

“Conservation Agriculture in Lesotho: The Drivers of Adoption and the Role of Extension”

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Background

Recent efforts by the Government of Lesotho, non-government organizations (NGOs), and international attention have focused on developing conservation agriculture (CA) practices adapted to the cultural, economic, and agro-ecological conditions. In particular, understanding the influence of the introduction of CA technologies on soil erosion, yields, labor allocation and gender roles is of critical importance for developing sustainable agriculture technologies. This research is a collaborative effort between The National University of Lesotho and The University of Tennessee.



Plowing on highly erosive areas create “Dongas”, which lead to soil loss and lower agricultural production.

Research Objective

To examine the demographic characteristics of CA adopters and non-adopters

Main Tenets of CA

- 1) minimizing soil disturbance,
- 2) maintaining residue on soil surface and
- 3) mixing/rotating crops



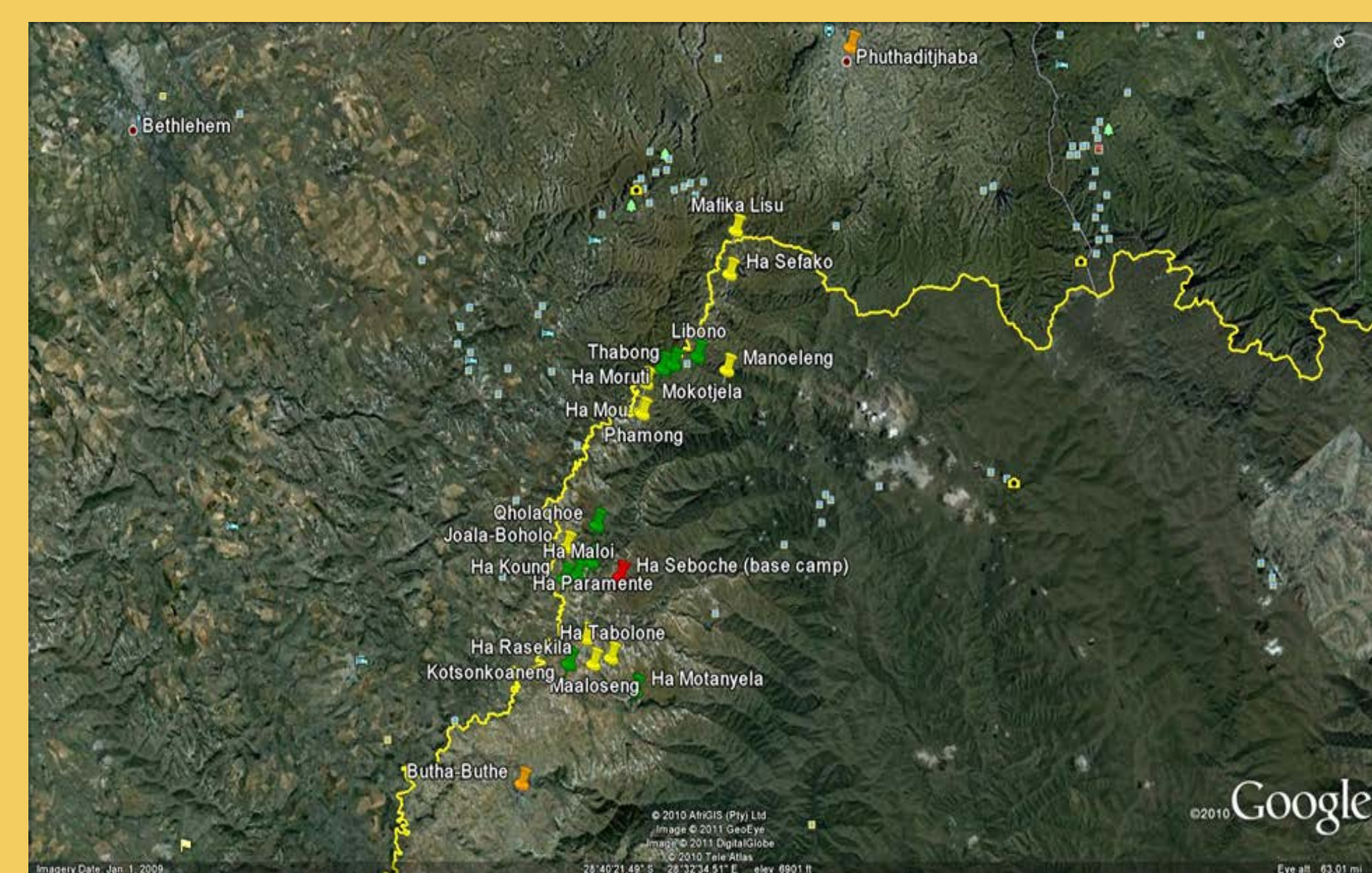
Likoti is the most common entry point to CA in Lesotho. The method involves digging potholes that are approximately 20cm across and 15cm deep in a 75x75cm grid-like pattern. Seeds are directly planted in to the pothole (typically 1 to 3 seeds depending on the targeted plant population) along with some source of additional nutrients (inorganic or organic fertilizer).

Data

This research uses household survey data from more than 430 households in ten Botha Bothe district villages in Lesotho, where likoti and mechanized CA has been introduced by non-governmental organizations and Extension, respectively.

Three key information sources were used to increase the precision of the sample (1) population Census data; (2) the importance of agriculture in terms of employment and subsistence; and (3) information about ongoing CA Extension efforts in the Botha Bothe district.

The survey instrument consisted of fourteen pages and included questions regarding: household demographics, assets, income and consumption; farm management and agricultural production/marketing 2010/2011; rural services and credit; knowledge and attitudes associated with agriculture and social networks. The survey was designed to take up to one hour to complete per respondent. Sample size was determined using a 95% confidence interval, a 5% margin of error.



Key: yellow, randomly selected villages included in list frame; green, villages in list frame but not selected. The provincial capital, Buthe-Buthe, and a significant marketing point in South Africa (Phuthaditjhaba) are marked in orange. Other villages and towns are indicated by the squares. The survey base camp, Seboche, is indicated by the red pin. The South African-Lesotho border is outlined by the yellow line.



Maruthelane Rantsoabe surveying farmer in Manoeleng (with hillside farms in the distance)

Lefisa Thibello climbing to interview households in Ha Sefako

Table 1 : Demographic Variables Associated with Head of Household by CA Adoption Status.

Item	Non-Adopter	CA Full Time	CA New	CA Abandon
Description of CA Adoption	Farmers who have not practiced any form of CA in the last two years	Farmers practicing CA on at least one field over the last two years	Farmers using CA for the first time	Farmers who used CA but now only use conventional
Sample (% of 433)	342 (79%)	49 (11.3%)	33 (7.6%)	9 (2.1%)
Mean Household Size (Std Dev)	5 (3.0)	6 (3.0)	5 (2.7)	4 (1.9)
Mean Head of Household (HH) Age (Std Dev)	53 (16.5)	54 (13.6)	54 (15.5)	57 (9.7)
HH Sex Female	35.2%	32.7%	21.9%	44.4%
HH Married	45.9%	46.9%	42.2%	44.4%
Mean Years Making Farm Decisions (Std Dev)	21 (17.0)	18 (13.6)	20 (16.4)	16 (12.2)
Some Primary School	68.9%	62.5%	74.2%	77.8%
Some High School	12.6%	16.7%	6.5%	22.2%

Table 2: Source of Training by CA Adoption Status

CA STATUS	Non-Adopter Mean (std dev)	CA Full Time Mean (std dev)	CA New Mean (std dev)	CA Abandon Mean (std dev)
Source of Training				
Sample size	340	49	33	9
Agricultural Training	39%	76%	76%	78%
Trained through Government Extension	12%	20%	27%	56%
Trained by NGO	11%	47%	30%	22%

Results

Adoption of CA (see Table 1)

• Farmers were grouped into four categories: non-adopters (79%), adopters (11%), recent adopters (8%), and abandoners (2%). Use of mechanized CA, as promoted by the government, was limited and more likely to be abandoned.

Household Demographics (see Table 1)

- On average, the largest households (6 members) were more likely to practice CA while small households (4 members, often with an older, unmarried/widowed female head) were more likely to abandon CA.
- Years of making farming decisions does not appear to affect the adoption of CA. However, in terms of the education level of household head, CA adopters had relatively more education than those that had not adopted.
- Composition of the household, especially in terms of marital status and sex of household head, may play a role in adoption but ambiguous results necessitate more detailed analysis of labor allocation.

Household Production and Consumption of Staples

- Maize was the primary food crop for 93% of CA farmers and crop mix was often limited to two summer crops. Crop rotation, a key element of CA, is uncommon and many farmers chose not to plant a winter crop, be it for cover or other purposes.
- ‘Full time’ CA farmers depended heavily on their own maize, indicating some self-sufficiency. Conversely, their relatively high dependence on food aid shows that food insecure households may be more willing to adopt CA in an effort to promote food security in the medium/long run and to mitigate risks associated with reliance on their own production.

Sources of Income

- CA farmers earned income from working for other farmers, crop sales, brewing and off farm employment. ‘Full time’ CA farmers depended the least on salaried non-agriculture positions and remittances relative to the other categories of farmers. Agriculture matters more to CA farmers.

The Role of Extension (see Table 2)

- About 39% of non-adopters had received agricultural training, some potentially in CA, and may constitute ‘early adopt/early abandon’ that took place prior to the 2010/11 season’. 78% of farmers that had recently abandoned CA, had received formal training.
- ~25 % of farmers currently engaged in CA (“full time” or “new”) had not received training, which provides some evidence of diffusion of the CA methodology amongst farmers.

Conclusions and Future Directions

CA Adopters are:

More dependent on own production for food, employment and income. They are relatively well educated, grow a broader mix of staples and more dependent on food aid.

Opportunities and Challenges abound:

- Need to disseminate evidence of increased yields, mitigated effects of drought/flood, enhanced soil fertility and weed suppression.
- Scaling-up needs to be addressed in the face of missing markets for inputs and outputs and a general hesitation to move beyond small-scale plots.
- Research based on experimental plots needs to be taken on-farm in an effort to prove and disseminate technology.

For more information or for copy of a conference paper on this subject, please contact:

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