



# SOKOINE UNIVERSITY OF AGRICULTURE

# AGROECOLOGY HUB IN TANZANIA

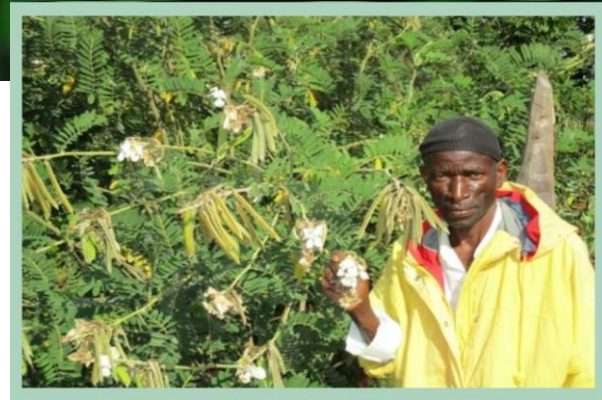
## POLICY BRIEF NO. 2

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# Enhancing Smallholders' Participation in Commercial Production of Bio-inputs in Tanzania

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## 1.0 Introduction

In the context of this document, agriculture is defined, as inclusive of crop and livestock farming. Worldwide, public policies on agriculture generally lean towards industrial agriculture that is dependent on synthetic external inputs such as fertilizers and pesticides. In Tanzania, the use of productivity enhancing agricultural inputs such as fertilizers is reported to be one of the lowest in the region estimated at about 8-10 kg per hectare compared with the Southern African Development Community (SADC) countries' average of 16 kg/ha and 279 kg/ha for China<sup>1</sup>. It wasn't until the government increased subsidies on inputs such as fertilizers and seed through its National Agricultural Input Voucher System (NAIVS) that the use of these inputs recorded some gains suggesting that many farmers are unable to afford the inputs when available at the actual market price.

Despite the desire to increase agricultural productivity, there are concerns for food sovereignty, food safety and health issues as well as interest in protecting the environment from harmful residues from use of chemical inputs<sup>2</sup>. However, given the negative consequences of synthetic inputs, many countries now support the use of bio-inputs through national incentive programmes and regulatory changes<sup>3,4</sup>. This implies there is

<sup>1</sup> URT (2017). Agricultural Sector Development Programme phase II. Government Programme Document. 274 pp.

<sup>2</sup> Lengai, G. and Muthomi, J. (2018) Biopesticides and Their Role in Sustainable Agricultural Production. *Journal of Biosciences and Medicines*, 6, 7-41. doi: [10.4236/jbm.2018.66002](https://doi.org/10.4236/jbm.2018.66002).

<sup>3</sup> Goulet F. (2021). Biological inputs in South America. The Cirad Policy brief Perspective No.55 [https://agritrop.cirad.fr/598359/1/Perspective55\\_Goulet\\_ENG.pdf](https://agritrop.cirad.fr/598359/1/Perspective55_Goulet_ENG.pdf)

increasing support to transition towards agroecology which will also help to protect the environment, biodiversity, and improve food and non-food production systems while contributing to agroecological diversity and resilience<sup>5</sup>.

With the anticipated increase in demand for chemical-free agricultural products among consumers, the biggest challenge is the limited availability of the much needed bio-inputs that is partly caused by the institutional requirements for testing, evaluation and registration which are deemed unsurmountable by those involved in the development of products through individual and/or group innovations. This policy brief is intended to bring to the attention of Government and non-government actors on the need to support innovators from amongst the farming community and other entrepreneurs to achieve increased and/or recognized official participation in the bio-inputs sub-sector. The guiding questions in this policy brief are:

- i. How can bio inputs developed through smallholder farmer ingenuity and/or entrepreneurial innovation be streamlined and commercialized?, and
- ii. What specific actions can be accomplished through government-mediated intervention and non-governmental organizations/institutions to support bio-input development innovations that are subject to testing, evaluation, and registration procedures as a pathway to commercialization of the products.

## 2.0 The slow but eminent shift from synthetic to biological substances and practices

In the crop sub-sector, it is estimated that pre- and post-harvest losses attributed to attack by pests are at an average 30-40% of overall total production which must be reduced and/or ideally, eliminated altogether<sup>6</sup>. *In the livestock sub-sector*, pastoralism is the dominant system accounting for an estimated 90% or more of the livestock population in the country and cattle, the dominant component, is generally underperforming in the production of meat, milk and hides<sup>7</sup>. In the Livestock Development Policy<sup>8</sup> it was determined that the solutions include promoting disease and vector management by enhancing the use of veterinary drugs, protection and management of rangeland resources and improvement of forage conservation practices for dry season feeding. However, in both the crop and animal sub-sectors, actions that could lead to great improvements remain either partially or largely unimplemented to-date. Therefore, it remains to be seen whether the expressed desire in the Agriculture Policy, 2013 URT (2013) that by 2025 (i.e within the next one year), Tanzania would have an “*agricultural sector that is modernized, commercial, highly productive, utilizes natural resources in an overall sustainable manner and acts as an effective basis for inter-sectoral linkages*”<sup>9</sup> can be attained.

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<sup>4</sup> Milheiras S. G., Sallu S. M., Loveridge. R., Nnyiti, P., Mwangi L., Baraka, E., Lala, M., Moore, E., Shirima, D.D., Kioko, E.N., Marshall, A. R and Pfeifer, M. (2022). Agroecological practices increase farmers’ well-being in an agricultural growth corridor in Tanzania. *Agronomy for Sustainable Development* (2022) 42: 56 <https://doi.org/10.1007/s13593-022-00789-1> (seems incomplete - see the beginning of the sentence)

<sup>5</sup> FAO (2018) Second International Symposium on Agroecology. Scaling up agroecology to achieve the sustainable development goals (SDGs). <http://www.fao.org/about/meetings/second-internationalagroecology-symposium/en/>

<sup>6</sup> URT (2013). The National Agricultural Policy. Dar es Salaam. Ministry of Agriculture, Food Security and Cooperatives. 51 pp.

<sup>7</sup> Baltussen, W., van Berkum, S., Dijkxhoorn, Y., Helmes, R., Özkan Gülzari, Ş, Vellinga, T., Massawe, G. D., Galgani, P., Borniotto, D., van den Elzen, F. and Smith, T. (2019), Traditional livestock systems in Tanzania; An application of the TEEBAgriFood Evaluation Framework. TEEB for Agriculture and Food, UNEP.

<sup>8</sup> URT (2006). National Livestock Policy. Dar es Salaam. Ministry of Livestock Development

<sup>9</sup> URT (2016). ASDS II (Agricultural Sector Development Strategy Phase II): 2017/18 to 2027/28. Dar es Salaam. Ministry of Agriculture

Modernized agriculture is synonymous with extensive use of industrial synthetic inputs such as chemical fertilizers, chemical pesticides and drugs for the control of animal diseases and vectors. To avoid over-dependency on synthetic industrial inputs which are generally priced beyond the affordability of many farmers, smallholder crop farmers and livestock keepers, as individuals or in groups, have developed local solutions for crop pest management in the field and in storage; soil nutrient and water management technologies and remedials against livestock diseases and parasite control, to name a few. The local solutions are based on using readily available biological substances such as mixtures of different wild/and domesticated plants, animal products and/or household/animal waste including animal excreta, ashes and urine which are locally formulated and generally referred to as Biological Substances and Practices (BSP)<sup>6</sup>.

By opting to use biological substances, farmers are attempting to move away from the use of commercially available chemical inputs. However, the substances, in most cases, are not legally recognized and have limited circulation and availability in commercially-operated agricultural input outlets/shops. As a result, the market value of such substances is unknown and/or difficult to determine and their contribution in the sector is difficult to gauge. However, despite the various limitations, through the use of BSP, farmers have not only cut down production costs but also improved productivity and their wellbeing<sup>6</sup>.

The process of producing BSP using crude preparation procedures from plants or products of animal origin tend to be, *inter alia*, unstandardized with no assurance of standard active ingredient concentration, the shelf life is not clearly defined and the stability, efficacy and application dosage rates have not been verified through standard procedures. These anomalies often confine availability of the substances mostly through spot markets within specific locations or groups of farmers rather than being products that are legally available for sale and use throughout the country. As a result, it is not practically feasible for extension workers to advocate widely the use of such biological substances

### **3.0 Institutional Support for Commercialization of Agricultural Inputs**

Tanzania has legislative instruments that support commercialization of both synthetic and biological inputs. In the case of the crop sub-sector, the instruments include a legal framework for managing all issues related to plant health<sup>7,8</sup> and issues surrounding soil fertility management and soil health in general<sup>9,10</sup>. In the livestock subsector, the guiding principles and regulations governing livestock drugs are also covered under guidance of the responsible Ministry<sup>11</sup>.

On the one hand, the official Register of pesticides for pest management in crops is predominated by synthetic chemical products and the situation is no different in the case of drugs for management of animal diseases and parasites. On the other hand, however, stakeholders throughout the value chain from production to

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<sup>6</sup> These are variously referred to as indigenous practices, local knowledge, local innovation, organic inputs, botanical materials, biological materials, biomaterials, biopesticides and biological control practices (see 10, 11, 12).

<sup>7</sup> URT (2020). The Plant Health Act, 2020. Dar es salaam. Ministry of Agriculture.

<sup>8</sup> URT (2023) The Plant Health Regulations, 2023. Dodoma. Ministry of Agriculture.

<sup>9</sup> URT (2009). The Fertilizers Act, 2009. Dar es salaam. Ministry of Agriculture.

<sup>10</sup> URT (2011). The Fertilizers Regulations, 2011. Dar es salaam. Ministry of Agriculture.

<sup>11</sup> URT (2017) Livestock Sector Analysis (LSA) for the period 2016/17 to 2031/32 (URT,2017). Dar es Salaam. Ministry of Livestock and Fisheries.

consumption have, in recent years, expressed the desire and willingness to reduce dependency on synthetic inputs. These developments are supported by the need to improve food and environmental safety as well as to avoid the prohibitive costs of synthetic inputs, particularly industrial fertilizers and pesticides<sup>12</sup>.

Participants in an AE stakeholder policy forum on bio-inputs organized by Agroecology Hub in Tanzania bio-inputs forum<sup>13</sup>, raised concerns on the high cost involved in the testing, evaluation and registration of bio-inputs to qualify for commercial production and trading of the products. Generally, the stakeholders felt that the procedures are costly, complex and do not favor the majority of the emerging innovators involved in production and selling of bio-inputs as required.

In recognition of the important contribution of smallholder farmers in the promotion of AE in the country, institutional support to innovators must be provided to ensure that quality biological inputs from innovations by farmers and from the general public can be accessed through official channels and that they are readily and widely available for sale in agro-input outlets.

The Government of Tanzania inaugurated the National Ecological Organic Agriculture Strategy (NEOAS) on 9<sup>th</sup> November, 2023. Since then, support and calls for positive action for realization of the strategies in the NEOAS have come from different quarters. One of the most recent and prominent voices has been from the Parliamentary Standing Committee for Industries, Trade, Agriculture and Livestock that urged the government to expedite implementation of the strategy (Raia Mwema Newsletter, Wednesday 17<sup>th</sup> April 2024) in support of Agroecology intensification. It is therefore expected that the launching of NEOAS in 2023 should be supported by positive actions that can expedite the promotion of agroecology in the country. For this endeavour to be successful, there must be facilitation to reach a situation in which biological inputs of known quality are also available commercially to support the increasing demands anticipated as AE intensification is promoted for wide adoption by agriculture practitioners in the country.

Therefore, we argue that the Government should consider subsidizing the costs involved in the process of testing, evaluation and registration of bio-inputs developed by smallholder farmers as per requirements outlined in the legislations governing all matters related to plant health, fertilizers, drugs for animal diseases and parasites and other plant and animal growth promoters of biological nature.

#### 4.0 Conclusion and Way forward

Various challenges stand in the way of promoting the use of bio-inputs, and ultimately protection of the environment, enhancement of biodiversity, as well as increase agricultural production in the country. Realization of the outcomes from agroecological intensification requires specific policy interventions to guide the process of implementation of the NEOAS. The outcome which would ultimately result in the intensification of agroecology in the country would also require joint efforts involving farmers, entrepreneurs, government, and non-government organizations.. *Inter alia*, there is need to put in place incentive systems and revision of some of the Regulations and guidelines to support involvement of farmer entrepreneurs and other innovators in the testing, evaluation and registration of bio-inputs.

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<sup>12</sup> Khurshed, A., Rather M. A., Jain, V., Wani, A. B., Rasool, S., Nazir, R., Malik, N. A and Sheikh Abdul Majid (2022) Plant-based natural products as potential eco-friendly and safer biopesticides: A comprehensive overview of their advantages over conventional pesticides, limitations, and regulatory aspects. *Microbial Pathogenesis* Vol 173, Part A, Dec 2022, 105854.

<sup>13</sup> Agroecology Hub in Tanzania (2022). Bio-inputs Stakeholder Policy Forum, 6<sup>th</sup> October 2022. Pp. 10 unpublished Project Report

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