

SIMLESA Final Review

DRAFT Major Findings and Recommendations

Brian Keating and Mandi Rukuni

Note: Recommendations are specific as to whether we see the issue as one for Phase 2 completion or one that can inform future program evolution.

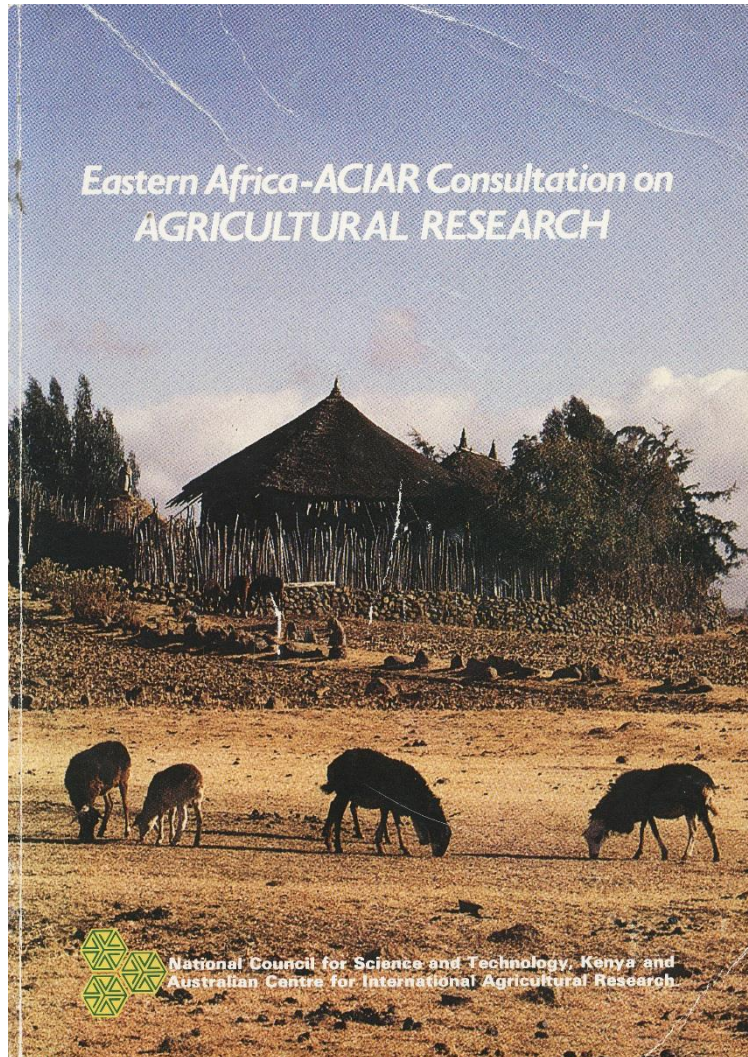
There will be other recommendations on more operational issues, including some MTR 2015 follow-up issues.

SIMLESA Final Review

The bottom line

- No reasonable person who understands the context of AR4D in SSA could deny anything other than SIMLESA has been an outstanding success.
- That is not to say the job is done and there have not been pitfalls and lessons learnt along the way. It is also not to say there have not been some gaps and missed opportunities.

8 years of SIMLESA builds on a longer history



The sustainable intensification journey for African small-holder farming has no defined starting date but ACIAR's interest in this topic can be precisely dated to 1983 when they ran their first consultations in eastern and western Africa on dryland farming systems research needs.

Over the last 35 years there has always been some ACIAR support for what we now called sustainable intensification somewhere in eastern or southern Africa.

Key features that have enabled success include;

- Broad geographic foundation and good design of high and medium potential geographies
- Cross – border cooperation and co-learning
- Multidisciplinary / systems approaches including modelling tools
- Economists, sociologists, anthropologists, agronomists, breeders working to common objectives
- Committed and energetic program leadership
- Collaborations with Australian partners - both in specialised areas such as systems modelling and in on-the ground agronomy with embedded appointees
- Governance structures that build ownership (country leaders, PSC etc)
- Leverage off a wider program of work in CGIAR (such as varietal improvement)
- Stability of funding – 8 years of significant support has been critical
- A continuing commitment to multiple forms of capacity building
- A commendable culture and track record of peer reviewed scientific publication

The socio-economic context (Obj. 1)

- **Finding: SIMLESA socio-economic research has generated broad-based and novel insights into the state of farming systems, the technology adoption landscape and the human dimensions of small-holder farming.**
 - The Review Team notes the impressive body of data gathered by the socio-economic team under Objective 1, both within SIMLESA and the sister project Adoption Pathways. The scientific publication effort has been highly commendable. These outputs are dominated by advanced econometric approaches that make it difficult for non-specialist audiences to gain much insight into the farming systems behind the data. We feel that the econometric approaches could be complemented by more qualitative synthesis that brings together agronomic, economic, social and anthropological perspectives and informs a range of stakeholders? Such outputs could also seek to take the insights from the five countries and multiple regions within countries and place them a broader context of spillover countries and ESA.
 - In other recommendations from this Review, we have highlighted the significance of market and institutional settings to the prospects for adoption of SIMLESA outputs. Given this significance, we would argue that the baseline and longitudinal socio-economic data collections should have placed more emphasis on such market and institutional settings at regional and national scale.
- **Recommendation: As part of the Phase 2 completion, SIMLESA should prepare for key audiences (policymakers, research investors, extension) synthesis outputs that draw upon the multi-disciplinary capabilities and help support the scaling out strategy.**

The technology options (Obj. 2)

- **Finding: SIMLESA agronomic research has developed / demonstrated a set of technologies and practices that (generally) offer (if adopted) significant increases in yield with reduced downside risk and sustainability and labour saving benefits. The options are not completely novel but the combinations and scale at which these have been investigated on-station and on farm is unique and of great significance.**
 - The Review Team were impressed with the on-farm and on-station experimentation and note the transfer of this data to Dataverse is well advanced. We are unaware of any on-farm data collection on SI options that can match the scale and scope of this effort. It is a unique resource and the SIMLESA team have a responsibility to extract the maximum insights possible. We see this can be done via a set of synthesis products that summarise the data and enable it to be used in a predictive way. This could involve aligning results to some mechanism of agro-ecological characterisation. It could also involve combining the measured data with some crop modelling activity to aid in extrapolation in time and space. Developing recommendation domains for specific SI technologies and practices might be a useful practical application of this synthesis activity.
- **Recommendation: As part of the completion of Phase 2, a series of synthesis products should be developed that ensure full returns and legacy for the very significant investment in agronomic data collection. Such products should target defined audiences (including science, government, extension, business), draw together lessons within countries, amongst SIMLESA countries with possible spillovers to the ESA region and where appropriate link the measurement data to some supportive modelling elaboration.**

Adoption progress and likelihood (Obj. 1)

- **Finding:** Some good adoption progress is apparent but further clarity is needed as a number of factors obscure the interpretation of adoption data. These include lumping diverse technologies into a binary “adopt or not” measure and multiple versions of the adoption achievement (Country level, Obj 1 level, MEL, Ex ante) circulating.
 - The Review Team was convinced that some adoption was achieved but we remain uncertain on exactly how extensive that was and what specific technologies were being adopted. Indications were that improved varieties, intercroops, rotations and fertilisers were most readily adopted followed by reduced tillage in some specific agro-ecologies. Residue retention more generally problematic but some adoption particularly in circumstances where livestock are managed or absent. We remain uncertain how high the thresholds were to consider a technology adopted. To illustrate, intercroops have been widespread in small-holder farming systems for a very long time and we are uncertain whether such intercroops would qualify as a technology adopted.
 - The fact that binary variables(adopt or not) are being applied to a very diverse set of technologies also adds to our concerns. We also feel more clarity is needed on the extent of autonomous adoption and spread as distinct from adoption arising from a direct intervention such as provision of inputs. We suggest that novel approaches to estimating adoption progress might be possible by combining the on-farm surveys of management practices with the systems modelling capabilities. Such approach could estimate an integrated adoption index (0-100%) along the lines of a “whole-farm yield gap closure” measure.
- **Recommendation:** Within Phase 2 wrap-up, it is critical that an integrated SIMLESA view of adoption progress is developed that will be robust in the face of scientific and investor critique.
 - Because of the diversity of technologies and practices under consideration, adoption data should be disaggregated for individual technologies.
 - Novel measures of adoption (such as the whole farm yield gap closure metric) aided by modelling should be explored beyond Phase2.
 - The component of adoption that is autonomous should be identified.

Needs/opportunities for continued pursuit of technological investigation (Obj. 2)

Finding: There remains a continuing need for technological investigation, in particular;

- **Production, management and utilization of forages/residues in integrated crop-livestock systems,**
- **Approaches to dealing with emerging weeds, pests and disease issues,**
- **Monitoring of long-term benefits for soil health,**
- **Targeted investigations of the greenhouse gas emissions, carbon sequestration prospects and adaptation options in the face of climate change.**

The Review Team was impressed by the extensive experimental program implemented to date. While we see adoption and scale-out issues as a priority to maximise the benefits from this investment, we do not think it would be wise for the technical biophysical studies to cease. Have, for instance all the possible innovative approaches to generating forages/residues for crop management and livestock fodder been fully exhausted? An extensive body of ACIAR supported work in Australia and Kenya during the 1980's is relevant and does not appear to have been fully utilized. We also recognise many of the sustainability benefits are long term and will need continuing experimental investment for full assessment. We saw some evidence of reduced tillage being used on soils without residue cover. There are significant downside risks of soil surface structure degradation in such situations and that risk should be actively avoided.

The technologies and practices proposed should be generally net positive from a Climate Smart Agriculture (CSA) perspective. However, investors in such benefits will want to see robust evidence and this could be pursued if appropriate funding partners could be secured.

Recommendation: Beyond Phase 2, the SIMLESA team explore opportunities to further develop;

- **Novel forage/residue options and tillage systems for crop-livestock systems**
- **Maintenance of long-term experimental sites and monitoring programs for assessing soil health, greenhouse gas and carbon dynamics, emerging weeds, pests and disease.**

Seed systems investment (Obj. 3)

Finding: SIMLESA has significantly contributed to stronger seed systems in ESA through broad based public and private sector engagement and support.

SIMLESA Phase 1 and 2 have placed a very strong focus on strengthening seed systems, particularly for maize. We understand that is consistent with program design given there was a specific objective that focused on improved varieties of maize and legumes onto farmers fields. As a reflection for future program design, we would suggest the seed input systems strengthening been “overdone” at the expense of strengthening other input systems that are equally or perhaps more critical. The assumption that appears to underpin seed systems work is that the more varieties released to seed companies the better. The Review Team is unsure that there is any empirical evidence to support that assumption. We can see some potential downsides of a proliferation of varieties in the market place if they don’t provide well defined benefits within well defined adaptation domains. We did not see any comprehensive assessment of either of these issues for the hundreds of maize and legume varieties released to the seed system.

A positive of the seed systems work is it represents a successful engagement with the private sector and we acknowledge that an suggest the skills and experience gained in seed input systems could be relevant to future efforts to improve other input systems such as fertilisers, agro-chemicals, machinery etc.

Recommendation: Beyond Phase 2, consider leveraging experience from seed systems into research that focuses on strengthening other input and output market systems (fertilisers, agro-chemicals, machinery).

Is maize/legume productivity sufficient? (all objectives)

Finding: Lifting productivity in maize/legume systems is a necessary but not sufficient foundation for food and nutritional security.

- There is a place for diversification into activities with strong demand in cash markets
- There are important livelihood dimensions of food/nutritional security that go well beyond the focus of SIMLESA to date.

SIMLESA Phase 1 and 2 have had a strong focus on maize/legume commodities. That is not a surprise as it is implicit in the SIMLESA name. SIMLESA was however positioned within the Australian Government's Food Security initiative in Africa and hence the continuing central relevance of this concept which is much broader than maize/legume productivity.

There has been some opening for livestock activity in association with the forages/residue dimensions of the farming systems but progress appears to have been quite limited in SIMLESA itself. We actually saw no livestock outputs in the program except for a small number of forages progressed through the seed systems activity. We understand there is some more significant livestock value chain activities in the related ??? Project but we would suggest the systems approach in SIMLESA itself has been weakened by the low priority afforded to livestock.

Looking forward we would endorse a stronger focus on farm household livelihoods, including opportunities for enterprise diversification that generates cash from market engagement and potentially contributes to nutritional and health dimensions of food security. We note the market failures for staple crops like maize in many countries with suppressed prices that dis-incentivise productivity investments and surplus generation. In such circumstances, exploring the prospects for spill-overs from cash crop diversification into household livelihoods would appear to be a valid SI strategy.

Recommendation: Beyond Phase 2, we would suggest SIMLESA consider strengthening its livelihoods focus, including the place for diversification in household food and nutritional security. We see this would be critical if SIMLESA was to frame its future in the context of Climate Smart Agriculture (CSA).

Capacity building and gender studies

Findings:

- **SIMLESA's capacity building effort overall is commendable, both in terms of formal post-graduate training for scientists and a range of activities and resources directed at extension, NGOs and farmers. We also recognise less formal spillovers in terms of SIMLESA team influencing the priorities and directions of the R&D system.**
- **There appeared to be some evidence of under-investment in the gender aspects of SIMLESA but also insufficient clarity as to what the gender priorities are for CA adoption.**

Recommendations:

- **Within the Phase 2 wrap-up, a systematic effort under MEL should be undertaken to make the "invisible" achievements in capacity building more visible.**
- **Looking beyond Phase 2, gender investments need to be more clearly focused on supporting the scale-out strategy of SIMLESA achievements. This may require more investment but in a more integrated and targeted way.**

Case for a Comprehensive SIMLESA scale-out Strategy (1)

Findings: SIMLESA does not have a comprehensive scaling out strategy.

- The macro-scale context for SIMLESA scale-out strategy in terms of input and output markets is not tightly crafted. Market failure is a major impediment to scaling out of SIMLESA successes. Input markets (seed, fertiliser, herbicides, machinery) are constrained by an incoherent national strategy in building these industries. There is limited attention to workings of mainstream markets. SIMLESA's scaling-out efforts to date have been dominated by a “reach” paradigm – getting the knowledge out to farmers, demonstrating the benefits etc. The innovative methods being explored (AIPs, CGS) are largely (but not solely) framed within this paradigm. The AIPs and CGS mechanisms are relevant to informing a scale-out strategy but they are unlikely to serve as a scale-out strategy on their own. There is limited evidence of business modelling behind AIPs and the AIP/CGS partnership are not necessarily configured as an “innovation system”. There is ambiguity as to where the CGS investments fit in. There are early signs of success but full evaluation will be critical.

Case for a Comprehensive SIMLESA scale-out Strategy (2)

Recommendations (over next 15 months)

- **SIMLESA needs a comprehensive “scale-out” strategy.** This should consider all dimensions of the innovation system including extension system functionality, fertiliser, seed and agro-chemical input systems, micro-finance, insurance, post-harvest storage and logistics, market penetration and resilience. Looking forward, SIMLESA may need some new partnerships to achieve such a strategy.
- **SIMLESA must undertake diagnosis and differentiation studies for the domestic market.** These should tailor the scaling out strategy, especially the fastest growing local markets and rural towns. There is need to master specifics of “market failures” so that those are addressed more effectively by the capacity building strategies.
- **The crafting of each AIP for scaling out must be built on a sound Business Model.** This will identify pathways from SIMLESA intervention to social and economic success. AIP and CGS partners must be configured into an “innovation system” that integrates the partners and connects them to farmers, producers, entrepreneurs.

The macro-scale context for SIMLESA scale-out – enabling government policy and political will (1)

Findings: While SIMLESA is doing more than most similar programmes, its potential to impact on the policy environment is still to be realised.

- **SIMLESA has tremendous potential to evolve as a true innovation catalyst** if it can re-position around macro-trends especially in perceiving agriculture as part of the rural transformation system and in reconfiguring its partnerships as the programme and circumstances evolve.
- **Agricultural transformation in SIMLESA sites can not happen in isolation**, but as part of a broader process of structural transformation shaped by the inter-linkages between agriculture, the rural non-farm economy, manufacturing and services. In this context it has been difficult to estimate SIMLESA's social and economic impacts to date.
- **A great strength of SIMLESA is its partnerships** across national institutional, CGIAR, other international institutions and partners in private sector, NGOs and farmer groups. But the partnerships are at risk of “lock-in” in the face of evolving needs.

The macro-scale context for SIMLESA scale-out – enabling government policy and political will (2)

Recommendations (over next 15 months):

- **SIMLESA scaling out strategy at national level requires some degree of enhanced government commitment and participation beyond the R&D institutions.** There is need for better diagnostics on “institutional failure” specifics being addressed by capacity building strategies for scaling out. The scaling out strategy must demonstrate impact on the effectiveness on the national agricultural innovation system.
- **Socio-economic components of SIMLESA need low cost approaches to understanding links between farm and non-farm economic activities** in sites, including the diversification of production patterns and livelihoods within the farm- rural non-continuum.
- **SIMLESA partnerships have to evolve based on the research needs and development targets** based on effective positioning of science in the wider innovation system. Partnership efforts at national level are needed to address the challenge of “aggregation” and “agrologistics”.
- **The communication strategy may need to be complemented with a “social marketing”** strategy that ropes in society in engaging issues of sustainable intensification of society’s agriculture and food systems.