**TANZANIA AGRICULTURAL RESEARCH INSTITUTE**

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**Quarterly Report on Research, Management and Coordination Progress**

**For the period of 1st October-December 31st 2021**

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**TARI Mikocheni**

**31th December 2021**

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# **Abbreviations and Acronyms**

AVRDC African vegetable research and development centre

BMGF Bill & Melinda Gates Foundation

BBSRC Biotechnology and biological sciences research council

CIMMTY International Maize and Wheat Improvement Centre

COSTECH Commission for science and technology

EAT East African Tall

EAV-IPMIL East African vegetable integrated pest management initiative laboratory

FAO Food Agriculture organization

NAB National Australia Bank

ICIPE International centre for insect physiology and ecology

IPM Integrated pest management

NaCRRI National crop research resources Institute

NCDP National coconut development program

NRI Natural Resource Institute

NCSU North Carolina state University

SPLCV Sweet Potato Leaf Curly Virus

TARI-MKN Tanzania agricultural Research Institute Mikocheni

TOSCI Tanzania official seed certification agency

USAID United State of Agency for International Development

# **1. Introduction**

Tanzania Agricultural Research Institute-Mikocheni (TARI-MKN) is one of the 17 research centres under TARI. It was established in March 1996 as a measure to sustain and institutionalize coconut research and development activities conducted by the then National Coconut Development Programme (NCDP). The NCDP was established by the Government of the United Republic of Tanzania in the fiscal year 1979/80 with the aim to promote coconut production and utilization in the country. The program covered the whole coastal belt of Tanzania and the Island of Zanzibar.

TARI-Mikocheni mandate is in two-folds, namely conduct and promote research for the development of the coconut sub-sector and promote research and utilization of agricultural biotechnology for socio-economic development in the country.

The centre’s head office is in Dar es, salaam at Mikocheni B, Plot 22 along the Coca cola Road. It has two sub-stations, namely Chambezi and Mkuranga, where most of the research activities are conducted. The former is located about 55 km north of Dar es salaam near Bagamoyo town at latitude S6.520 and longitude E 38.910, while Mkuranga sub-station is located at S 7.120 and longitude E 39.200, about 50 km south of Dar es salaam.

There are two departments: 1) Research and Innovation and, 2) Technology Transfer and Partnership. Under these departments there are six subprograms: crop research, natural resources, post-harvest management, socioeconomics and marketing, technology dissemination, commercialization and partnership, and knowledge management and communication programs. The institute is within the eastern zone together with TARI Kibaha and TARI Mlingano.

The Mikocheni centre basically has two research programs, which are its mandates: coconut and biotechnology. The coconut program is the main with 4 research units which include: agronomy, disease control, pest control, social economy, post-harvest and technology transfer, the biotechnology program accommodate 3 units: tissue culture, molecular diagnostics and genetic engineering laboratories. All the research activities in each unit in the coconut program are designed to address all agricultural challenges facing the coconut agroecological systems. whereas in biotechnology as a tool cuts across all crops and supports other research mandates.

Research at TARI-Mikocheni has mainly depended on government competitive grants through Commission for science and technology (Costech) and external support from different international funding organisations mainly the “Bill & Melinda Gates Foundation” (BMGF), Bio innovate Africa II, Biotechnology and Biological sciences research council (BBSRC), Food and agriculture organization (FAO) and International Centre for Insect Physiology and Entomology (*Icipe*). In this reporting quarter (July to September 2021) the institute operated a total of 6 research projects with financial support of **Tshs. 35,845,678.73** of which 0% is from Tanzania government and 100% from the international donor support.

Thus, in this quarter, using the available support, the institute recorded achievements in research activities by: i) initiation of sisal invitro cultures for the mass propagation of sisal planting materials at TARI Mlingano and Mikocheni, ii) replanting of 2nd season field trials for evaluation of seed treatment for cassava cuttings technology using pesticides, harvesting in on farm and stations, iii) distribution of seeds of new improved varieties for Amaranthus to farmers in Pwani and Dar es Salaam farmers, iv) control measure for tomato leaf miner (*Tuta absoluta*), and v) continue provision of laboratory services to Tanzania official Seed Certification Institute (TOSCI) on GMO testing of all imported seeds.

In line with technology development, the institute also continued with the production of quality seeds for coconut and planting materials for sweet potato, and banana as well as dissemination of IPM technologies for vegetables and cassava growers on safe handling and use of agrochemicals for pest control and whitefly infestations. The institute also conducted a successful the 3rd Internal program review (IPR) meeting for eastern zones.

# **2. Research Programs /Activities conducted in this quarter**

## 2.1 Coconut research program

The centre continued to maintain its coconut germplasm, seed nursery and weeding in coconut orchards. In this quarter, the two coconut program implemented the following activities:

* continuing maintaining coconut seedling nurseries at Chambezi and Mkuranga for selling on the coming rainfall season on March-April 2022. A total of 4,300 nuts sown at Mkuranga (1,300) and Chambezi (3,000), respectively. The sowing is still continuing to achieve a target of 15,000 seedlings/year.
* Rehabilitation of coconut germplasm, where 2 blocks (each 8ha) has been prepared for planting on March 2022 with coconut East African Tall accessions
* Conducted disease surveys at Milola ward in Lindi Municipal, to assess the effect of Lethal disease (LD) following a request from the district authority.
* Preparation of the LD status at Lindi where the findings showed the disease is localised in several 8 wards: Ngapa, Tandangongoro, Rutamba and Milola. Also in some farmers fields in Mbanja, Mchinga, Kilangala and Mirumba. In these areas LD was most severely affected

#### **Sweet potato project**-(Bio innovate II)

This project is officially closed since June 2021. Though the project closed but it still maintain a total of 15,000 vines of Mataya and Jewel currently being bulked in the screening house. The vines are targeted for long rains of March April 2022. No vines was sold

* MSc student Mr. Castory Kibiki partially supported by the project (Bio innovate II), successful defended his thesis on “Economic analysis of virus free sweet potato production in the Lake and Coastal zones of Tanzania”. He graduated on November 2021 at Sokoine University of Agriculture (SUA), Morogoro

### **Disease control unit**

**2.1.2.1. *Sweet potato leaf curl virus* (SPLCV) next generation sequencing project**

This project is addressing sweet potato disease funded through COSTECH entitled “Next-generation sequencing based investigation of genetic diversity and distribution of sweet potato leaf curl viruses and their effect on sweet potato in Tanzania” is currently winding up on No cost extension mode until December 2021.

The goal of this work was to increase knowledge of sweet potato leaf curl virus diseases in Tanzania and thus enable development of management strategies for the same, with specific objectives to: 1) Determining the occurrence and spread of sweet potato leaf curl viruses (SPLCVs) in sweet potato plants in Tanzania, 2) Determining the genetic diversity of isolates of SPLCVs in Tanzania, and 3) determining the yield losses caused by the SPLCVs. In this quarter the project accomplished the followings:

* Finalise the preparation of the 2nd manuscript on the “Detection and analysis of evolution of isolates of sweet potato leaf curl viruses infecting sweet potatoes in Tanzania. The manuscript has been submitted for publication in the Physiological and Molecular Plant Pathology journal
* MSc student Ms. Hilda Bachwenkizi partially supported by the project submitted her thesis to the university she is awaiting for the defence
  + 1. **Pest control unit**

The unit continued to implement a project on ‘Combating Arthropod Pests for Better Health, Food and Climate Resilience (CAP) in Tanzania’. The objective is to generate knowledge on common arthropod pests affecting avocado, tomato and cucurbit to enable growers plan crop calendar and their measures.

* Conduct training on mango fruit flies management and postharvest management techniques to Mango growers in Mkuranga district, Coast.

### **Agronomy Unit**

### The unit has been running 2 projects on horticultural crop since 2018 in collaboration with AVRDC

#### **Amazing Amaranths and Eggplant projects**

In this reporting period the achievements included:

1. ESTABLISHMENT OF Trichoderma X AMF field trials in 4 sites
2. Seven farmers field day conducted in 7 districts (Ilala, Temeke, Kinondoni, Kigamboni, Ubungo, Kibaha and Bagamoyo
3. Collected harvest data form mango orchard in Chambezi site
4. Prepare proposal for coconut

### **Post-harvest technologies unit (PHT)**

The emphasis of the PHT Unit had been on developing, testing and promoting small-scale coconut oil processing technologies and the utilization of coconut products and by-products. The unit has not produced oil this quarter due to shortage of coconuts. The harvest has adversely affected by prolonged dry spell.

## 2.1.6 Socio-Economic and Marketing Research Unit

The unit focus has been on developing improved and appropriate technologies that are affordable under farmer’s conditions. Its main activities are: i) Identification of production constraints and opportunities through participatory approaches and, ii) conducting adaptive on-farm experiments, socio-economic surveys and impact studies

### **Research activities in this quarter**

1. **Marketing and value chain studies**

In this reporting period the unit carried out the following activities:

1. Harvesting data collection from MandisPlus field trial from contact farmers in Miono village Bagamoyo for computation of Cost benefit analysis of the promoted technology of cassava cutting dressing with limited chemical and frequencies for the control of whitefly infestation was completed and the analysis report is being compiled

## 2.1. 7 Biotechnology program

The program has been running 2 biotech related projects and provision of biotech laboratory services to stakeholders’ peer institutions. In this quarter the implemented activities include:

### **Molecular entomology**

This is the regional project titled “African Cassava Whitefly: Outbreak Causes and Sustainable Solutions with funding from BMGF through Natural Resource Institute of (NRI)-United Kingdom from 2018 to 2022.

In this project TARI has implementing 4 of the 5 aims:

1. The team has completed collection of harvest data on Whitefly resistant cassava variety technology evaluated in 16 demo field trials established in 7 districts
2. Harvesting and yield data collection from 16 on farm trials established in 7 districts completed
3. Agronomic data on the 2nd season cassava variety evaluation on 16 on-farm trials in Sengerema, Bunda, Muheza, Mtwara rural and Nyasa is continuing
4. Replanting of 2nd season on station and on farm trials in Chambezi, Mkuranga and Muheza district.

**2.1.7.2 East Africa IPM Innovation Lab: Research and Technology Transfer for Vegetable Crops Project**

TARI-MKN has also been implementing a USAID-funded project titled “East Africa IPM Innovation Lab: Research and Technology Transfer for Vegetable Crops since 2018 to date. The project is implemented in collaboration with regional and in country partners for 4 years from 2018 until 2020. In this project TARI has been implementing objective 2 and 3 which include:

1. Conduct long and short-term training and capacity-building in i) IPM systems and ii) pest diagnostics, with an emphasis on adoption of modern communication tools when and where appropriate

**Other activities of the program include:**

1. Application of tissue culture techniques for mass propagation of different crop such as banana, sweet potato, pineapple, and cassava
   * + 1. **Plant Tissue Culture Unit (TC)**
       2. **Masspropagation of planting materials**

The unit has continued to provide technical backstopping to TARI Mlingano TC lab. on micropropagation of sisal planting materials. Currently, is maintain a total of 160 clean cultures of sisal initiated on August 2021. Additionally, 1200 *invitro* culture have been initiated (1,000 at Mlingano) and 200 at Mikocheni. The two culture are project to produce 6,000 seedlings after 5 cycles.

**Cassava seedlings**

A total of 398 pathogen free cassava *invitro* plants (**Table 2**) were produced and delivered to TARI Kibaha for hardening and establishment of germplasm through ACWP-2 project. The materials are introduced germplasm that will be introduced in the screenhouse at Chambezi substation, Bagamoyo for project activities.

**Table 2A. List of *invitro* plants produced for ACWP-2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SN** | **Genotype** | **Crop** | **Origin** | **No. Plants delivered** |
| 1 | ECU 72 | Cassava | South America | 66 |
| 2 | PER 415 | Cassava | South America | 63 |
| 3 | PER 608 | Cassava | South America | 21 |
| 4 | TANGOLO | Cassava | Tanzania | 63 |
| 5 | Ofumochi | Cassava | Uganda | 35 |
| 6 | Magana | Cassava | Uganda | 70 |
| 7 | ACUDA | Cassava | Uganda | 56 |
| 8 | Njule RED | Cassava | Uganda | 24 |
|  | **Total** |  |  | **398** |

In addition, the institute in collaboration with the International Institute of Tropical Agriculture (IITA), is tasked to produce a total of 1,200 *invitro* pathogen free cassava plants for hardening and establishment of seed multiplication. In this reporting period the unit has so far multiplied a total 880 plants (**Table 2B**). The delivery is targeted on 20th January 2022.

**Table 2B. List of cassava *invitro* plants to be produced and delivered to IITA as per 31st Dec. 2021**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SN** | **Genotype** | **Origin** | **Ordered** | **No. Plants produced** |
| 1 | TARICASS-2 | Tanzania | 100 | 100 |
| 2 | TARICASS-3 | Tanzania | 100 | 100 |
| 3 | TARICASS-4 | Tanzania | 100 | 100 |
| 4 | TARICASS-5 | Tanzania | 100 | 40 |
| 5 | TARICASS-1 | Tanzania | 100 | 90 |
| 6 | Kiroba | Tanzania | 100 | 100 |
| 7 | Chereko | Tanzania | 100 | 100 |
| 8 | Kipusa | Tanzania | 100 | 100 |
| 9 | Mkuranga-1 | Tanzania | 100 | 20 |
| 10 | Kizimbani | Tanzania | 100 | 40 |
| 11 | Mkumba | Tanzania | 100 | 40 |
| 12 | Pwani | Tanzania | 100 | 50 |
|  | **Total** |  | **1,200** | **880** |

**Banana**

The unit is also multiplying new banana varieties on behalf of TARI-Tengeru. A total of 70 *invitro* culture of 7 varieties (**Table 2C**) were received from UK via TARI-Tengeru, for rescuing and multiplication. So far at total of 29 plantlets have been recovered. However, 2 varieties died. Most of the received materials were in a poor state due to shipping handling, so efforts have been intensified to rescue more varieties.

**Table 2C. List of banana *invitro* plant received from TARI-Tengeru**

|  |  |  |  |
| --- | --- | --- | --- |
| **SN** | **Genotype** | **Bottle received** | **No. Plants produced** |
| 1 | NARITA-18 | 10 | 5 |
| 2 | NARITA 13 | 10 | 8 |
| 3 | NARITA 4 | 10 | 6 |
| 4 | NARITA 23 | 10 | 10 |
| 6 | TARIBAN-2 | 10 | 0 |
| 7 | TARIBAN-3 | 10 | 0 |
|  | **Total** | **70** | **29** |

**2.1.5.3 Provision of diagnostic services**

The biotech lab is currently implementing government directives to screen all the imported seeds for the presence of GMO elements prior to their distribution in the country. As of 31st December, a total of 1,330 samples of seeds received from various TOSCI branches were received and screened for presence of GMO elements. By the end of this quarter December 31st a total of 1,061 seeds have been processed (*see detailed GMO testing report*)

**Capacity building activity**

In this reporting period the lab is hosting one PhD student from UDSM for his research at TARI Mikocheni since 28th Sept. 2021.

# **Technology Dissemination and Partnership unit**

This unit serves as a link between on-station research, extension services and the farmer. It functions as subject matter specialist in disseminating research results and technical packages to the farmers through: Farmer’s Field Days Demonstration and research verification plots on farmers’ fields..

### **Organizing Training and Workshops to farmers**

The pest control unit together with their partners the association of mango growers (Amagro) and Dar es Salaam Institute of Technology (DTI) they conducted on mango fruit flies management and postharvest management techniques to Mango growers in Mkuranga district, Coast (**Table 3A)**.

**Table 3A: Technology Dissemination in between 1st October-31st December 2021**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Centre** | **No. Farmers expected to be trained** | **No.**  **farmers trained** | | **Location** | **Stakeholder origin** | **Topic/**  **technology** |
| **Male** | **Female** |
| TARI-MKN | 110 |  |  | Koga farm-Mkuranga | Mango growers, AMAGRO, Extension agents Mkuranga district, Coast | Control measures for Mango fruit flies |
| **Total** | |  | |  |  |  |

### **Identifying gaps between Research, Extension and other agricultural stakeholders**

### **Collecting news (Radio/TV programmes aired)**

In Mass media, TV programs were planned but only program TV4 aired no program aired this period

### **Participating in Agricultural related shows**

### The pest control unit participated in the annul Mango stakeholders meeting where they showcased various technology for control of mango fruit files:

### **Partnership established**

The institute is still partnering with the Pangani district executive office where they jointly run a coconut nursery for distribution to farmers

### **Visitors**

### In this quarter, the institute received a total of 30 (20 Males and 10 Females) visitors who visited to institute for agricultural consulatations

### **Number of projects documented**

In this reporting period a total of 6 projects have been going on. Six are donor-funded and 1 are government funded projects (**Table 5**)

### **Table 5: Total number of projects executed during October to December. 2021**

|  |  |  |  |
| --- | --- | --- | --- |
| **SN** | **Project title** | **Year started** | **Source of funds** |
| 1 | African Cassava Whitefly: Outbreak Causes and Sustainable Solution | 2018 | BMGF/NRI |
| 2 | Amazing Amaranth: Hardy and nutritious amaranth lines and food practices to improve nutrition in EA | 2018 | GIZ/World Vegetable Centre |
| 3 | Improving production efficiency of African Eggplant for smallholder farmers in SSA (SASSA) | 2018 | BBSRC/NIAB |
| 4 | Integrated pest management of Avocado and cucumber pest in East Africa | 2018 | ICIPE |
| 5 | Next-generation sequencing based investigation of genetic diversity and distribution of sweet potato leaf curl viruses and their effect on sweet potato in Tanzania | 2019 | COSTECH |
| 6 | Vegetable Crops IPM for East Africa | 2016 | USAID |
|  |  |  |  |

### **Table 6: Undocumented Knowledge, communication and Documentation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Media** | **Status** | **Users** | **Remarks** |
| Library | Working | Scientist | Small outdated, need librarian |
| TEEAL | Working | Offline access | Internet service is not available |
| AGORA | Journals Available | Scientists | Easily available |
| Video conferencing facilities | Working | Scientist | Internet service is not available |

# **Newsletters and Publication**

In this reporting period, 2 of new paper articles on cassava were published each on Daily news and Habari Leo news papers

# **Research technical Resources**

### As of December 31st The instate has a total of 27 research scientists in different professional levels, of which 13 are male and 14 are females as shown in table 7.

### **Table 7. Total number and category of research technical resource**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Profession** | **PhD** | | **MSc** | | **BSc** | |
| **Male** | **Female** | **Male** | **Female** | **Male** | **Female** |
| Agronomy | 1 | 1 | - | 1 | - | - |
| Plant breeding | - | - | 1 | - | - |  |
| Entomology | 0 | - | 1 | - | - | - |
| Biotechnology | - | - | 1 | - | - | 2 |
| Plant Pathology/Virology | 2 | 1 | 1 | 5 | 1 | - |
| Agricultural Engineering | - | - | 1 | - | 1 | - |
| Food Science and Nutrition | 1 | - | - | - | - | - |
| Socio/Agricultural Economics | - | - | 2 | 1 | - | - |
| Agricultural Extension and Education | - | - | - | 3 | - | - |
| **Total** | **4** | **2** | **7** | **10** | **2** | **2** |

## Human resource capacity building

### **Long Term-Training**

Three (3) students supported by different projects are continuing with their studies in various universities (**Table 8**). One of them is expected to defend her PhD on 2022.

### **Table 8: Total number of Researchers in long term training and their status by 31th December 2021**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No** | **Name** | **Sex** | **Program** | **University** | **Start Date** | **End Date** | **Sponsor** | **Remarks** |
| 1 | Vailet Mwaijande | Fe | PhD | Wagenigen, Holland | 2015 | 2019 | CIMMTY-TAMASA/BMGF | Graduating April 2022 |
| 2 | Evangelista Chiunga | Fe | PhD | JKUAT-Kenya | 2017 | 2020 | BMGF/NCSU | Writing thesis in TZ |
| 3 | Emmanuel Mrema | Fe | PhD | Accra-Ghana | 2019 | 2022 | BMGF/NextGen. | Doing research work in TZ |
|  | **Total** | **3** |  |  |  |  |  |  |

## Research Infrastructure

In this reporting period, the laboratory furniture worth USD 51,000 are still held by the custom dept. awaiting tax and duties clearance. Efforts have been stepped up by the TARI administration to seek exemption from the responsible Ministry to enable clearance. Similarly, the vital machine Realtime PCR for analysis is down thus, requires repair and software update. The arrangement for the procurement of laboratory equipment worth Tshs. 356,384,496.89 has already initiated, bidder selected and negation meeting was held on December between TARI and the bidder. The negation report and recommendation has also been submitted to TARI for decision making

* 1. **Funding**

In this reporting period TARI-MKN received funds from two main sources: government as operation charges (OC) amounting to **Tshs. 12,800,000.00** being for the month of October to December 2021**,** and from donors amounting **Tshs 24,800,000.00** (**Table 9**). In addition, in this reporting period the institute received laboratory consumables from TARI through Inqaba biotec, TZ . All the consumable were utilized for GMO testing and a completely finished

### **Table 9. Total funds received (Tshs.), their sources and expenditure for the period ending 1st October to 31st December 2021**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Type** | **OC** | **\*Donor** | **Govt./Res.** | **Sales** | **Com.**  **Levies** | **Expt.** |
| **Oct-Dec.** | 12,800,000 | 35,845,678.73 | - | 2,532,300.00 |  |  |
| **Total** | **12,800,000** | 35,845,678.73 | **-** | **2,532,300** |  |  |

# **Seed Produced (in kgs) including cuttings**

Due to prolong drought condition no sales of seedlings were done on this quarter.

# **Monitoring and Evaluation**

In this reporting period, the institute host and conducted the 3rd internal program review (IPR) meeting in collaboration with TARI Mlingano and Kibaha. The successful IPR meeting was attended by 117 scientists (57male and 60 female) from the 3 TARI and partners from Sugar Board and Sisal. A total of 18 research progress and 8 new proposal were presented and reviewed. The presented research papers have been reviewed and a draft proceeding compiled too. It is being finalized for printing and circulation.

Also TARI Mikocheni senior scientists participated in the similar IPR meeting in other institute for technical review and assistance. They are as follows:

* 1. Dr. Ruth Minja participated in TARI-Dakawa
  2. Dr. Joseph Ndunguru participated in TARI Uyole
  3. Dr. Fred Tairo participated in TARI Uyole

# **Annexes (2021)**

**Annex 1a: TARI-Mikocheni Researchers Status by Highest Qualifications**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Zones** | **Station** | **Highest qualification** | | | **Total** |
| **BSc** | **MSc** | **PhD** |  |
| Eastern | TARI-Mikocheni | 5 | 17 | 5 | **28** |

**Annex 1b: TARI Field Officers and Support Staff**

|  |  |  |
| --- | --- | --- |
| **Zones** | **Field officers** | **Support staffs** |
| **TARI-Mikocheni** | 9 | 12 |

**Annex 2: Recruited Researchers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  | | --- | --- | --- | --- | | **SN** |  |  |  | | **Name** | |  | | --- | | **Gender** | | **Designation** | **Station** |
|  | Nil |  |  |  |

**Annex 3a: Researchers Employed on Contracts and those retired**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  | | --- | --- | --- | --- | | **SN** |  |  |  | | **Name** | |  | | --- | | **Gender** | | |  |  |  | | --- | --- | --- | | **Highest Degree** |  |  | | **Discipline** | **Status** | **Station/Project** |
|  | NIL |  |  |  |  |  |

## Annex 3b: List of Researchers on Leave without Pay by Station

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **S/N** |  | | |  | | --- | | **Name** | | **Gender** | |  |  | | --- | --- | | **Higher Degree** |  | | |  |  | | --- | --- | | **Discipline** |  | | **Station** | **Current Affiliation** |
|  | Nil | **-** | **-** | **-** | **-** | **-** |

## Annex 4a: Researchers on Long-Term Training for the period by Dec. 2021

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Name** | **Sex** | **Univ.** | **Station** | **Degree/ Discipline** | **Year of Study** | **Sponsor** | **Amount of money** |
| 1 | Ms. Vailet Mwaijande | Fe | Wagengen-Holland | TARI-MKN | PhD | 2015 | CIMMTY/BMGF |  |
| 2 | Mr. Emmanuel Mrema | Ma | Accra-Ghana | TARI-MKN | PhD | 2018 | NextGen |  |
| 3 | Ms. Evangelista Chiunga | Fe | JKUAT-Kenya | TARI-MKN | PhD | 2018 | BMGF/NCSU |  |

## Annex 4b: Support Staff on Long-term Training for the period by Dec. 2021

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **S/N** |  |  | | |  | | --- | | **Name** | | |  |  | | --- | --- | | **Sex** |  | | **Research Station** | **Degree and Discipline** | **Sponsor** | **Amount of money** | **Year of Study** |
| 1. | !\*Deogratias Mark | M | TARI MKN | Biotech | Self | - | 2019 |
| 2 | \*Gladys Msofe | F | TARI-MKN | Admin | Self |  | 2019 |

## *!\*enrolled at YSDM-Tanzania*

*\*enrolled at Tumaini University-DSM*

## Annex 5: Short-term Training for Staff

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | | **S/N** |  |  | | **Course Title** | **Staff Category** | |  |  | | --- | --- | | **Number of Participants** |  | | **Duration** | **Year of Study** | **Sponsor** |
|  | NIL | - | - | - | - | - |