

Designing locally relevant visions of livestock sector development for Tanzania

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Key findings

- Agricultural development, including livestock, is crucial for national economic growth and to guarantee nutritional security.
- The CLEANED¹ approach, using the CLEANED R tool, explores alternative ways to increase productivity and well-being while mitigating the amount and distribution of environmental and well-being impacts across the value chain. As such, this contributes to sustainable water and land use management.
- The approach allows local government and value chain actors to translate national policies such as the Agricultural Sector Development Programme Phase II into plans for implementation that are locally relevant and agreed on by all actors.
- In high potential areas, the approach can be used to refine strategies of livestock improvement, while in agro-pastoral areas the approach can contribute to conflict resolution over land use for livestock production.

Tanzania's Agricultural Sector Development Programme Phase II emphasizes that agricultural development is crucial for the growth of the national economy, as well as for providing adequate food to guarantee nutritional security to the Tanzanian population. It calls for enhanced agricultural productivity with sustainable water and land use management, in other words sustainable intensification.

The livestock sector is particularly critical to this development, as it provides:

1. important nutrients for a diverse diet;
2. high value products;
3. risk mitigation for smallholder farmers; and
4. manure for soil health.

However, it is resource intensive and can cause environmental pollution when badly managed.

A three-country project (ResLeSS²) has shown how, by using the CLEANED approach, local government and value chain actors can explore alternative ways to increase productivity of their livestock sector, to produce more animal sourced food while maintaining or even reducing the pressure on their local environment.

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What is the CLEANED approach?

The CLEANED approach is a computer-assisted participatory learning process that aims to understand the opportunities and constraints to local livestock production, taking environmental, equity and well-being considerations into account. It seeks to identify trade-offs and synergies between the environmental and well-being impacts associated with different options for developing a livestock value chain, with a view to designing a locally supported, shared vision of an ambitious yet realistic livestock sector development.

["The CLEANED approach aims to understand the local opportunities and constraints to livestock production."](#)

The CLEANED approach seeks a balance between being implementable within a short time while also being sensitive to the particular context. It does this by combining existing data with local and expert knowledge. The aim is to produce information that is meaningful, capturing the locally relevant dynamics in the livestock value chain.

The CLEANED approach is implemented in four steps:

- A 'reconnaissance tour' during which interviews are undertaken with key informants to identify the major locally relevant livestock trends.

1. Comprehensive Livestock Environmental Assessment for improved Nutrition, a secured Environment and sustainable Development (CLEANED).
2. Research and Learning for Sustainable Intensification of Smallholder Livestock Value Chains in Burkina Faso, Ethiopia and Tanzania.

A first (of two) multi-stakeholder workshop with three objectives. First, to validate major livestock issues as well as the state and use of existing natural resource. Second, to describe locally relevant systems of livestock production and their associated feed baskets (that is, the type and amount of feed and fodder used for livestock in that system). Third, for participants to develop locally relevant well-being indicators to assess the success of livestock livelihood strategies.

- Parametrization of the CLEANED R tool, that can compute locally specific production and environmental impact measures, namely water used for fodder production; greenhouse gas emissions including enteric fermentation, manure management and fodder production; biodiversity losses resulting from land use change for fodder; and soil fertility which compares nitrogen added from manure with nitrogen extracted by fodder production.
- A second multi-stakeholder workshop that supports stakeholders to learn together by playing a game (figure 1). In the game, participants discuss different possible strategies of future livestock development. The CLEANED R tool is used to provide the expected change in environmental impacts for different strategies. The group evaluate each option, considering both the environmental and well-being indicators, and try to reach consensus about

which is best for the local area, taking into account the views and interests of all stakeholder groups (including the most marginalized).

The CLEANED R tool harvests open source geographical data (maps) for context specific climatic, soil and production information for the study area (for example, a particular district). It can be applied to other locations with minimal additional effort. It is context sensitive, as the livestock systems and potential interventions (such as changing feed baskets or land use change dynamics) are adjusted to the local reality, based on the data gleaned during steps 1 and 2 of the approach. The value chain transformation game, played in step 4, provides an accessible and interactive way for workshop participants to discuss future strategies of livestock development. Different local livestock production systems, including different livestock management options and livestock stocking rates, can be explored within the game. Participants discuss and agree their assessment of the environmental and livelihood consequences of different futures, with the CLEANED R tool providing the anticipated environmental impacts. The game allows participants to visualize different possible futures and make changes based on their assessments. Each change can then be explored, with the support of the CLEANED R tool and well-being indicators, so that participants can assess the benefits and constraints of different livestock options.

Figure 1. A farmer delivers milk at a collection centre in Tanga, Tanzania (photo credit: ILRI/Paul Karaimu).



Lessons from high potential highland in Lushoto, Tanzania

The CLEANED R tool for Lushoto, Tanga, Tanzania was parameterized to explore the benefits and trade-offs of improving livestock breeds for dairy production, namely local breeds (*kienyeji*), cross-breeds (*chotara*), and mostly exotic breeds (*kisasa*).

The improved breeds require better management in terms of housing, veterinary services and sufficient high value feed. High value feed means more planted fodder, which competes with food production, and more concentrates such as brans or oil seed cakes which need to be purchased. The group agreed that a move to improved breeds therefore means competition for limited financial resources, such that emergencies may even require families to sell land to maintain good livestock management.

The 2010 scenario agreed by the group showed that an increase of 160 per cent of milk production is possible at the cost of 50 per cent of total staple food production. Participants felt they had no competitive advantage in staple production and already need to purchase it. Getting more income from milk will allow them to be more food secure as well as fulfil their other objectives such as educating children or having a brick house with running water and electricity. In addition, the move to purchased concentrates that do not require land will reduce the overall pressure on land, allowing more higher-producing animals to be kept, or freeing up the land for planting fodder or other economic activities.

“Participants... learned to look beyond their own farm and realized they can benefit from moving to more intensive production together..”

Participants of the workshop learned to look beyond their own farm and realized they can benefit from moving to more intensive production together, as their joint increased demand for veterinary services and livestock related inputs will increase the provision and quality of these services, most likely reducing their cost to individual farmers. Also, by exploring options for 2030 they discovered that

understanding their constraints and planning how to overcome these will help them to reach their objectives.

Lessons from peri-urban agro-pastoral area in Bama, Burkina Faso

In Burkina Faso, the CLEANED approach explored both dairy and meat production in Bama, the peri-urban area of Bobo-Dioulasso, the second largest city of Burkina Faso. The CLEANED R tool was parameterized to explore the co-habitation between two conflicting parties, the sedentary livestock keepers and agro-pastoral livestock keepers. Improving both breeds and livestock management is only possible for the sedentary farmers, as agro-pastoral systems rely on local breeds that are sturdy enough to go on transhumance. Therefore, the CLEANED R tool only allowed for exotic, high producing breeds in the sedentary system.

The pastoral system was set up to mitigate risks by splitting animals into different groups based on travelling distance, each of which had its own set of management options. The scenario for 2030 agreed by the group showed a potential increase of 30 per cent of milk and 80 per cent of meat production. The sedentary farmer will move to exotic breeds with more intensive management, and similarly to Lushoto in Tanzania, rely mainly on planted fodder and concentrates. This reduces the pressure on grazing land that can then be used by the pastoralists for their moving animals that are mainly kept for meat in today's management which mainly relies on grass and crop residues. In return, pastoralists agreed to improve the feed and therefore the productivity of their lactating herd that does not go on transhumance.

“Two conflicting parties came together and listened to each other's arguments with respect.”

In playing the value chain transformation game in a learning space, two conflicting parties came together and, for the first time in years, listened to each other's arguments with respect. Not only did they discover that peaceful co-habitation could be possible, they agreed on better land-use planning that not only secures the pastoral routes (land rights) but also improves the quality and quantity of grass in these areas.

Policy recommendations

What is the potential of the CLEANED approach for Tanzania?

Tanzania's livestock master plan is ambitious in terms of animal sourced food production, especially in the high potential areas. Yet it does not take local resource base or the environment into account. Neither does it suggest how to mobilize actors on the ground.

The CLEANED approach can be used to “down-scale” the master plan to the local context, to develop a shared vision among the different actors of how they can contribute both to their own objectives and to national development. An additional planning step could be added to develop a locally relevant road map to a realistic implementation of the national master plan, in collaboration with local and international businesses and knowledge partners. For sustainable implementation, the CLEANED approach should be a complement to capacity building of local institutions and communities.

The CLEANED approach will yield different benefits in different settings. The focus in high potential areas can lie on improving dairy value chains through management and breeding, making use of a parametrization of the CLEANED R tool similar to Lushoto. By contrast, in agro-pastoral areas, a CLEANED R tool parametrization like Burkina Faso can play a key role in the conflict resolution process between sedentary farmers and pastoralists, and focus on improving the meat value chain.

Further reading

The CLEANED R tool and programming code can be accessed at:

- https://ilri.shinyapps.io/CLEANED_TZA_Lusthoto_ResLeSSf
- <https://github.com/pfeiferc/CLEANED-R>

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