**TANZANIA AGRICULTURAL RESEARCH INSTITUTE**



**4th Quarter Progress Report from 1st APRIL– 31st JUNE 2022**

**Technology Transfer and Partnership - TARI Mikocheni**

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**1.0 Introduction**

Tanzania Agricultural Research Institute-(TARI-Mikocheni) is one of the 17 research centres under TARI. 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 its mandates are: coconut and biotechnology. The coconut program is the main with four (4) research units which include: agronomy, disease control, pest control, social economy, post-harvest and technology transfer, the biotechnology program accommodate three (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 cut across all crops and supports other research mandate.

1. **Technology Dissemination pathways used by TARI**

Various pathways were used for dissemination of agricultural technologies from research to different stakeholders which include fairs, field days, demonstration plots, information education and communication materials, mass media and use of hubs (AgriTeCH).

**2.1 Agricultural Technology Transfer Hub (AgriTec)**

**2.1.1: Farmers visited Agricultural Technology Transfer Hubs (AgriTecH)**

**Table 1: Farmers who visited TARI AgriTecH hubs**

|  |  |  |
| --- | --- | --- |
| **AgriTecH Hub** | **Farmers** | **Total** |
| **Male** | **Female** |
| Nzuguni, Dodoma | 19 | 3 | 22 |
| Fatma Mwasa, Tabora | 150 | 12 | 162 |
| Mwl. Julius Nyerere, Morogoro | 114 | 76 | 190 |
| **TOTAL** | **283** | **91** | **374** |

**2.1.2 Demonstration plots planned and established**

AtNzuguni- Dodoma and Fatuma Mwasa-Tabora demonstration plots established were coconut plants intercropping with leguminous crops. Demonstration plots were also established at Mwalimu Julius Nyerere-Morogoro which included the following crops Coconut, Oranges, Mangoes, Banana tissue culture and Coconut nursery.

**Table 2: Number of Demo plots, type of crops and varieties planted by TARI**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Hubs** | **Planned number of demo plots** | **No. demo plots planted** | **Crops** | **Variety/ technologies** |
| Nzuguni-Dodoma | 1 | 1 | Coconut | Intercropping with leguminous crop |
| Fatma Mwasa-Tabora | 1 | 1 | Coconut | Intercropping with leguminous crops |
| Mwalimu Julius Nyerere- Morogoro | 3 | 3 | 1. Coconut, Oranges, Mangoes,2. Banana tissue culture3.Coconut nursery | 1. Intercropping coconut plants with leguminous crops in order to increase nitrogen fixation2.Clean seed variety3.East African Tall Variety resistant to diseases |
| **TOTAL** | **5** | **5** |  |  |

**2.1.3: Disseminated planting materials through AgriTecHub(s)**

The centre planned to disseminate 100 plantlets from tissue culture laboratory but 16 suckers were planted at Morogoro Agricultural hub and the varieties were Mzuzu, Malindi, Bukoba and Fia 23. Also 300 East African Tall variety of coconut nursery seedlings were established.

**Table 3: Dissemination of planting materials through AgriTecH(s) by TARI**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name of Agri.TecH** | **Type of planting material** | **Crops Varieties** | **No. Planned Propagated planting materials**  | **No. of Disseminated planting materials** |
| Mwl. Julius Nyerere, Morogoro | Suckers | Banana tissue culture | 100 | 16 suckers (4-Mzuzu, 4-Kimalindi, 4-Bukoba and 4-Fia 23) |
|  | Coconut nursery seedling | East African Tall Varieties | 6,000 | 1,150 |

**2.1.3: Demo plots established and technologies disseminated through AgriTecH**

The total numbers of demonstration plots established and technologies disseminated through AgricTech were five (5) where by one (1) demo plot at Nzuguni-Dodoma which is Coconut intercropped with leguminous crop, 1 demo plot at Fatma Mwasa-Tabora Coconut intercropped with leguminous crop, three (3) demo plots at Mwalimu Julius Nyerere-Morogoro one (1) demo plot on Banana tissue culture two (2) Coconuts intercropped with mangoes and oranges, three (3) Coconut nursery seedling.

**Table 4: Demonstration plots established and technologies disseminated by TARI through AgriTecH(s)**

|  |  |  |
| --- | --- | --- |
| **AgriTecH** | **Crop** | **Variety/technology disseminated** |
| Nzuguni, Dodoma | 1. demo plot | Coconut intercropping with leguminous crop |
| **Total No. technologies disseminated** | 1 |
| Fatma Mwasa, Tabora | 1. demo plot | Coconut intercropping with leguminous crop |
| **Total No. technologies disseminated** | 1 |
| Mwl. Julius Nyerere, Morogoro | 1. Banana tissue culture | Clean banana tissue culture |
| 2. Coconuts Mangoes oranges | Intercropping with leguminous crops |
| 3 Coconut nursery seedling | Resistant coconut nursery seedlings |
| **Total No. technologies disseminated** | **3** |
| **TOTAL** | **Total No. technologies disseminated** | **5** |

**2.2 Demonstration plots established by TARI Centres**

The total number of 17 demonstration plots on improved cassava varieties managed by TARI Mikocheni Centre were established.

**Table 5: Number of Demonstration plots established and technologies disseminated by TARI Mikocheni**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Centres** | **Crop** | **Planned No.** | **No. plots established** | **Technologies disseminated** |
| Mikocheni  | Pineapple  |  | 2-Plots On Station at Chambezi Sub Station1 On farm at Fukayosi Ward-Bagamoyo | Showcasing farmers the use of good agronomic practices for pineapple production and use of quality planting materials from tissue culture laboratory  |
| **Total** |  |  | **2 plots** |  |

**2.3 Farmers’ Field day executed by TARI**

During the reporting time, the centre planned to conduct one Farmer Field Day to show case Good Agronomic Practices (GAPs) for coconut and crops from tissue culture however due to insufficient funds this activity was not done.

**2.4 Training and number of stakeholders and University Students**

2.4.1 Total numbers of stakeholder trained about: Improving production efficiency of African Eggplant (*Solanum aethiopicum*) for smallholder farmers in sub-Saharan Africa were 34 (22 Males and 12 Females) from five Coastal Districts. The districts are among our important stakeholders that we work and collaborate in our activities.

The total number of 31 (19 Males and 12 Females) students from University of Dar es Salaam were trained about Molecular biology.

**Table 6: Type of Trainings and number of stakeholders trained by TARI**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Type** | **Date** | **Method** | **Theme/****topic** | **Location** | **Planned Numbers** | **Total** |
| **Male** | **Female** |  |
| TOT | 14th June 2022 | group | Improving production efficiency of African Eggplant (*Solanum aethiopicum*) for smallholder farmers in sub-Saharan Africa | TARI Mikocheni | 22 | 12 | 34 |
| Farmer  |  |  | Pineapple Project Inception Meeting  |  | 1 |  | 1 |
| Researchers |  |  | Pineapple Project Inception Meeting |  | 7 | 7 | 14 |
| Field officers and DAICO |  |  | Pineapple Project Inception Meeting |  | 4 | 1 | 5 |
| Student |  | Group | Molecular biology | UDSM | 19 | 12 | 31 |
| **Total** |  |  |  |  | **53** | **32** | **85** |

**2.5 Stakeholders reached with improved technologies disseminated by TARI Mikocheni**

Under African Cassava Whitefly project, a total numbers of 17 demo- plots and 12 demo-plots - on farm at Mkuranga, Chambezi, Tanga and Mwanza with improved technologies were reached by different stakeholders. *Mandiplus* seed treatment technology was disseminated while on station 5 improved cassava varieties demo-plots were disseminated at Mkuranga and Chambezi.

Tanzania Agricultural Research Institute centres including TARI Mikocheni participated in the National Competition on Science, Technology and Innovation (MAKISATU) exhibition for the year 2022 which was held in Dodoma. Exhibitions are one among other pathways to disseminate different technologies developed by researchers to various agricultural research stakeholders. In this exhibition a total number of 637 (404 Male and 233 Female) visited TARI pavilion to ask for different technologies as shown in Table 7. Along with the MAKISATU exhibition Mikocheni was among other agricultural and non-agricultural institutions participated and witnesses the handling of the motorcycles to the country Agricultural Extension Officer which was done by The President of the United Republic Tanzania Her Excellency Samia Suluhu Hassan in Dodoma accompanied by the high levels government officials in presence of the Minister of Agriculture Hon. Hussein Bashe.

The centre also participated in the distribution of a total of 450 improved coconut seedlings in Mkuranga, Lindi, Mtwara and Same. Despite of the distribution, the team planted the seedlings together with the stakeholders in the visited areas. Awareness creation, capacity building on coconut production was done.

**Table 7: Stakeholders reached with improved technologies disseminated**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Method** | **Farmers** | **Ext. staff** | **Other stakeholders** | **Location** | **Crop/technology disseminated** |
| Hubs |  |  |  |  |  |
| Demos | Total 1912-On farm |  |  | Mkuranga, Chambezi, Tanga and Mwanza | *Mandiplus* seed treatment technology |
| 5-On station |  |  | Mkuranga and Chambezi | Improved cassava varieties |
| 1-Plot On Station |  | 4 | Chambezi Sub Station | Showcasing farmers on the use of pineapple planting materials produced from tissue culture laboratory |
| 1-Plot Plot On Station |  | 6 | Fukayosi Ward  | Showcasing farmers on the use of pineapple planting materials produced from tissue culture laboratory |
| Exhibitions  | Stakeholders visited TARI Pavilion were 637 of which 404 were Males and 233 Females |  | 637 | MAKISATU-Dodoma  | Management of Coconut seedling, Good Agronomic Practices for coconut production, intercropping practices, Value Addition activities like production of Virgin coconut oil |
| Meetings | 6 (3 Male 3 Female) |  |  | Mikocheni | Improve cassava varieties |

**Commercialization of Products**

**3.1 Product development and Certification**

**Table 8: Commercialized products by centre**

|  |  |  |
| --- | --- | --- |
| **Commodity** | **Product developed** | **Certification details** |
| Coconut | Virgin Coconut Oil | It is on Processing |

**4.0 Farm and Business Unit (FABU)**

**4.1 Seed production**

During reporting time, TARI Mikocheni planned to develop 1/2 acre nurseries seedling instead ¼ of an acre nurseries was developed in both Chambezi and Mkuranga Farms and had about 6000 seedlings.

**Table 9: Acres for Seed Production**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Centre** | **Type of****Crop** | **Planned target(acres)** | **Area planted to date(acres)** | **No of seedlings planted** |
| Mikocheni | Coconut | ½ | ¼ acre | 6000 |
| **Total** |  |  |  | **6,000** |

**4.2 Amount of seed, seedling and added value products produced/prepared**

Application of tissue culture techniques for mass propagation of different crop such as banana, sweet potato, pineapple and cassava initiated (1,000 at Mlingano) and 200 at Mikocheni. These two culture activities is a project with an object to produce 6,000 seedlings after 5 cycles.

* 1. **Income generated from sell of seed/planting materials**

Farm Business is a unit which is responsible for supervising production and marketing of products produced by the centre. During April to June 2022 FABU obtained income of **TZS** **4,334,800/=** from the following products as shown on Table 11.

**Table 11: Quantity of Seed/seedling/cuttings/value added products sold**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Products sold** | **Quantity sold** | **Unit FGP** | **Total amount realised** | **Cumulative total** | **Source** |
| APRIL, 2022 | Coconuts | 1479 | 500 | 739,500 |  | Chambezi |
| APRIL, 2022 | Coconut seeds | 100 | 1000 | 100,000 |  | Chambezi |
| APRIL, 2022 | **TOTAL** | **1579** |  | **839,500** |  | Chambezi |
| APRIL, 2022 | Oil palm bunches | 152 | 400 | 60,800 |  | Chambezi |
| APRIL, 2022 | Coconut seedlings | 968 | 2500 | **2,420,000** |  | Chambezi and Mkuranga |
| APRIL, 2022 | Dead coconut logs | 3 | 20,000 | 60,000 |  | Chambezi |
| APRIL, 2022 | **House Rent** |  |   | 115,000 | 115,000 | Chambezi |
|   | **TOTAL INCOME FOR APRIL 2022** | **4,334,800** |  |  |

**4.4** **Income generated from other sources**

TARI Mikocheni earned Income generated by hire and rental services from the houses at Chambezi farm about **TZS 115,000/=**

**Table 12:Income generated by Centres from other sources between April to June 2022**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source of Income** | **No.** | **Price/unit** | **Costs of production variable cost** | **Value (TZS)** | **Remarks** |
| Hire and rental services | 1 |  |  | 115,000 |  |
| **Total**  |  |  |  | **115,000** |  |

**Knowledge Management and communication**

**4.1 TARI Website Content Management**

Different information were uploaded to TARI website as shown by the Table 13:

**Table 13: Type and numbers of information uploaded to TARI website for the quarter**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Centre** | **Type of information uploaded** | **Number/****frequency** | **Remarks/any feedback** | **Challenges** |
|  | Publications | 28 | Different documents | There are other documents cannot be uploaded in the website due to their size. Internet connectivity and technical know-how and the importance of the use of website is not very clear to some of the staff |
| Images/photos | 3 | Different activities |
| Videos | 5 |  |

**4.2 Information education and communication materials**

Planned number of materials to be disseminated were 1,800 leaflets on coconut and tissue culture, 1 banner on coconut which are all still under preparation process. During the reporting time, the Centre managed to develop article in *Uhuru ya Kijani* special magazine during the congregation of our country. The articles showcased the centre activities and visibility of the researchers. The major titles were: The success of TARI Mikocheni which included the contribution of research activities in increasing coconut production along the value chain in the country. Other titles were about biotechnology which includes tissue culture and laboratory activities in technology developing to be disseminated to different stakeholders.

**5 TARI Visibility**

**5.1 Signboards**

Preparation of signboards: areas fixed with signboards with uniform format and design across TARI Centres

**5.2 Mass media prepared**

In this reporting period, the centre planned to air 15 television programs while aired were 10 television programs. Also the plan was to have 15 radio programs but 9 radio programs were aired. The plan was 20 newspapers articles but actual released newspaper articles were 12. The plan was to have 65 social media while aired were 48 as shown on the Table 14.

**Table 14: Number of TVs, radio, newspapers and social media produced and disseminated**

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

* 1. **Publications**

Two scientific papers were published into peer reviewed journals:

1. Bachwenkizi H.S., Temu G.E., **Mbanzibwa D.R.** Lupembe M.D., Ngailo S., **Tairo F.D** and Deogracious Protas Massawe D.P (2022). Recombination and darwinian selection as drivers of genetic diversity and evolution of sweet potato leaf curl viruses in Tanzania Physiological and Molecular Plant Pathology 120 (2022) 101853
2. Bachwenkizi H.S., Temu G.E., Lupembe M.D., Ngailo S., **Tairo F.D** and **Mbanzibwa D.R.** (2022). Development of molecular-based detection tool for sweet potato leaf curl viruses and determination of their incidence levels in Tanzania. African crop science journal doi: <https://dx.doi.org/10.4314/acsj.v30i3.8>

**6.0 Strengthening Partnerships and Collaboration**

The Partnership in reported time was from different stakeholders including District Council Officers and other farmers in dissemination of coconut nursery seedling at Pangani, Bagamoyo, Mkuranga and Gairo; Partners from Tanzania Support Programme, Tanzania Living Green Limited and Extractive Inter Stakeholders Forum- work together in coconut production activities in the country specifically in awareness creation, capacity building and data management; Individual Farmers, processors, government agencies, commodity groups, environmental team, Professionals like Health Doctors, researchers from other centres and other institutions- strengthening the capacity in coconut production along the value chain. In order to increase and strengthening partnership, 24th June 2022, Epoch Agriculture Development Limited from China accompanied by the Tanzania Iinternational Institute of Tropical Agriculture (**IITA**) team came to visit the centre in order to partner in production of clean cassava planting materials through tissue culture and other research activities at the centre.

**6.1 Meetings / conferences / symposia / workshops**

In African cassava whitefly meeting was done at TARI Mikocheni on 3rd June 2022 of which 6 (3 Males and 3 Females) researchers participated which its main objective was to access the project progress and plan monthly activities. Two Female researchers attended the Kick-Off Knowledge Management for Agricultural Development Challenge 2022.

**Table 15: Meetings/conferences/symposia/workshops conducted/ attended by TARI staff**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No** | **Tittle/themes** | **Dates** | **Venue** | **Partners** | **Type of event(workshop/Meeting** |
| 1 | Resistant African cassava whitefly | 3rd June 2022 | TARI Mikocheni | Researchers from TARI Mikocheni and TARI Kibaha  | It was a meeting on assessing the project progress and planning for the coming activities |
| 2 | Kick-Off Knowledge Management for Agricultural Development Challenge 2022 | 10th June 2022 | Webinar  | FARA, CCRDESA, ASARECA, IFAD, K4DV, AFAAS and CORAF | It was a meeting on pushing forward the knowledge agenda in the continent  |

**6.2 Visitations**

Total number of 51 (37 Males and 14 Females) stakeholders visited the centre for different purposes as shown in **Table 16**

**Table 16:** **Visitors visited the centre**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/No** | **Centre** | **Date of the visit** | **Type of visitors** | **Total number** | **Aim of the visit** |
| 1. | Mikocheni | April, May and June in different dates | Individual Farmers, processors, government agencies, commodity groups, environmental team, Professionals like Health Doctors, researchers from other centres and other institutions  | 45(33Male Female 12) | To ask and learn about coconut production along the value chain technologies most of the stakeholders ask about how to start coconut farming, when, where to get the seedlings, best coconut varieties. Most of individuals ask about the importance of coconut virgin oil and more curious on it effectiveness in medical issues. The demand of coconut virgin oil is high.  |
|  |  | 6th June 2022 | Partners from Tanzania Support Programme, Tanzania Living Green Limited and Extractive Inter Stakeholders Forum | 3(2 Males and 1 Female) | Discussion about how we the four partners can work together in coconut production activities in the country specifically in awareness creation, capacity building and data management  |
|  |  | 15th June 2022 | Publication Company  | 1Male  | To discuss on how his company can work with the centre on publication of our activities and he insisted to work with us on the coming events of International Trade Fair and Agricultural Show  |
|  |  | 28th June 2022 | Farmers | 2(I Male and 1 Female) | Coconut production along the value chain especially they wanted to know about the varieties suitable in the country. They were also interested to know about cashew nut, banana and onion production: background information about the crops were provided to them and in addition the contacts to the centres with the mandate of the crops were provided |

**6.3 Internship Programmes**

TARI Mikocheni received two (1 Male and 1 Female) interns from Sokoine University of Agriculture University (SUA).

**Table 17: Number of intern attached to the centre**

|  |  |  |  |
| --- | --- | --- | --- |
| **Centre**  | **Type** | **From** | **Number** |
| Mikocheni working in Agronomy Unit | Students | SUA University | 2 |

**6.4 Challenges**

* Financial support for preparation and maintaining of Agricultural Hub which operates throughout the year
* In order to conduct Farmers Field Days activities funds are needed short of that the activities cannot be done
* Lack of funds for virgin coconut oil processing, these include lack of funds for rehabilitation of the processing premises
* Financial constraints limit coconut technology promotion and dissemination activities including preparation of dissemination materials like leaflets, brochures, banners and production of TV and Radio programs.
* Limited vehicles for field activities and other supplies
* Difficult to solicit funds from donors as the crop (coconut) takes about 7 years to start bearing nuts. It takes several years to see the impact of the investment so most donors are less interested on investing in coconut production
* A number of scientists’ with knowledge in coconut have already retired and others are about to retire

**6.5 Conclusion and Recommendations**

* Improved Coconut technologies have been developed, tested and proven to increase farmer’s income and food security which are ready to be promoted and disseminated to farmers and other stakeholders hence efforts to accomplish these activities is needed
* Coconut is an important oil crop and farmers in the coastal belt depend on it for their livelihood. Products from coconut are needed and the demand is high like the use of Virgin Coconut Oil (VCO) has received attention by the community due to its health benefits. Therefore there is high demand for VCO.