THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF AGRICULTURE

TANZANIA AGRICULTURAL RESEARCH INSTITUTE

Ref. No. AB.166/288/01C/100 **10 October, 2025**

TO ALL TARI STAFF

RE: ADVERTISEMENT OF PhD AND MASTERS DEGREE SCHOLARSHIPS UNDER TANZANIA FOOD SYSTEMS RESILIENCE PROGRAM (TFSRP).

Tanzania Agricultural Research Institute (TARI) is one of the implementing partners of the World Bank funded Programme called Tanzania Food Systems Resilience Program (TFSRP) The overall objective of TFSRP project is to support food systems resilience by strengthening agricultural service delivery, the adoption of climate resilient technologies, and fiscal performance in the agricultural sector. The TFSRP result areas (RA) are: RA1 - improving service delivery in research, extension, and seed; RA2 – developing resilient rural infrastructure; and RA3 - strengthening fiscal performance to enable delivery on priority investment areas. One of the deliverables of the project is to build capacity of highly talented TARI employees at National Universities.

TARI through TFSRP has ~~85~~ scholarships for postgraduate studies for applicants interested in undertaking studies in domestic higher learning institutions. Therefore, the Institute hereby invites TARI Staff to apply for scholarships to undertake Masters and PhD studies in the study areas highlighted hereunder.

1. STUDY AREAS OF INTEREST FOR POSTGRADUATE STUDIES

1.1 Applied Biometry/biological statistics

Description and focus for research topics*:* The research topics should relate to testing experimental designs, data analysis methods, testing theories in agricultural statistics. A researcher interested in development of models will be given high priority; also, candidates interested in agricultural data science and analysis will be considered.
Number of scholarships: **4 MSc.**

1.2 Pest management using Entomopathogenic agents

Description and focus for research topics: Fungi have continued to cause significant yield losses in all crops leading to overuse of inorganic pesticides to manage them. Discovery and application of entomopathogenic fungi and nematodes can serve as an alternative to use of inorganic pesticides. Therefore, the candidate will either study entomopathogenic fungi and molecular entomology whereby the candidate will apply molecular biology techniques to study insects, focusing on their genes, proteins, and other molecules to understand their biology, behaviour, and evolution. Preferably the candidate will focus on scarabs infesting sugarcane or infesting other crops in Southern Highlands of Tanzania (and spreading to other areas in Tanzania). Other pathogens (bacteria, nematodes and viruses) that may kill pests can be studied. Outputs will include patenting and recommending at least one biological control entomopathogenic agent.

Number of scholarships: **3 MSc and 1PhD**

1.3 Molecular Biology and Pathology

Description and focus for research topics: Climate change and variability have led to unprecedented surge and outbreaks of diseases and pests. Moreover, rapid identification, diagnosis and detection remain a challenging task in agriculture. Applicants should express their interest to conduct research in methods for molecular detection of pathogens (viruses, nematodes, and bacteria) or emerging pathogens. The candidates can also study genetic diversity of fungi and bacteria and unravel their virulence or focus on genomics (and metagenomics) of plant bacteria, viruses and fungi infecting crops in Tanzania. At least one of the applicants will have to focus on spread, genetic diversity and management strategies the for Banana bunchy top virus (BBTV).

***Number of scholarships**:* **6 MSc and 1 PhD**

1.4 Application of Artificial intelligence and ICT in agriculture

***Description and focus for research topics*:** TARI is keen to capitalize on the use of artificial intelligence and ICT in advancing agricultural research in Tanzania. AI has many uses in agriculture including but not limited to detection of diseases, aiding in collection of data for plant breeding, yield prediction and planning, and automated farming tasks. Expression of interested is invited for any topic that aims at application of artificial intelligence in agriculture (precision agriculture, pathology, entomology, soil health, crop breeding etc.).

Number of scholarships: **6 MSc and 1 PhD**

1.5 Determination of crop biogeography in Tanzania

Description and focus research topics: The candidate will focus on crop biogeography. For example, may map distribution of crops in the country, their genetic diversity and possible introduction of the crops in non-traditional crop areas. One of the two students may evaluate validity of current criteria in demarcation of agro-ecological zones in Tanzania.

Number of scholarships: **2 MSc and 1 PhD**

1.6 Management of invasive weeds in Tanzania

Description and focus research topics: Noxious weeds such as *striga spp*, and invasive species namely Kongwa weed (*Astripomoea hyoscyamoides*) and Parthenium (*Parthenium hysterophorus*) are significant threats to agriculture, pastoralism, and biodiversity because they reduce crop yields, limit grazing land, and displace native vegetation. The candidates are expected to undertake a study to develop management strategies for any of these weeds. The applicant may be considered to study weeds in water bodies that are important for irrigation or navigation of agricultural equipment/materials.

Number of scholarships: **2 MSc and 2 PhD**

1.7 Studies in plant nutrition and crop physiology

***Description and focus research topics*:** The candidate will select a crop of his/her interest and relate nutrients uptake in different soils and different varieties. Plant-microbe interactions relevant to nitrogen fixation as well as plant-environment interactions necessary for nutrient uptake are areas suggested for postgraduate studies. Crop physiology can be studies with aim to generate information necessary for crop adaptation to biotic and abiotic stressors/climate change.

Number of scholarships: 4 MSc (2 Nutrition and 2 Physiology)

1.8 Molecular and Conventional plant breeding

***Description and focus research topics*:** The applicants should demonstrate their readiness to undertake studies in plant breeding with the aim of improving yields or improving crops to adapt to climate change. The crops of interest for plant breeding, in order of preference, are coconut (tolerance to coconut lethal disease or development of high yielding dwarf varieties), sunflower (hybrids or high oil content OPVs and tolerance to important viral diseases) and potato (high yielding, tolerance to fungal and bacterial diseases and meeting requirements for other market segments).

***Number of scholarships*: 3 MSc and 1 PhD**

1.9 Application of Mutational atomic breeding for development of crop varieties

Description and focus research topics: The applicant should be ready to use mutational atomic breeding techniques in development of crop varieties. The crop of interests are cotton, rice and maize. The applicant may take advantage of experience from on-going activities regarding mutational breeding at TARI Dakawa, TARI Selian and TARI Ukiriguru.

***Number of scholarships*: 2 MSc and 1 PhD**

1.10 Application of nanotechnology for precision agriculture

Description and focus research topics: Nanotechnologies are emerging agricultural technologies in our country. In agricultural sector, nanotechnology can be applied in crop production, food processing and packaging, food security and water purification, environmental remediation, crop improvement, and plant protection. Preference will be for the studies which aim at testing and evaluating proven nanotechnologies in Tanzania.

***Number of scholarships*: 2 MSc and 1 PhD**

1.11 Nutritional profiling in plants and human nutritional benefits of crop varieties

Description and focus research topics: In developing countries most people consume foods from plants that they grow. Thus, growing nutrient dense crop varieties could translate into reduced malnutrition in smallholder farmers' households. The challenge has remained to be a lack of data about levels of nutrients in crop varieties developed by TARI and how these levels are affected by growing plants in diverse environments. Postgraduate studies under this category will be focused on how selected nutrients of a given crop vary across agro-ecological zones. The studies may as well investigate accumulation of toxic compounds in a given crop across zones and may seek to answer a question do varieties with certain compounds translate to reduced malnutrition in children or pregnant and lactating women?

***Number of scholarships*: 2 MSc 1 PhD**

1.12 Plant biodiversity studies for domestication of wild plants

***Description and focus research topics*:** The candidates will evaluate existing germplasm and compare with information from different communities. The candidate may choose to map or gather information on threats posed to certain species of plants in Tanzania. The candidate may as well use molecular techniques to compare genetic diversity of certain species in wild and from historical herbarium preserved species. Are edible plants in herbarium still available in wilderness? Any evidence of impact of climate change on edible wild plant? Applicants interested in generating

information for domestication or collection of medicinal plants for germplasm conservation and use in agriculture are encouraged to apply.

Number of scholarships: **2 MSc and 1 PhD**

1.13 Agricultural practices and technologies for management of conflicts between pastoralists and farmers.

***Description and focus research topics*:** Conflicts between livestock keepers and farmers have been experienced in different areas of our country. Scarcity of land for grazing due to increased human population and climate change which results into less and less pasture for grazing are some of the causes of conflicts. A study is needed to unravel and document underlying causes of conflicts between farmers and livestock keepers and recommend evidence-based strategies for management of conflict – what agricultural practices and technologies will reduce conflicts and misunderstanding between the two communities; informing the policy is key to this.

Number of scholarships: **1 PhD**

1.14 Socio-economics – state of adoption of agricultural technologies, impact and impediments

Description and focus research topics: The adoption of agricultural technologies is still low (mostly below 30%) and the impact has not been determined for disseminated technologies. Stock taking of agricultural technologies and assessing their adoption (e.g., using existing data from previous studies) and followed by a deep dive into underlying causes of inadequate adoption of agricultural technologies. The candidate is expected to generate data that will inform decision makers on reforms that should be made to ensure there is efficient and effective transfer of agricultural technologies from laboratories and experimental sites to markets.

Number of scholarships: **2 PhD**

1.15 Management of pesticides and other agricultural chemicals

Description and focus research topics: We live in an era of unprecedented use of chemicals in form of fertilizers and pesticides. Unfortunately, these chemicals have been implicated to have effect on human health as well as in contaminating environments. In some instances, pesticides are thought to be deliberately sprayed onto vegetables, including tomato a few hours or days before harvesting. As research institute, TARI ought to generate evidence to show the magnitude of this problem in the country so as to be able to provide evidence-based advice to policy makers. The candidates may generate information on extent of use of the problematic fertilizers/pesticides and establish residues in water bodies, soils and plants (tomatoes). The candidate may develop models to predict/simulate persistence of pesticides and fertilizers in Tanzanian soils. Applicants interested in models will be required to identify the supervisor prior to being sponsored

Number of scholarships: **3 MSc and 1 PhD**

1.16 Development and dissemination of Climate smart agriculture

Description and focus research topics: The candidates may evaluate or develop climate smart agriculture technologies/practices in semi -arid areas (the technologies exclude crop varieties). The candidate may as well opt to determine the economic soundness of the CSA practices. Outputs will include recommending climate smart technologies for semi-arid areas based on efficiency and cost-effectiveness (economics).

Number of scholarships: **2 MSc and 1 PhD**

1.17 Development of Biopesticides/Botanicals for management of pests

Description and focus research topics: The candidate will aim to discover biopesticide from plants species in Tanzania. The candidate may revisit and evaluate commonly stated biopesticides but whose efficacies have never been rigorously tested; outputs will include patenting at least one biopesticide.

Number of scholarships: **2 MSc and 1 PhD**

1.18 Agricultural and bioprocessing engineering and technologies

Description and focus research topics: Post-harvest losses are estimated at about 30%. Therefore, there is a need to come up with technologies that can reduce post-harvest losses. Moreover, the applicants under this category can identify and develop a topic on irrigation engineering and labour-saving technologies. Studies to indicate constraints and solutions for agro-mechanisation are admittable.

Number of scholarships: **4 MSc**

1.19 Deliberate funding for ongoing studies previously under USAID support

Description: TARI is aware that a few staff were affected when USAID scholarships were terminated following policy realignment by the US Government. Funding of these on-going studies is unconditional provided the staff provides evidence of nomination for higher studies under USAID or USAID funded organizations and a proof of study leave granted by the Institute (TARI). The staff will also provide a termination notice from the funding organization. The TFSRP support will cover costs from this financial year (FY 2025/2026).

Number of beneficiaries: 1 PhD

1.20 Dynamics of gender in agricultural research and development

Description and focus research topics: The rapid changes in agriculture present opportunities for both women, youth and men. At the same time the composition of household is also rapidly changing with youth migrating to other non-farm activities like boda boda. In some regions, men more than women are likely to abandon agricultural activities at home and migrate elsewhere to seek income in other sectors. Therefore, it is important to clearly understand the gender dynamics for enhancing optimal policy and planning for agricultural development. The candidate will thus focus his /her study specialization on approaches in Gender and economic development practices in agriculture perspective.

Number of scholarships: 1 Msc

1.21 Science Communication (Mass Communication Major)

Effective communication of research and innovations is essential for ensuring that scientific knowledge reaches policymakers, stakeholders, and the public in a clear and actionable way. This field focuses on translating complex scientific concepts into engaging messages using media, journalism, education, and marketing. Staff applying for this scholarship are expected to have or develop skills in simplifying complex scientific information, designing communication strategies, using media and digital platforms, and producing content that promotes awareness and adoption of TARI's researched technologies. They are also expected to develop materials such as articles, policy

briefs, press releases, videos, and social media content that enhance understanding and application of TARI innovations.

Number of scholarships: 2 MA

1.22 Information, Knowledge Management, and Communication

Efficient management and sharing of research information are essential for ensuring that innovations are accessible, well-documented, and effectively communicated to stakeholders. This field focuses on managing information and facilitating effective knowledge sharing within organizations and among stakeholders. It enhances how research outputs and innovations are stored, accessed, and communicated. TARI is looking for candidates with strong skills in information management, knowledge dissemination, organizational communication, and the use of digital tools to support collaboration and informed decision-making.

Number of scholarships: 2 MA

1.23 Data Management

TARI requires experts who can manage and utilize large volumes of research data to enhance planning, reporting, and evidence-based decision-making. This field focuses on advanced methods for data handling, analysis, storage, and application to support research and development. The preferred candidate should possess strong competencies in organizing, interpreting, and applying data insights to improve research efficiency, accountability, and innovation within the institute.

Number of scholarships: 2 MSc

1.24 Studies for other staff cadres (administration, accounts, procurements, registry etc.)

Courses: to be agreed upon after submission of applications

Number of scholarships: **10 MSc and 1 PhD**

2. SUGGESTED DEGREE PROGRAMMES

The applicants are reminded to have already been admitted for degree programmes at domestic (local) higher learning institutions prior to applying for the scholarships. The applicants for scholarships may consider any of the degree programmes shown below but may as well identify other degree programmes because what matters most is the development of a topic or committing to do research in research areas listed above. However, the degree programmes pursued must be those that are acceptable under TARI Schemes of Service. Therefore, no study leave will be granted for applicants who pursue degree programmes not contained in the Schemes of Service. Likewise, PhD degree programmes must be acceptable as per TARI Schemes of Service.

- MSc. in Molecular Biology and Biotechnology
- MSc. in Crop Science
- MSc. in Life Science
- MSc. in Sustainable Agriculture
- MSc. in Botany
- MSc. in Bioinformatics
- MSc. in Agriculture Engineering
- MSc. in Agricultural Data Science

- MSc. in Agricultural and Applied economics.
- Master in Information and Knowledge Management
- Masters in Vertical Farming and Controlled Environment Agriculture (CEA)
- Masters in Agricultural Robotics and Automation
- Masters of Public Relation and Mass Communication
- Masters Degree of Management Information System
- Masters Degree in Cybersecurity
- Masters Degree of Accounting and Finance
- Masters of Laws (LLM)
- Masters Degree in Materials Management, Procurement, Supplies.
- Master in Human Resource Management

3. GENERAL CONDITIONS

- All candidates must be TARI employees;
- Not more than 45 years old;
- All candidates must attach a letter of motivation and Concept Note research;
- Candidates must attach an up-to-date Curriculum Vitae (CV);
- Candidates must attach their certified copies of academic qualifications;
- All applicants must attach College/University admission documents;
- Women are highly encouraged to apply;
- Deadline For application is Seven days (7) from the date of this announcement.

Please apply to the following address:

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Tanzania Agricultural Research Institute,
Makutupora, Arusha Road,
P. O. Box 1571,
DODOMA.
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