

Out- and Up-scaling of Agricultural Innovations for Rural Households Well-Being

Policy Brief

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Urassa, J.K., Mutabazi, K.D., Graef, F. and Sieber, S.



Plate 1: Tied ridges for rain water harvesting



Plate 2: Kitchen gardens



Plate 3: Maize Sheller



Plate 4: Millet Tresher

Pictures Courtesy: MVIWATA

Executive Summary

Many developing countries, Tanzania included, lack a comprehensive strategy for out- and up-scaling of innovations for improved well-being particularly, in the rural areas. This policy brief recommends that developing countries should consider adopting a framework that makes it a requirement for disseminators of agricultural and other innovations/technologies geared at improving the well-being of rural dwellers to follow the six levels of up- and out-scaling of technologies (for details see Figure 1) so as to ensure the innovations are area and target specific.

Furthermore, before embarking on up- and out-scaling of the innovations it is critical that constraints that may hinder implementation of the innovations are identified and the relevant actions are taken to address them. It is also important to note that successful interventions are often complex to implement hence, the need to consider them in an agricultural systems approach.

Generally, out- and up-scaling of innovations can effectively take place both horizontally and vertically. While horizontal out-scaling is the

dissemination at same-actor level for example from farmer-to-farmer or means-to-farmer-approaches (i.e. radio, field exhibitions, leaflets, farmer field schools, or extension), the vertical up-scaling entail dissemination at different-actor levels leveraging innovations into policy processes, development plans and education programs. Hence, out- and up-scaling is critical to improve and modernize agriculture for enhancing rural livelihoods and national food security at large.

Introduction

Implementing agricultural innovations is a key for improving food security that faces risks such as climate change. The agricultural sector is still Tanzania's central focus for rural development: over three quarters of the population depends on the sector for their livelihoods. Farmers' livelihoods are often compromised due to low productivity and lack of value addition for their produce – mainly due to limited out- and up-scaling of value chain upgrading strategies (UPS). However, there exists UPS that have been empirically proven to work in other areas of the developing world that Tanzanian farmers could take advantage of to raise their productivity and add value to their produce.

Out-scaling involves farmer-to-farmer outreach for knowledge transfer, either to other regions or simply to other target groups within the same region. Up-scaling involves implementation of findings with policy programmes and plans in other regions

Critical conditions for effective out- and up-scaling approach of agricultural innovations

- Innovations need to be tested before dissemination to communities to ensure they can be effective in the local settings so that small-scale farmers can cost-efficiently adopt these new practices.
- Testing outcomes need to be used to further improve the innovations to meet local demands.
- Framework conditions for dissemination of innovations (see Figure 1) need to be adequately addressed.
- Successful interventions are complex to

implement and, thus, need to be considered in a holistic agricultural systems approach.

- Out- and up-scaling of successfully tested and proven agricultural innovations needs a tailored concept for dissemination.
- The dissemination process needs to be based on both the specific site conditions as well as the target groups.

Levels for effective out- and up-scaling (see Figure 1)

- Effective out- and up-scaling of innovations needs to follow the steps in Figure 1.
- Out- and up-scaling is normally influenced by international and national regulations, sector policies such as education, target groups and supporting organizations entailing general public, government, private and non-state sectors.
- Generally, dissemination of agricultural innovations can take place in six (6) levels: and although these mostly relate to up-scaling activities, levels three (3) and four (4) can also apply for out- and up-scaling activities simultaneously.
- Levels, five (5) and six (6) fit more with out-scaling of agricultural innovations as region-specific-concepts on agricultural innovations can be disseminated via farmer-to-farmer approaches.









Defining frameworks	 A B	 C	 D	 E	Legend for innovations/UPS:
1. Legislation at higher level - national or international	Legislation to overcome technical constraints (e.g. fertilizer bag size at distributors), cooperative enhancement for ridging tools	Legislation to construct efficient stoves, tools within defined period and eventual support through micro-credit	Legislation for compulsory learning on tools, machines, devices to be able to store at community level	Legislation for compulsory learning at community schools on nutrition, school gardens to learn on diets and food diversity.	 AB 1a In-situ rainwater harvesting using tied ridges and infiltration pits 1b Fertilizer micro-dosing close to and lateral to the seeds 1c Optimized weeding targeting soil water conservation and curbing weed competition
2. National education at secondary, university level and vocational trainings	Disseminative capacity building of the good practice in curricula at secondary and university levels, and vocational training collages, and farmer field schools	Construction plan on technology of stoves, tools and related processes at Universities for Agriculture and related fields	Storage technology, mobile machines (milling <i>i.e.</i>) as technology in technical universities	Crosscutting university curriculum for nutritionists, nurses, medicine, sanitary professions and community development officers.	 C 2 By-products for bio-energy low-cost pyrolyzer producing bio-char 3 Mobile machines (e.g. for maize shelling and millet threshing) 4 Improved wood supply through tree planting
3. National standardised action plan of innovations	General guiding principles for micro-dosing and tied-ridges applied at local sites	General guiding principles on the construction of respective stoves, processing of tools	General guiding principles on the use of machines, tools and devices including instructions	Kitchen garden concept through school gardens systems disseminated at community level	 D 5 Improved cooking stoves reducing energy consumption 6 Sunflower oil production including investment in oil pressing 7 Optimized market orientated grain storage-systems in PICS 8 Market information access system (m-IMAS) mobile phone
4. Sub-national guiding action plan at district level	Specific innovation integration (fertilizer, ridges, ties, weeding) in combination as tailored local government agencies (LGAs) program	Specific dissemination promoter program with reward incentive structure for implementation of stoves and tools	Specific delivery services at the level of hermetic Purdue Improved Crop Storage (PICS) bags bulking for low-costs purchase, other tools	District level specifics to be defined in promoter programs, regional education, and kitchen gardens	 E 9 Household nutrition education improving diversified diets 10 Kitchen garden implementation, training for dietary diversification
5. Sub-district – local farmer to farmer approach	Exhibitions, demonstration sites for successful cases through hands-on-learning. Specific methods such as community radio can be used	Associations, NGOs disseminate the information via media (school, training, radio, assembly, leaflets)	Associations, NGOs disseminate the information via media (school, training, radio, assembly, leaflets)	Concept of school gardening systems dissemination through famer or primary schools, other media, and teachers	
6. Local – region explicit agricultural innovation	Tailored concepts through extension officers, farmer schools and community representatives to implement innovations	Extension officer, villages promoters (local innovations champions) to be trained by LGAs to tailor the community and school programmes	Extension officer, village promoters (local innovations champions) to be trained via LGAs to tailor the community programs, schools	Specific teacher program at schools, extension officer at farmer schools, children teaching program	

Figure 1: Defining frameworks and conditions of out- and up-scaling activities for effective dissemination (adapted from Sieber et al. 2018)

Conclusion

The policy brief has presented defining frameworks, conditions and ways and levels through which out- and up-scaling of agricultural innovations can be done. Out- and up-scaling of innovations can effectively take place both horizontally and vertically. It is also concluded that effective dissemination and transfer of agricultural innovations is a complex process thus, needs to be considered in a holistic agricultural systems approach rather than in a linear way.

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