

# TANZANIA AGRICULTURAL RESEARCH INSTITUTE



## Quarterly Report on Research, Management and Coordination Progress

**For the period of 1<sup>st</sup> January to 31<sup>th</sup> March 2023**

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**31<sup>th</sup> March 2023**

## Abbreviations and Acronyms

AVRDC	African vegetable research and development centre
BMGF	Bill & Melinda Gates Foundation
BBSRC	Biotechnology and biological sciences research council
CIMMYT	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 S6.52<sup>0</sup> and longitude E 38.91<sup>0</sup>, while Mkuranga sub-station is located at S 7.12<sup>0</sup> and longitude E 39.20<sup>0</sup>, 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), Biological sciences research council (BBSRC), World Vegetable and Centre and International Centre for Insect Physiology and Entomology (*Icipe*). In this quarter third (3) starting from 1<sup>st</sup> January to 31<sup>st</sup> March 2023, the institute operated four (6) research projects with financial support of Tshs. 160,334,114 (63.1%) is from the International donor support while 64,850,000 (25.5%) is from Tanzania government as operational costs.

Thus, using the available support, the institute recorded significant achievements in its planned research activities in this quarter on:

- i) mass multiplication of sisal seedlings and pineapple
- ii) weeding and harvesting of coconut from seed farms,
- iii) planting cassava for clonal evaluations trials for ACWP-2 project
- iv) fertilizer evaluation trials for efficacy determination
- v) DNA finger printing and illegitimacy testing of oil palm seedlings
- vi) Impact evaluation surveys on newly promoted amaranths and eggplants in four districts in Coast and Dar es salaam regions

In line with research activities, the institute also continued processing of and production of virgin coconut oil and selling of coconut seedlings and coconuts for domestic use.

## 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 and mango orchards. Currently, the coconut nursery has sold over 437 seedlings as part of 758 seedlings raised last year.

The planned activities in this reporting period were:

1. Maintenance of coconut nursery and selling of seedlings
2. Weeding and harvesting of coconut from its seed farms

#### Achievement

1. A total of 758 seedlings were established in the seedling nursey for raising seedlings
2. A total of 500 have been prepared for establishment of nursery at Agricultural hubs in Morogoro 300 and 200 in John Mwakangale ground in Mbeya
3. A total of 2,726 coconuts were harvested and will be sold for for domestic use at Farm get price of Tsh. 500 each

**Table 1: Quantity of Seed/seedling and coconut by product sold as of 31<sup>st</sup> Marchi 2022**

Product	Categories	Quantity sold	Price per unit	Total amount realised (TZS)
Coconut	Cooking	0	0	0
Coconut	Seedlings	437	2500	1,092,500.00
Dead coconut	Logs	0		
Oil palm	Bunches	0		
<b>Grand total</b>		<b>0</b>	<b>0</b>	<b>1,092,500.00</b>

#### 2.1.1 Disease control unit

#### 2.1.2 Pest control unit

In this reporting period the unit planned to achieve the following activity:

1. to continue with project proposal writing on "the management of Bole rot disease of sisal is being finalised for soliciting research funds
2. conducted field survey of arthropods pests, pollinators and natural enemies on tomato and cucurbits in Morogoro region

### **Achievements**

- One survey on cucurbits arthropods conducted on xxx districts in Morogoro. Data are being processed for technical report writing

### **2.1.3 Agronomy Unit**

The unit has been running 2 projects on horticultural crop since 2018 in collaboration with AVRDC and World vegetable center. These projects ended officially May 2022 but receive extension up to December 2022 with overlap up to 31<sup>st</sup> March 2023 to accomplish the planned activities

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

In this reporting the project received overlap extension up to March 2023 to promote amaranths varieties and dissemination.

### **Achievements**

1. Conducted farmers field day (FFD) in four sites and disseminating seeds of new varieties of 3 amaranths, 2 eggplants and 1-night shade to each participant in the FFD (vegetable seed kits were given to 451 vegetable farmers)
2. Conducted impact survey

## Post-harvest technologies unit (PHT)

The unit continue with extraction, packaging and selling of virgin coconut oil from the institution coconut orchard.

### Planned activities in this quarter were:

1. Renovation of the oil processing building and machine for oil extraction
2. Extraction and selling VCO
3. Application of standard from Tanzania Bereau of standard (TBS) for virgin coconut oil produced

### Achievements

1. Extraction of and packaging of VCO continued and the amount produced so far a total of 14.5 liters of oil processed **Table 2**

**Table 2: Production of coconut virgin oil self-help project for the period ending 31<sup>th</sup> March 2023**

Total nuts used	Production costs (Tshs.)	Virgin oil Production (Lts.)	Total gross sales (Tshs.)	Net Profit (Tshs.)
660		14.5	580,000	

*\*Selling of the VCO still continued the net profit will be known after the sale*

### 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

#### Achievement

- Sales of the centre's products through Farm Business Unit (FABU) were well coordinated whereby total collected amount was Tshs. 1,670,250.00
- Preparation of the budget estimates for the period of 2023/202
- Marketing and value chain studies

### 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:

#### 2.1.7.1 Molecular entomology

##### 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

### 2.1.7.1 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 pineapple in on farm at Madeke and Kinole villages in Njombe and Morogoro regions
2. Mass multiplication of pineapple MD-2 variety seedlings in tissue culture
3. Conducting illegitimacy screening on hybrid oil palm seedlings to determine level of contamination in crossing program for tenera seedlings

## Achievements

- Two on farm demonstration filed of 1 acre established each with a total of 9,500 seedlings in Kinole and Madeke villages in Njombe and Morogoro regions, respectively
- A total of 42,367 of MD-2 Pine apple seedlings have been produced, and are maintained in the growth room at TARI-Mikocheni
- 4,000 leaf samples from TARI-Kihinga and associated stakeholders collected, and DNA is being extracted in the lab. Results will be available after three weeks

## 2.2 Technology Transfer and Partnership Unit (TTP)

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: Demonstration plots, AgriTech hubs and Farmer's Field Days.

### 2.2. 1 Demonstration plots established by TARI Centre

In this reporting time the total number of 5 demonstration plots are maintained; one each in Chambezi and Malolo sites for evaluation of efficacy of fertilizer in crop improvement, and 3 for pineapple promotion of hybrid variety MD2 each in Kinole Morogoro, Chambezi-Bagamoyo and Madeke-Njombe

### Table 3: Farmers who visited TARI AgriTech hubs

A total of 682 stakeholders 114 during farmer's field days, 300 in AgricHubs, 126 direct visit to TARI-Mikocheni headquarter and 142 direct visits to sub stations in Chambezi and Mkuranga, respectively

### 2.1.8 Collecting news (Radio/TV programs aired)

In this quarter the unit has successful aired one (1) Radio and one TV programs broadcasted on technologies of coconuts and articles in four (4) news papers.

### 2.1.8 Participating in Farmers Field Days(FFDs)

Nil

### 2.1.9 Partnership and collaboration established

The institute signed memorandum of understanding with Tanzania Fertilizer Regulatory Authority (TFRA). Currently, we are evaluating the efficacy of fertilizer in crop production at Chambezi and Malolo trial site Dar es Salaam on behalf of TFRA

### Visitors

In this quarter, the institute received a total of 171 farmers (121) Males and 50 Females) visited the centre for different agriculture consultations

### Number of projects documented

In this reporting period a total of 8 projects have been going on. Four are donor-funded and 3 are government funded projects (**Table 4**).

**Table 4: Total number of projects executed up to 31<sup>st</sup> March 2023**

S N	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 (ACWP-2)	2018	*2023	BMGF/NRI
3	Integrated pest management of Avocado and cucumber pest in East Africa (CAPS)	2018	2023	ICIPE
5	Amaranths Amazing	2022	2023	World Veg.
6	Cassava Mosaic Disease Susceptibility and Resistance (CMD-II)	2018	2024	NCSU/BMGF
7	Massive multiplication of Sisal planting materials using tissue culture technology	2023	2023	Govt/TARI-Mlingano
8	Oilplam DNA dingerprinting and illegitimacy testing to Tenera seedlings	2023	2023	Govt/TARI-Kihinga

\* ACWP-2 has been granted one-year extension

## 3 Newsletters and Publication

Nil

## 4 Research technical Resources

**Table 5. Total number and category of research technical resource by 31<sup>st</sup> March 2023**

Profession	PhD		MSc		BSc	
	Male	Female	Male	Female	Male	Female
Agronomy	1			2	0	0
Plant breeding	0	0	1	0	0	0
Entomology	0	0	1	1	0	0
Biotechnology	0	0	1	6	2	10
Plant Pathology/Virology	1	1	0	0	0	0



Agricultural Engineering	0	0	0	0	1	0
Food Science and Nutrition	0	0	0	0	0	0
Socio/Agricultural Economics	0	0	2	0	0	0
Agricultural Extension and Education	0	0	0	2	0	0
<b>Total</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>11</b>	<b>3</b>	<b>10</b>

## 4.1 Human resource capacity building

### 4.1.7 Long Term-Training

Five (5) students supported by different projects are continuing with their studies in various universities (**Table 6**). One of them is expected to defend her PhD on 2023.

**Table 6: Total number of Researchers in long term training and their status by 31<sup>th</sup> March 2023**

No	Name	Sex	Program	University	Start Date	End Date	Sponsor	Remarks
1	Vaiet Mwaijande	Fe	PhD	Wagengen, Holland	2015	2023	CIMMTY-TAMASA/BMGF	Graduating April 2023
2	Evangelista Chiunga	Fe	PhD	NCSU-USA	2017	2023	BMGF/NC SU	Writing thesis in TZ
3	Emmanuel Mrema	Fe	PhD	Accra-Ghana	2019	2024	BMGF/Next Gen.	Doing research work in TZ
4	Ahazi Mikhloth	Me	BSc	SUA-TZ	2022	2026	GOT/Self	ongoing
5	Fadhil Fadhili	Me	BSc	Uganda	2022	2026	GOT/Self	ongoing
<b>Total</b>		<b>3</b>						

## 4.2 Research Infrastructure

In this reporting period, the GMO testing laboratory has finally received all equipment and reagents for GMO testing worth Tshs. 356,384,496.89 procured by the government to strengthen the laboratory services. At present about 99% of the ordered goods have been received.

### Funding

In this reporting period TARI-MKN received funds from two main sources: government as operation charges (OC) amounting to Tshs. 253,992,725 and from donors amounting Tshs. 160,334,114 (**Table 6**). The available funds were utilized primarily on research activities and normal operations.

**Table 6. Total funds received (Tshs.), their sources and expenditure for the period ending 31<sup>th</sup> March 2023**

OC	*Donor	Govt./Res.	Sales	Com. Levies
18,823,000	160,334,114	00	74,835,611	00

*\*USD-2300Tshs.*

### Seed Produced (in Kgs) including cuttings

Of the Tshs. xxx generated in this reporting period from the selling of high-quality coconut seedlings

**Table 9. Total amount of seed/seedlings produced and sold by 31<sup>th</sup> March 2023**

Product	Categories	Quantity sold	Price per unit	Total amount realised (TZS)
Coconut	Seedlings	437	2500	1,092,500.00
<b>Grand total</b>				<b>1,092,500.00</b>

## 5 Monitoring and Evaluation

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

### 6. Challenges and their mitigation by 31<sup>st</sup> March 2023

2. Land enroachment in Chambezi germplasm and seed farm block. Despite the step up efforts by the TARI-MKN with assistance from TARI's legal officer, still the future for the said farm is uncertain, this completely disrupt the institute coconut replanting plans
3. Absence of tractor in Chambezi substation has hindered weeding activities in the coconut farms. The available tractor is beyond repair.
4. Guards in the coconut farms in both Chambezi and Mkuranga.

## 6 Annexes (2023)

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

Zones	Station	Highest qualification			Total
		BSc	MSc	PhD	
Eastern	TARI-Mikocheni	13	13	3	29

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

Zones	Field officers	Support staffs
TARI-Mikocheni	12	12

### Annex 2: Recruited Researchers by 31<sup>st</sup> March 2023

SN	Name	Gender	Designation	Station
1	Suzana Theonest Theonest	Female	Research Assistant	TARI-Mikocheni
2	Sylvia Adam Milemba	Female	Research Assistant	TARI-Mikocheni
3	Rahma Chaboba Mkwangwa	Female	Research Assistant	TARI-Mikocheni
4	Ndumile Elinisa Kimaro	Female	Research Assistant	TARI-Mikocheni

### Annex 3a: Researchers Employed on Contracts by 31<sup>st</sup> March 2023

SN	Name	Gender	Highest Degree	Discipline	Status	Project
1.	Mapambano Kisendi	Male	Form Four	Driver	In Service	CMD-II

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

S/N	Name	Gender	Higher D	Discipline	Station	Current Affiliation
	Nil	-	-	-	-	-

### Annex 4a: Researchers on Long-Term Training by 31<sup>st</sup> March 2023

SN	Name	Sex	Univ.	Station	Degree/ Discipline	Year of Study	Sponsor
1	Ms. Vailet Mwajjande	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
4	Ahazi Mikhloth	Me	SUA-TZ	TARI-MKN	BSc	2022	GOT/Self
5	Fadhil Fadhili	Me	Uganda	TARI-MKN	BSc	2022	GOT/Self

### Annex 4b: Support Staff on Long-term Training for the period by 31<sup>st</sup> March 2023

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
1						

