Pitfalls to Avoid and Lessons Learnt for Conservation Agriculture Sustainable Adoption

Ruwona Erick
National Food Security Coordinator, Christian Care
27 St Patrick’s Road, Hatfield,
Harare, Zimbabwe
eruwona@ccare.co.zw; ruwonaerick@gmail.com
| Mobile: +263 772 310 392|

Keywords: CA adoption, Farmer to Farmer Training and Extension, Conservation Agriculture, Lead Farmer Approach, Participatory Extension Approaches

Background
Conservation agriculture (CA) has been promoted in southern Africa since the late 1990s with the aim of reversing the effects of declining soil fertility and productivity on current farming systems as well as adapting to projected increase in climate variability and change (Thierfelder et al., 2014). It is based on three interlinked principles: a) minimum soil disturbance; b) surface crop residue retention and c) crop rotations and mixing (FAO, 2012). Although these technologies have been widely promoted in Southern Africa, adoption rates are low and often partial, the benefits for farmers remain highly debated and impacts seem to be context-specific (Baudron, et al, 2012; Arslan et al, 2013) Proponents of the technology argue that the whole system has to be adopted simultaneously for farmers to capture the synergies and full benefits [Gowing and Palmer 2008; Guto et al., 2011]. This implies that it is relatively unprofitable for farmers to adopt only one or part of the technology option. For example in Zambia and Zimbabwe, the few farmers that have adopted CA technologies tend to do it partially, either practicing some components or adopting CA on some plots but inconsistently (Umar, 2013; Mazvimavi and Twomlow, 2009). Use of mulch and adoptions of rotations and crop mixing are neglected the most by those who adopt. Partial adoption of CA has been observed by some as a step toward full adoption in some cases. Some adopt enough to facilitate access to free inputs.

Results
Research evidence from the region shows that CA maintains high levels of water infiltration thereby increasing the available soil moisture (Thierfelder and Wall, 2009). However, the adoption of CA is often constrained by numerous factors as a result of the diversified and complex farming systems and the socio-economic circumstances. These include lack access to critical inputs, high cost of labour for weed control, mulch gathering challenge, lack of access to viable markets, competition for crop residues in mixed crop-livestock systems, and finally the mindset of farmers that agriculture is only possible and adequate if the soil is tilled (Christian Care 2010., Thierfelder et al., 2014). The question of labour has reduced farmer adoption, farmers capacity to increase the plot sizes and reduced time invested on CA. (Christian Care 2010:15) The cost of labour required to address weed proliferation (such as mulch gathering) is often beyond the reach of many farmers (Nyamangara et al., 2013). The FAO defines mulch as “material which is applied to the soil surface in order to reduce water loss, suppress weeds, reduce fruit splashing, modify soil temperatures and generally improve crop productivity”. Most CA extension in semi-arid zones of Zimbabwe do not emphasize the mulch role in weed suppression other do not promote it at all on the assumption that farmers will not get it or its use will result in an unhealthy competition between CA and livestock. They focus on water loss and moderating soil temperatures (Ndah et al., 2013) and promote 30% coverage of mulch as adequate. The farmers who are producing more than they require for their own consumption have challenges in accessing a viable market to sell their produce. (Christian Care 2010)

Application and Implication for CA
The major challenges to dry land crop production in Zimbabwe are moisture (due to erratic rains and prolonged mid season dry spells) and soil fertility. Prevailing soil fertility options depend on external and
expensive inputs. Locally available and sustainable resources provide an answer to the challenges which small holder farmers face. Promotion of mulch, organic manure and seed production and banking has provided sustainability to grain production. Labour and soil fertility are a major challenge to expansion and green manure cover crop is now being promoted to deal with it. Market linkages are required for such farmers who now produce more than they require.

**Experimental Approach**

Christian Care has implemented CA projects with support from Christian Aid since 2004 and the United Church of Canada and Canadian Foodgrains Bank since 2006. The methodological approaches applied in the promotion and cascading of CA by Christian Care included training of government agricultural extension staff on the principles of CA. This involved conducting baseline surveys to identify current smallholder farming practices and information gaps with regard to cereal production. Identification and selection of potential farmers with requisite capacity, primarily labour to adopt and adapt the technology was done in a participatory manner with some joining on voluntary basis. During the initial stages of CA promotion smaller plot sizes (30mx20m) were promoted. Later larger plot sizes (50mx50m) were promoted after realizing that they would produce enough cereal to meet annual grain requirement for a house hold of six members. Widows and smaller families practiced on smaller pieces of land enough to meet their requirements. Yield per unit area and total production comparisons between CA plot and conventional plots were done. Establishing farmer clusters of between 4 and 10 farmers per cluster to facilitate farmer-to-farmer extension was key. This approach has allowed for greater adoption of CA since it allows for cross-learning and also close monitoring of the cluster farmers by the lead farmers. Training at least one high potential lead farmer per cluster so as to train other farmers and provide technical backstopping. Initial focus was on the resource constrained farmers. Later deliberate efforts were made to select successful and popular farmers who also doubled as community opinion leaders in order to facilitate buy-in and voluntary adoption of CA practices by other farmers within the community. This led to a constant increase in the number of farmers adopting CA. CA promotion has now been diversified to include water harvesting technologies such as pit traps, Phiri pits, dead level contour ridges and pot holing.

**Results and Discussion**

The evaluation of Christian Care programming (2011) established results which are summarised below. It established that minimal tillage was universally adopted by CA farmers, permanent soil coverage/mulch was adopted by 83% of those evaluated. Crop rotation was adopted almost universally in Chirumhanzu 100% where seed was provided, and practically not at all in Nkayi where it was not part of the project design (Christian Care Evaluation 2011). Maize yields increased dramatically under CA, averaging between 2.9 and 3.9 MT/ha during the last cropping season, while conventional yields averaged between 0.5 and 0.7 MT/ha (Christian Care Evaluation 2011). Improved maize yields increased the amount of food available at the household level. In addition, increased income levels from surplus production allowed project participants to send children to school, buy livestock and purchase supplies such as cooking oil and sugar. The majority of CA farmers, especially women, felt that maize production using CA was less labour intensive per unit of production. In Nkayi, approximately 15% of the households were trained in CA, and now approximately 50% of the households practice CA (Christian Care Evaluation 2011). Adoption was enhanced by working closely with government agriculture extension agents and coordinating with other institutions. Critical issues facing continued adoption of CA include sufficient procurement of mulch or production of mulch in situ (Green Mulch) and plant nutrients (both organic and inorganic forms), clarifying actual labour demands and promotion of CA for crops other than maize. Farmers took time to increase dramatically on the plot sizes. 80% of the respondents confirmed increasing their plot size in the 5th year of the project. There has been a rapid up-scaling of the number of farmers practicing CA in both of the districts evaluated, and this is a clear indicator of sustainability of the program. Chirumhanzu district Year 1 - 240 farmers, Year 2 - 480 farmers, Year 3 – 720, Year 4 - 1086, Year 5 – 1014, Year 6 – 1265. CA has not been abandoned even after exit in certain wards as farmers have continued to practice it and extend their plots without external support.
References


