



**Tanzania Industrial Research and
Development Organization (TIRDO)**



**THE 19th MEETING OF COMSATS
COORDINATING COUNCIL
(17th – 18th May 2016, Islamabad, Pakistan)**

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1. INTRODUCTION

- The Tanzania Industrial Research and Development Organization (TIRDO) is a multi-disciplinary research and development organization established by an Act of Parliament No. 5 of 1979 and it became operational on 1st April, 1979.
- TIRDO is a semi autonomous organization under the Ministry of Industry, Trade and Investment



1.1 Mission

- To conduct research, development and technical services on industrial processes and products, while utilizing local materials in partnership with industries



1.2 CORE FUNCTIONS

- To carry out research in various aspects of local and foreign industrial techniques and technologies and evaluate their suitability for adaptation and alternative use in local industrial production.
- To provide to the firms engaged in industrial production advisory technical services so as to improve performance and to avert or minimize the sources of industrial pollution

1.3 STAFF PROFILE

TIRDO has 85 workers including 35 Researchers (scientists, engineers), 17 technicians and the rest consist of administrative personnel.

PhD 12 (4 Studies); MSc 15 (2 Studies)

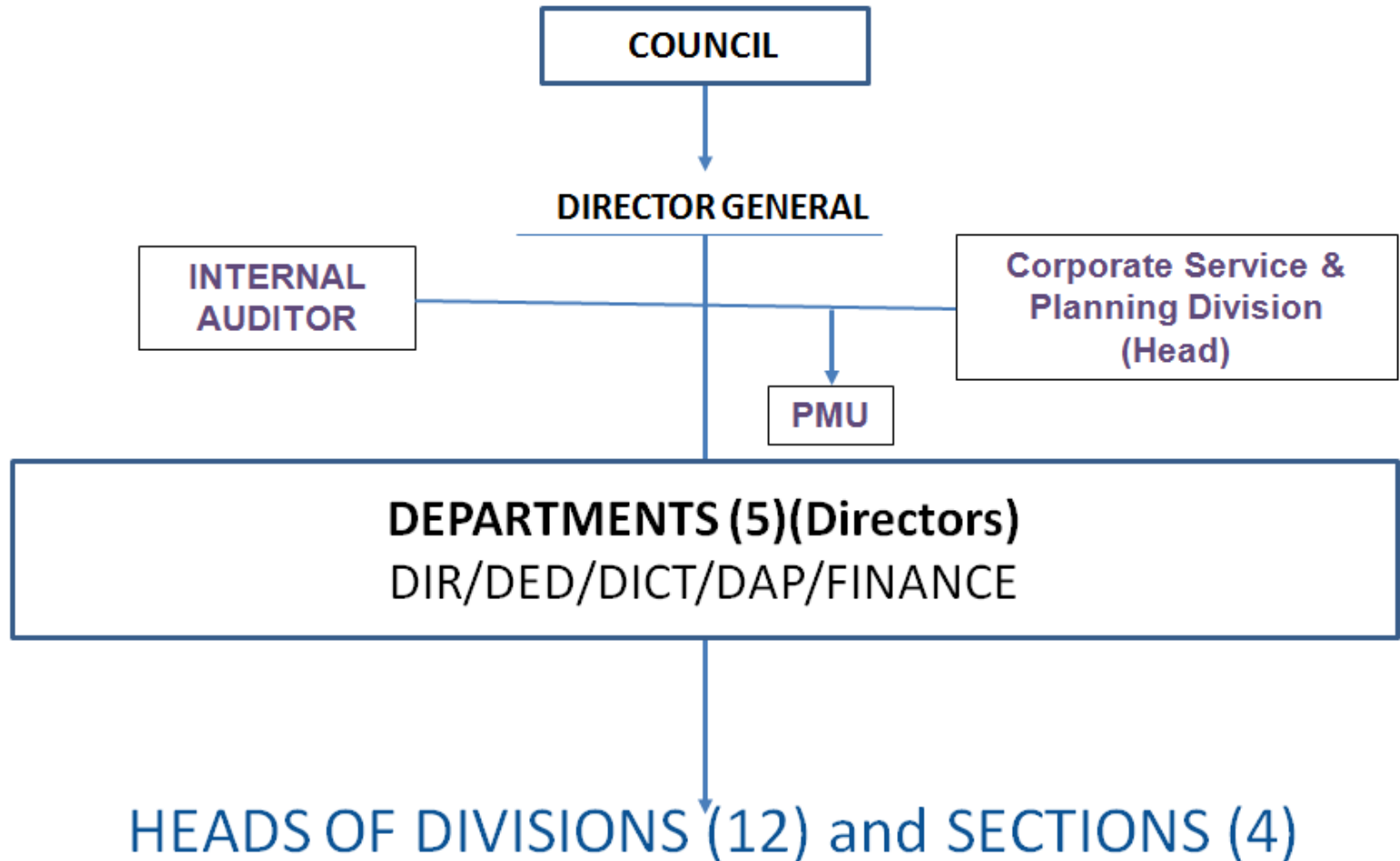
CATEGORIES	FEMALE	MALE	TOTAL
RESEARCHERS	18	17	35
TECHNICIANS	6	11	17
ADMINISTRATION AND FINANCE	10	23	33
TOTAL	34	51	85

1.4 ANNUAL BUDGET (2014/15)

(1 US. \$ = TSHS 2,200)

BUDGET ITEM	AMOUNT IN TSHS
DEVELOPMENT	2,337,825,000
OPERATING COST	778,000,000
SALARIES	1,803,299,000
OTHER INCOME	1,000,000,000
TOTAL	5,919,124,000

1.5 ORGANIZATIONAL STRUCTURE





1.6 CORE DEPARTMENTS

- **Industrial Research (Director)**
 - Food & biotechnology Division (Head)
 - Industrial Chemistry and Agro-processing Division (Head)
 - Environment and Occupational Safety Division (Head)
- **Engineering Development (Director)**
 - Materials Science and Technology Division (Head)
 - Textile and Leather Division (Head)
 - Energy Division (Head)
- **Information, Communication Technologies and Technology Transfer (Director)**
 - ICT Division (Head)
 - Instrumentation Division (Head)
 - Technology Transfer Division (Head)



2. ENGINEERING DEVELOPMENT

DIVISIONS

- Engineering Materials Technology
- Textile and Leather Technologies
- Energy Technology



2.1 Engineering Materials Technology

Non Destructive Testing Laboratory at TIRDO Premises

We carry out the following NDT methods:

- 1. Radiography testing**
- 2. Visual inspection**
- 3. Magnetic particle inspection**
- 4. Ultrasonic testing**
- 5. Liquid penetrant inspection**





.../ Engineering Materials Technology

Boiler tubes inspection



**Our Role is to
ensure quality
and safety.**



.../ Engineering Materials Technology

Ultrasonic testing

**Our role:
Quality
assurance in
materials**





.../ Engineering Materials Technology

**Quality assurance of gas pipeline system
by using radiography method**



**Our Role: To
ensure quality
of pipelines
and
environmental
safety.**

.../ Engineering Materials Technology



Quality assurance on a gas pipelines.

.../ Engineering Materials Technology

TIRDO inspected Tanzania 1st off shore gas pipelines at Mnazi Bay, Mtwara



2.2 Energy Technology

OUR ROLE

We carry out energy audits and offer advice on ways to reduce energy consumption and bills



Energy auditing to a municipal water pumping station

.../ Energy Technology

AIM

Dissemination
of renewable
energy
technologies



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Wind water pumping



3. ICT AND TECHNOLOGY TRANSFER

DIVISIONS

- **Information and Communication Technology**
- **Electronics and Instrumentation Technologies**
- **Technology Development and Pilot Plant.**

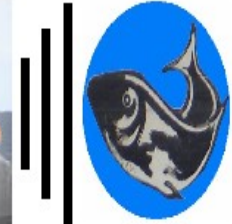
.../ ICT AND TECHNOLOGY TRANSFER

Role

- Cyber security and forensics training
- Research on industrial sector ICT applications (sensor, network, mobile)
- **Support SME's in the application of ICT in their businesses**
- Future plans: Calibration of different scientific equipment

3.1 Information and Communication Technology

Website designing for SME's



Our role:

**Help SME's
advertise
their
business to
expand
market
reach.**

Swahili Version

[Home](#)

[Governance](#)

[Mission/Vision](#)

[Photo Galley](#)

[Contacts](#)



A building which Uwasa
office is

UWASA PRODUCTS



Nile perch after split on process.



3.2 Technology Development and Pilot Plants

Recycling Plant



Unsorted plastic
collected at the
extruder recycling
processing centre



Layout of machines
at the recycling
processing centre

.../ Technology Development and Pilot Plants

AIM

Recycling leather solid waste into valuable products



Leather recycling plant at TIRDO

.../ Technology Development and Pilot Plants

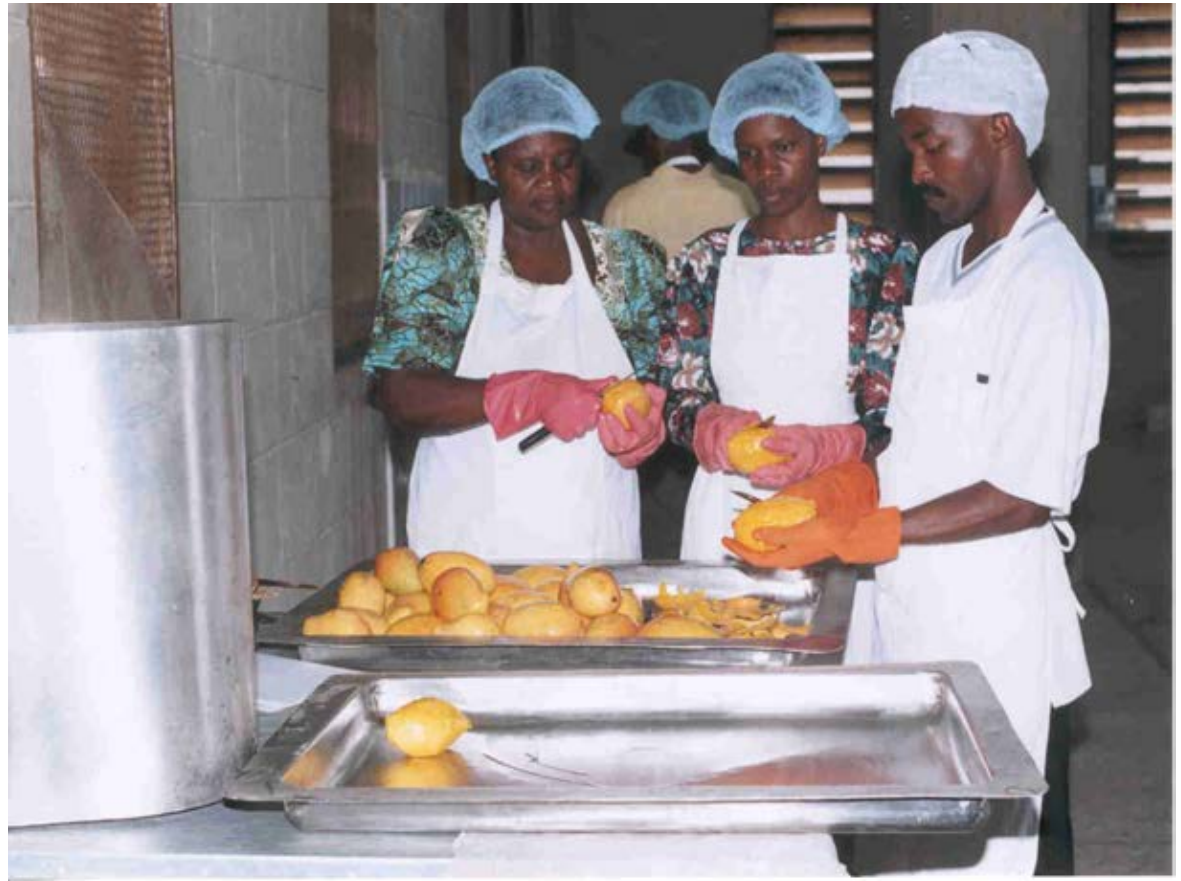


Food processing plant

.../ Technology Development and Pilot Plants

OUR ROLE:

Technology transfer to SME's on good processing methods that results to better products.



Training on fruit processing

.../ Technology Development and Pilot Plants



Processors being instructed on the use of a hydraulic press to remove water and cyanide from grated cassava

.../ Technology Development and Pilot Plants



Demonstration on the use of the grating machine



4. INDUSTRIAL RESEARCH

DIVISIONS

- Agro Processing and Industrial Chemistry
- Environmental Technology and Occupational Safety
- Food Processing and Bio-Technology

4.1 Agro Processing and Industrial Chemistry

OUR ROLE

Analysis of food composition, Nutrition composition including toxic substances.

Analysis of pesticide on food materials.



High performance liquid chromatography (HPLC)

.../ Agro Processing and Industrial Chemistry

AIM

**Obtain
Iodized
mushrooms**



Digester

.../ Agro Processing and Industrial Chemistry



AIM

Determine metals in different samples.

atomic absorption spectrometer (AAS)

.../ Agro Processing and Industrial Chemistry



We teach
SME's on the
functions of
solar dryer
and how to
construct the
dryer.

Agro products solar dryer

4.2 Environmental Technology and Occupational Safety

AIM:

Monitoring toxic gases from generators, boilers, vehicles and incinerators.



Scientist undertaking environmental audit

.../ Environmental Technology and Occupational Safety



XRF machine for quantifying inorganic materials content

.../ Environmental Technology and Occupational Safety

AIM:

Measure amount of dust that is tolerable according to NEMC and international standards.



Measuring amount of dust in a factory compound



4.3 Food Processing and Bio Technology

Role

- Physical, chemical and microbiological testing of foods and water quality
- Training on hygiene for food premises
- Training on HACCP applications and food safety quality management systems

.../ Food Processing and Bio Technology

ROLE

**Ensure
food safety
and
security**



Scientists analyzing samples

.../ Food Processing and Bio Technology

AIM

Microbiological
Analysis of food
samples.



Inoculation process

.../ Food Processing and Bio Technology

Mushroom Farming:

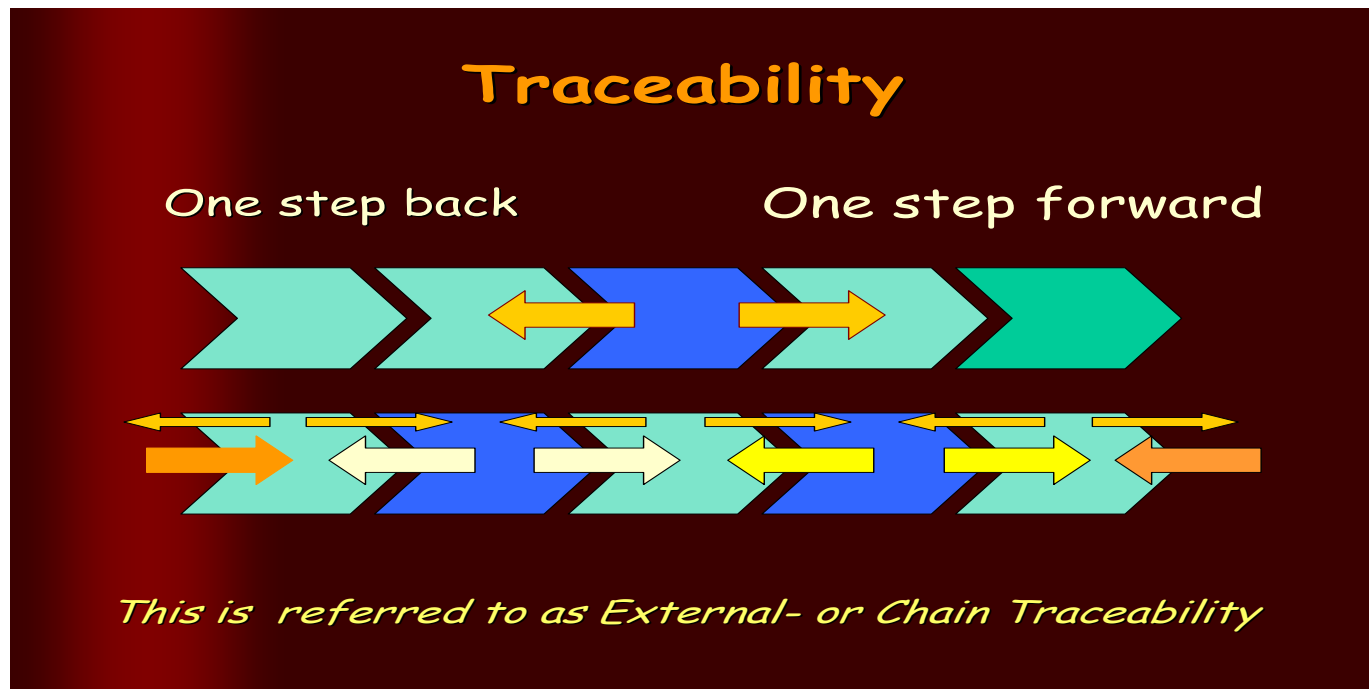
**Help SME's
grow
nutritional
and medicinal
mushrooms**



**Ganoderma Lucidum mushroom harvested
from banana leaves substrate**

Traceability Concept

Traceability is the ability to follow the movement of food or feed through specified stages of production, processing and distribution.





.../ Traceability Concept

Reasons for implementing traceability in Tanzania

- **Supply management improvement**
- **Safety and quality**
- **Brand value protection**
- **Expanded market/market share**
- **Regulation**
- **Customer requirements**

.../ Traceability Concept



Reception and washing of Nile perch prior to processing at fish factory in Mwanza.

.../ Traceability Concept



Packaging of fish fillet in boxes with traceability code and code date ready for export.

.../ Traceability Concept



AIM

Create market
access in
international
market

**Fish fillet packed with Bar Code to ensure
traceability ready for transport**

.../ Traceability Concept

ROLE

Ensure
traceability
and quality



Single grade tea packed, labeled and stacked read for export at Kibena tea factory.

.../ Traceability Concept



Coffee packing and labeled with batch number to ensure traceability.

.../ Traceability in Horticulture



Cut-flowers packed in boxes and properly labeled ready for export

Traceability Spin Off Company, GS1

ROLE

**Introducing
bar coding to
Tanzania
product for
accessing
international
markets**



GS1 offices hosted by TIRDO



5. ONGOING RESEARCH

- Production of value added products and bio fuels (glycerol, ethanol and bio methane) from agro waste.
- Quality improvement of locally produced reinforcing steel bars
- Value addition on the leather solid waste to produce leather boards
- Coal quality assessment and coal technologies development
- Energy management in industries
- Environment management



6. CHALLENGES TO TIRDO

- Meager allocation of research funds
- Food lab only accredited
- Inadequate specialized equipment
- Absence of strong private sector that appreciates R&D contribution for adopting local innovations and technologies
- Technology transfer and commercialization problems



STRATEGIES TO OVERCOME THE CHALLENGES

- TIRDO has prepared land use plan, business plan and feasibility study for investment on the available land (22 ha).
- Utilization of meager consultancy income for skills development and enhancement of marketing activities.
- Proposals for laboratories accreditation
- Strengthening of collaboration with other R&D and academia locally and internationally to compliment each other.

7. COMSATS COLLABORATION ACTIVITIES

- Acquisition of adiabatic bomb calorimeter through COMSATS
- TIRDO – TUBITAK Initiative
 - DG accompanied by 2 technical Directors visited TUBITAK in Aug. 2015
 - TUBITAK Team schedule to visit TIRDO in 25th – 28th May 2016
 - Draft MoU for collaboration prepared



TIRDO – TUBITAK AREAS OF COLLABORATION

- Energy technologies
- Environmental technologies
- Food and Microbiology
- Chemical technologies



15 concept notes covering the four research areas have been prepared



8. PRIORITY AREAS OF RESEARCH COLLABORATION UNDER COMSATS

- Agro processing, food and micro-biology
- Renewable energies
- Gas and petrochemical technologies
- Coal technologies
- Iron and steel technologies
- Textile and leather technologies
- Natural and medicinal products
- Biotechnologies
- Pollution prevention and control
- ICT

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