Security. CAB International, Wallingford, UK, pp. 8-24.

Biernacki, P., Waldorf, D., 1981. Snowball sampling: Problems and techniques of chain referral sampling. Sociological Methods and Research 10 (1), 141-163.

Blaikie, P., 1981. The Political Economy of Soil Erosion in Developing Countries. John Wiley & Sons, New York.

Busch, L., 2010. Can fairy tales come true? The surprising story of neoliberalism and world agriculture. Sociologia Ruralis 50 (4), 331-351.

Ceccarelli, S., Grando, S., 2007. Decentralized-participatory plant breeding: An example of demand-driven research. Euphytica 155 (3), 349-360.

Coulibaly, H., Bazile, D., Sidibé, A., Abrami, G., 2008. Seed supply systems of pearl millet and sorghum in Mali: Production, diffusion and conservation of varieties. Cahiers Agricultures 17 (2), 199-202.

Dalohoun, D., Van Mele, P., Weltzien, E., Diallo, D., Guindo, H., Vom Brocke, K., 2011. Mali: When government gives entrepreneurs room to grow. In: Van Mele, P., Bentley, J.W., Guéi, R.G. (Eds.) African Seed Enterprises: Sowing the seeds of food security. FAO, Rome, pp. 65-87.

Das, R., 2002. The Green Revolution and poverty: A theoretical and empirical examination of the relation between technology and society. Geoforum 33(1), 55-72.

de Janvry, A., 1981. The Agrarian Question and Reformism in Latin America. Johns Hopkins University Press, Baltimore.

Diakité, L., Sidibé, A., Smale, M., Grum, M., 2008. Seed value chains for sorghum and millet in Mali: A state-based system in transition. International Food Policy Research Institute: Discussion Paper Series No. 749. IFPRI, Washington, D.C.

Evenson, R.E., Gollin, D., 2003. Assessing the impact of the Green Revolution. Science 300 (5620), 758-762.

FAOSTAT, 2010. Agricultural production. Food and Agriculture Organization of the United Nations. Retrieved June 5, 2012 from http://faostat.fao.org/site/339/default.aspx.

Flora, C.B., Flora, J.L., 1989. An historical perspective on institutional transfer. In: Compton, J.L. (Ed.) The Transformation of International Agricultural Research & Development. Lynne Rienner Publishers, Boulder, CO, pp. 7-32.

Gibson-Graham, J.K., 2006. A Postcapitalist Politics. University of Minnesota Press, Minneapolis.

Hart, K., 2006. Bureaucratic form and the informal economy. In: Guha-Kahsnobis, B., Kanbur, R., Ostrom, E. (Eds.) Linking the Formal and Informal Economy. Oxford University Press, Oxford, pp. 21-35.

INSAH, 2009. Regulation c/reg.4/05/2008 on the Harmonization of Rules Governing Quality Control, Certification and Marketing of Plant Seeds and Seedlings in the ECOWAS region. Institute du Sahel, Bamako, Mali.

Kaba, A.J., 2005. The spread of Christianity and Islam in Africa: A survey and analysis of the numbers and percentages of Christians, Muslims and those who practice indigenous religions. The Western Journal of Black Studies 29 (2), 553-570.

Kloppenburg, J., 2004. First the Seed: The Political Economy of Plant Biotechnology (2nd ed.). Cambridge University Press, New York.

Lipper, L., Dalton, T., Anderson, C.L., Keleman, A., 2010. Agricultural markets and the sustainable use of crop genetic resources. In: Lipper, L., Anderson, C.L,, Dalton, T. (Eds.) Seed Trade in Rural Markets: Implications for Crop Diversity and Agricultural Development. Earthscan, Sterling, VA, pp. 3-14.

Louwaars, N., de Boef, W.S., 2012. Integrated seed sector development in Africa: A conceptual framework for creating coherence between practices, programs, and policies. Journal of Crop Improvement 26 (1), 39-59.

Marx, K., 1977. The Grundrisse. In: R.C. Tucker (Ed.) The Marx-Engels Reader (2nd ed.). W.W. Norton & Company, New York, pp. 221-293.

Okali, C., Sumberg, J., Farrington, J., 1994. Farmer Participatory Research: Rhetoric and Reality. Intermediate Technology Publications, London.

Polanyi, K., 1957. The economy as instituted process. In: Polanyi, K., Arensberg, C.M., Pearson, H.W. (Eds.) Trade and Market in the Early Empires: Economies in History and Theory. The Free Press, Glencoe, IL, pp. 243-269.

Richards, P., de Bruin-Hoekzema, M., Hughes, S., Kudadjie-Freeman, C., Kwame Offei, S., Struik, P., Zannou, A., 2009. Seed systems for African food security: Linking molecular genetic analysis and cultivator knowledge in West Africa. International Journal of Technology Management 45 (1/2), 198-214.

Scoones, I., Thompson, J., 2011. The politics of seed in Africa's Green Revolution: Alternative narratives and competing pathways. Institute of Development Studies Bulletin 42 (4), 1-23.

Shiva, V., 1995. Biotechnological development and the conservation of biotechnology. In: V. Shiva, I. Moser (Eds.) Biopolitics. Zed Books, London, pp. 193-213.

Siart, S., 2006. Strengthening Local Seed Systems: Options for Enhancing Diffusion of Varietal Diversity of Sorghum in Southern Mali. Doctoral dissertation. University of Hohenheim, Hohenheim, Germany.

Smale, M., Dembélé, B., Traoré, I.S., Guindo, O., Konta, B., 2008. Trading millet and sorghum genetic resources: Women vendors in the village fairs of San and Douentza, Mali. International Food Policy Research Institute: Discussion Paper Series No. 746. IFPRI, Washington, D.C.

Sperling, L. and McGuire, S., 2010. Understanding and strengthening informal seed markets. Experimental Agriculture 46 (2), 119-136.

Stone, G.D., 2004. Biotechnology and the political ecology of information in India. Human Organization 63 (2), 127-140.

Stone, G.D., 2007. Agricultural deskilling and the spread of genetically modified cotton in Warangal. Current Anthropology 48 (1), 67-103.

SWAC/OECD, 2010. Ecological zones in West Africa. The Organization for Economic Co-operation and Development, Sahel and West Africa Club. Retrieved Mar. 2, 2010, from http://www.oecd.org/document/63/0,3343,en_38233741_38246685_38265151_1_1_1_1,00.html.

Thiele, G., 1999. Informal potato seed systems in the Andes: Why are they important and what should we do with them? World Development 27 (1), 83-99.

Temple, B., Young, A., 2004. Qualitative research and translation dilemmas. Qualitative Research 4 (2), 161-178.

Toenniessen, G., Akinwumi, A., DeVries, J., 2008. Building an Alliance for a Green Revolution in Africa. Annals of the New York Academy of Sciences 1136, 233-242.

Tripp, R., 2001. Seed Provision & Agricultural Development. Overseas Development Institute, London.

USAID, 2012. Agriculture and Food Security Program: Expanding and Enhancing Agricultural Markets and Trade. United State Agency for International Development. Retrieved February 7, 2013 from http://www.usaid.gov/what-we-do/agriculture-and-food-security/expanding-and-enhancing-agricultural-markets-and-trade.

Welsh, R., Glenna, L.L., 2006. Considering the role of the university in conducting research on agri-biotechnologies. Social Studies of Science 36 (6), 929-942.

Vayda, A.P., Walters, B.B., 1999. Against political ecology. Human Ecology 27 (1), 167-179.

Yapa, L., 1996. Improved seeds and constructed scarcity. In: Peet, R., Watts, M. (Eds.) Liberation Ecologies: Environment, Development, Social Movements. Routledge, New York, pp. 69-85.

Zimmerer, K., 1996. Changing Fortunes. University of California Press, Berkeley.

Food Sovereignty:
A Critical Dialogue

INTERNATIONAL CONFERENCE
YALE UNIVERSITY
SEPTEMBER 14-15, 2013


http://www.yale.edu/agrarianstudies/foodsovereignty/index.html

# FOOD SOVEREIGNTY: A CRITICAL DIALOGUE INTERNATIONAL CONFERENCE PAPER SERIES

A fundamentally contested concept, food sovereignty has — as a political project and campaign, an alternative, a social movement, and an analytical framework — barged into global agrarian discourse over the last two decades. Since then, it has inspired and mobilized diverse publics: workers, scholars and public intellectuals, farmers and peasant movements, NGOs and human rights activists in the North and global South. The term has become a challenging subject for social science research, and has been interpreted and reinterpreted in a variety of ways by various groups and individuals. Indeed, it is a concept that is broadly defined as the right of peoples to democratically control or determine the shape of their food system, and to produce sufficient and healthy food in culturally appropriate and ecologically sustainable ways in and near their territory. As such it spans issues such as food politics, agroecology, land reform, biofuels, genetically modified organisms (GMOs), urban gardening, the patenting of life forms, labor migration, the feeding of volatile cities, ecological sustainability, and subsistence rights.

Sponsored by the Program in Agrarian Studies at Yale University and the Journal of Peasant Studies, and co-organized by Food First, Initiatives in Critical Agrarian Studies (ICAS) and the International Institute of Social Studies (ISS) in The Hague, as well as the Amsterdam-based Transnational Institute (TNI), the conference "Food Sovereignty: A Critical Dialogue" will be held at Yale University on September 14–15, 2013. The event will bring together leading scholars and political activists who are advocates of and sympathetic to the idea of food sovereignty, as well as those who are skeptical to the concept of food sovereignty to foster a critical and productive dialogue on the issue. The purpose of the meeting is to examine what food sovereignty might mean, how it might be variously construed, and what policies (e.g. of land use, commodity policy, and food subsidies) it implies. Moreover, such a dialogue aims at exploring whether the subject of food sovereignty has an "intellectual future" in critical agrarian studies and, if so, on what terms.

## ABOUT THE AUTHOR

Kristal Jones is a Ph.D. candidate in Rural Sociology at the Pennsylvania State University. She has long-standing ties to Sahelian West Africa, and has worked on a variety of research projects focused on the differentiated effects of agricultural research and development projects in that region. She is currently working on an analysis of adaptive seed systems with the introduction of improved varieties of sorghum and pearl millet.