



Exploring linkages between agricultural sectors and agroecological practices: how cash crop-led development affects small-scale irrigated dry season production

Brian Dowd-Uribe*, Carla Roncoli and Ben Orlove | *University for Peace, P.O. Box 138-6100, San José, Costa Rica



Introduction
This research asks:
- What accounts for the use of modern and chemical practices in dry season vegetable production in southwestern Burkina Faso?
We adopt a historical analysis to understand how decades of cotton-led development influence current production practices among dry season vegetable producers (see Figure 1).


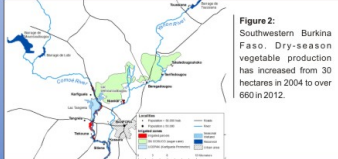


Figure 1: Dry season vegetable producer in his hot pepper field.

Methods and Research Setting
The study draws on contextual knowledge since the research team started working in Burkina Faso in the mid-1990s and in the research site in 2007. Specifically we draw from interviews and surveys of 137 producers and experts conducted from 2011-2014 in the Upper Comoé sub-basin. (see Figure 2)
This area was chosen for this research due to
(a) the explosion of dry season vegetable production and
(b) its national identity as a breadbasket for food deficit areas



Results
Historical developments help to explain chemical production practices among dry season vegetable producers in the study area.

- 1) Small-holder driven cotton production meant small farms were the sites for agricultural modernization efforts.**
Cotton was the driver of national development in Burkina Faso since the 19th century. Colonial administrators relied on smallholder farmers to improve cotton exports, instead of pursuing strategies to increase cotton production via European-run plantations. Thus smallholder farms were the sites of agricultural modernization efforts in French West Africa (Roberts 1996).
- 2) Desire for uniform cotton quality led to the destruction of traditional seed varieties reducing crop diversity and seed saving.**
Cotton has been grown in West Africa since at least the 11th century. Seed saving ended in the mid-20th century when the French colonial cotton company destroyed traditional varieties (Bassett 2001). This led to an elimination of cotton crop diversity, and birthed the annual purchase of new and improved seeds.
- 3) State-led monopoly control of the cotton sector offered access to inputs and improved seeds via credit reducing soil conservation efforts.**
Burkinabè cotton companies retained a monopoly on the purchase and sale of cotton allowing for inputs and improved seeds to be widely available to smallholder producers greatly increasing their use (Dowd-Urbe 2014).
- 4) Historic dependence on improved seeds and inputs is visible in dry season vegetable production**
Our observations of dry season vegetable production demonstrate:
 - a) limited seed saving**
- improved seeds from Europe are purchased each growing season, even for traditional African crops such as okra (see Figure 3)
 - b) dependence on chemical inputs limiting non-chemical soil conservation**
- most producers use chemical herbicides, fertilizers and (often cotton) pesticides on their vegetable crops. There is limited use of non-chemical pest protection or soil conservation strategies (e.g. composting, cover-cropping, crop rotation) (see Figure 4).
- 5) The promotion of agroecological techniques can be improved by integrating historical developments.**
Smallholder-led agricultural modernization has resulted in the loss of certain skills and techniques. To address this we recommend:
 - Knowledge-building activities to (re)introduce agroecological skills
 - Tailoring specific techniques to the social and agroecological context of production.

Conclusions
An appreciation for historical development patterns in Burkina Faso helps to identify why certain agricultural practices are prevalent (e.g. purchase of improved seeds) and others are less prevalent (e.g. soil conservation strategies).
The historical dimensions of agricultural development can be used to inform contemporary attempts to promote agroecology. Knowledge-based interventions to rebuild seed saving strategies and soil conservation techniques are needed.

Literature cited

Bassett, T. J. (2001). The Peasant Cotton: Revolution in West Africa. Cambridge: Cambridge University Press
Dowd-Urbe, B. (2014). Liberalisation Failed: Understanding Persistent State

Power in the Burkinabè Cotton Sector from 1990 to 2004. Development Policy Review, 32(5), 545-566.

Roberts, R. L. (1996). Two worlds of cotton: Colonialism and the regional economy in the French Sudan, 1800-1946. Stanford University Press.



Acknowledgements:
Major funding was provided under the cooperative agreement NSF SES-0951516 awarded to the Center for Research on Environmental Decisions at Columbia University. The structure of this poster is based on a template developed by Colin Purrington. We thank our institutional collaborators in Burkina Faso:

- Director General Ali Jacques Garani and Ms. Judith Sanfo of the General Directorate of Meteorology
- Mrs. Jacqueline Zougrana of the General Directorate of Water Resources, and
- Dr. Leopold Somé of the Institute of Environmental and Agricultural Research
- Moussa Sanon of the Millennium Challenge Corporation