**TANZANIA AGRICULTURAL RESEARCH INSTITUTE**

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

**For the period of 1st July to 31th September 2022**

**Prepared by:**

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**TARI Mikocheni**

**31th September 2022**

# **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 agro-ecological 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 (1st July to 31stSeptember 2022), the institute operated four (4) research projects with financial support of which, Tshs.20,845,900.00 (69.07%) is from the international donor support while (30.93%) Tshs. 9,333,000.00is from Tanzania government through Costech.

Thus, in this quarter, using the available support, the institute recorded significant achievements in research activities by: conducting impact surveys in vegetable growing areas to assess the impact of IPM strategies, coconut mini surveys and dissemination of quality coconut seedlings to districts community nurseries for the rehabilitation of coconut cultivation, and provision of laboratory services to Seed sector through GMO testing of all imported seeds and DNA extraction service from vegetables samples for World vegetable Centre.

In line with technology dissemination , the institute also continued with the production of quality sisal, and banana and pineapple, as well as dissemination of coconut seedlings to distrcts for the rehabilitation of production

# **2.0 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. Currently, the coconut nursery is selling its 10,000 seedlings raised last year.

The planned activities in this reporting period were:

* Maintenance of coconut nursery and selling of seedlings

**Achievement**

* A total of 4,297 coconuts were harvested
* A total of 1,341 seeds were established in the seedling nursey for raising seedlings
* Completion of coconut proposal and submission to the Ministry of Finance (Treasurer) for submission to the European Union for funding.
* At Mkuranga, 21 acres for breeders test materials (BTMs II &III) for evaluation of hybrids was weeded
* Completion of ring weeding in 72 palms and174 mango trees in germplasm, respectively
* Chemical insecticide and protective fungicides was performed on 249 mango trees at Mkuranga substation

**Table 1: Quantity of Seed/seedling and coconut by product sold as of 31st September 2022**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Product**  | **Categories** | **Quantity sold** | **Price per unit** | **Total amount realised (TZS)** |
| Coconut | Cooking | 4,297 | 0.00 | 1,853,000.00 |
| Coconut  | Seedlings | 2097 | 2,500.00 | 5,312,500.00 |
| Dead coconut | Logs | 2 | 20,000.00 | 80,000.00 |
| Oil palm | Bunches | 114 | 400.00 | 45,000.00 |
| **Grand total** |  |   |   | **7,229,900 00** |

* The program continued to interacts with different partners in soliciting for funds. Two proposals were reviewed, one targeting the European Union and the other development funds.
* The proposal was completed and submitted to the treasure, who submitted to the European Union. The proposal was acknowledged and they will get back to us soon. The same proposal was submitted to TARI Hq. for endorsement and will also be submitted by the permanent secretary for Agriculture.

### **Disease control unit**

* + 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.

In this reporting period they planned to achieve the following activities:

1. to continue with project proposal writing for soliciting research funds on entomology

**Achievements**

* No activities were conducted as planned because the donor had temporarily stop disbursement until the financial report is reconciled

### **Agronomy Unit**

### The unit has been running 2 projects on horticultural crop since 2018 in collaboration with AVRDC. These projects ended officially May 2022

#### **Amazing Amaranths and Eggplant project**

In this reporting the project received 3 months extension to promote amaranths varieties and dissemination.

**Achievements**

* Signing of contract with the World vegetable Centre for 3 months extension of the previous project “Amazing Amaranthus” up to December 2022
* Raise seedling of new improved 3 varieties of African egg plants for setting promotional demonstration plots
* Site selection in 6 wards for setting demonstration plots

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

### **Table 2: Production of coconut virgin oil self-help project for the period ending 31th September 2022**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Total nuts used** | **Production costs (Tshs.)** | **Virgin oil Production (Lts.)** | **Total gross sales (Tshs.)** | **Net Profit (Tshs.)** |
| Nil |  |  |  |  |

## 2.1.6 Socio-Economic and Marketing Research Unit

The unit in this reporting period planned to achieve a number of activities as follows:

* Coordinating Centre' sales through FABU
* Data analysis of whitefly project cost benefit analysis of Mandus plus technology for cassava multipliers

**Achievement**

* Sales of the centre's products through Farm Business Unit (FABU) were well coordinated whereby total collected amount was Tshs. 9,344,400.00
1. **Marketing and value chain studies**

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

1. Second season data collection on *Mandis Plus* 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

## 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**

**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 and extended on No cost until 22nd May 2022. In this project TARI has been implementing:

1. Preparation of the final project report
2. Completing farmer field guide for recognition of tomato disease and control in swahili version “Muongozo wa Mkulima kuhusu Magonjwa yashambuliayo Nyanya na Udhibiti Wake”

**Other activities of the program include:**

1. Application of tissue culture techniques for mass propagation of pineapple and sisal seedlings
2. Provision of diagnostic services to different stakeholders

**Achievements**

**2.1.5.1 Mass propagation of Planting materials**

The unit had implemented a new project funded by the government through costech titled ‘Tissue culture-based massive production and unrestricted access to high quality pineapple planting material’ with a goal to contribute to increasing income and

**In this reporting period the planned activities were:**

1. Establish demonstration fields to train GAPs for pine apple in on station and on farm
2. Mass multiplication of pineapple seedling in tissue culture

**Achievements**

* Collection of superior germplasm for Smooth cayenne pineapple variety for mass multiplication of materials.
* A total of 108 mother stocks have been raised and multiplied to produce 21,600 seedlings.
* A total of 9253 of various crops (Pine apple, banana, cassava and sisal) have been produce, and are maintained at the growth room at TARI-Mikocheni
	+ - 1. **2.1.5.2 Provision of diagnostic services**

**Screening for customers samples**

In this reporting period the biotech lab planned to process 500 seed samples for GMO screening service. In this reporting period a total of three hundred and thirty nine (339) various seed samples from TOSCI-Northern zone (Arusha), and TOSCI-Southern Highland-(Njombe and Mtwara) were received, analysed and results submitted to TOSCI headquarter for decision making.

* + - 1. **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.

### In this quarter the unit successfully promoted and disseminated developed technologies as reported in the TTP quarter report for September 2022

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

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

 **Table 3: Broadcasted program on different media by 31st September 2022**

|  |
| --- |
| **Numbers prepared/hired/made/received** |
| **TV** | **Radio** | **Newspapers** | **Social media** | **Short Messages** | **Phone calls** | **Others specify** |
| 10 | 9 | 12 | 48 | 20 | 10 | - |

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

The institute participated in the Nane nane show both in Morogoro and Mbeya (*details in TTP quarterly report 2022*)

**Partnership established**

In the Pineapple project, a new partnership has been initiated between TARI-Mikocheni and Crop Bioscience Solution (CBS) Arusha in implementing the project. The draft MOU is being reviewed by TARI-legal officer prior to signing.

### **Visitors**

### In this quarter, the institute received a total of 51 (37 male and 14 female) visitors who visited to seek agricultural advises.

### **Number of projects documented**

In this reporting period a total of 8 projects have been going on. Seven are donor-funded and 1 are government funded projects (**Table 5**)

### **Table 4: Total number of projects executed up to 31st September 2022**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SN** | **Project title** | **Year started** | **Year ending** | **Source of funds** |
| 1 | Tissue culture-based massive production and unrestricted access of high-quality pineapple planting material | 2022 | 2023 | Govt./Costech |
| 2 | African Cassava Whitefly: Outbreak Causes and Sustainable Solution | 2018 | May 2022 | BMGF/NRI |
| 3 | Integrated pest management of Avocado and cucumber pest in East Africa | 2018 | 2022 | ICIPE |
| 4 | Vegetable Crops IPM for East Africa | 2016 | May 2022 | USAID |
| 5 | Amaranthus Amazing | 2022 | 2022 | World Veg. |

### **Table 5: 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**

Nil

# **Research technical Resources**

### **Table 6. Total number and category of research technical resource**

|  |  |  |  |
| --- | --- | --- | --- |
| **Profession** | **PhD** | **MSc** | **BSc** |
|  | **Male** | **Female** | **Male** | **Female** | **Male** | **Female** |
| Agronomy | 1 | 0 | - | 1 | 0 | 0 |
| Plant breeding | 0 | 0 | 1 | 0 | 0 | 0 |
| Entomology | 0 | - | 1 | 1 | - | - |
| Biotechnology  | 0 | 0 | 1 | 0 | 0 | 2 |
| Plant Pathology/Virology | 1 | 1 | 1 | 5 | 1 | 0 |
| Agricultural Engineering | 0 | 0 | 1 | 0 | 1 | 0 |
| Food Science and Nutrition | 0 | 0 | 0 | 0 | 0 | 0 |
| Socio/Agricultural Economics | 0 | 0 | 2 | 1 | 0 | 0 |
| Agricultural Extension and Education | 0 | 0 | 0 | 3 | 0 | 0 |
| **Total** | **2** | **1** | **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 7**). Three of them 1 of them is expected to defend her PhD on 2022.

### **Table 7: Total number of Researchers in long term training and their status by 31th September 2022**

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

## Research Infrastructure

In this reporting period, the GMO testing laboratory has received equipment and reagents for GMO testing worth Tshs. 356,384,496.89 procured by the government to strengthen the laboratory services.

* 1. **Funding**

In this reporting period TARI-MKN received funds from two main sources: government as operation charges (OC) amounting to Tshs. 9,333,000.00 and from donors amounting Tshs. 20,845,900 (**Table 9**). The available funds were utilized primarily on research activities and normal operations.

### **Table 8. Total funds received (Tshs.), their sources and expenditure for the period ending 31th September 2022**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OC** | **\*Donor** | **Govt./Res.** | **Sales** | **Com. Levies** |
| 9,333,000.00 | 20, 845,900.00 | 0.00 | 9,333,200.00 | 35,000.00 |

# ***\*IUSD-2300Tshs.***

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

Of the Tshs. 5,312,500. 00 generated in this reporting period from the selling of high-quality coconut seedlings

### **Table 9. Total amount of seed/seedlings produced and sold by 31th June 2022**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Product**  | **Categories** | **Quantity sold** | **Price per unit** | **Total amount realised (TZS)** |
| Coconut  | Seedlings | 2,097 | 2,500 | 5,312,500.00 |
| **Grand total** |  |  |  | **5,312,500.00** |

# **Monitoring and Evaluation**

In this reporting period, no monitoring and evaluation exercise was conducted due to COVID 19 pandemic, there was restricted movement.

# **Annexes (2022)**

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Zones** | **Station** | **Highest qualification** | **Total** |
| **BSc** | **MSc** | **PhD** |  |
| Eastern | TARI-Mikocheni | 4 | 17 | 3 | **24** |

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

|  |  |  |
| --- | --- | --- |
| **Zones** | **Field officers** | **Support staffs** |
| **TARI-Mikocheni** | 10 | 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** |
| 1 | Nil |  |  |  |  |  |
| 2 |  |  |  |  |  |  |

## 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 June 2022

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Name** | **Sex** | **Univ.** | **Station** | **Degree/ Discipline** | **Year of Study** | **Sponsor** |
| 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 JuneJune . 2022

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |
| --- | --- | --- |
| **S/N**  |  |  |

 |

|  |
| --- |
| **Name**  |

 |

|  |  |
| --- | --- |
| **Sex** |  |

 | **Research Station** | **Degree and Discipline** | **Sponsor**  | **Amount of money** | **Year of Study** |
| 1. | NIL | - | - | - | - | - | - |

## Annex 5: Short-term Training for Staff

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Course Title** | **Staff Category** |

|  |  |
| --- | --- |
| **Number of Participants**  |  |

 | **Duration** | **Year of Study** | **Sponsor** |
|  | Nil |  |  |  |  |  |