

ENGINEERING TECHNICIANS DAY 2019

THEME:

**THE ROLE OF ENGINEERING TECHNICIAN IN
ACHIEVING INDUSTRIAL BASED ECONOMY
IN THE COUNTRY**

PRESENTATION:

**Capacity Development & Employment Opportunities
for Engineering Technicians.**

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Outline:

1. Background

2. Is there a Need for More Capacity Building?:

✓ **Policy Perspectives**

✓ **Quality of Workforce in Tanzania**

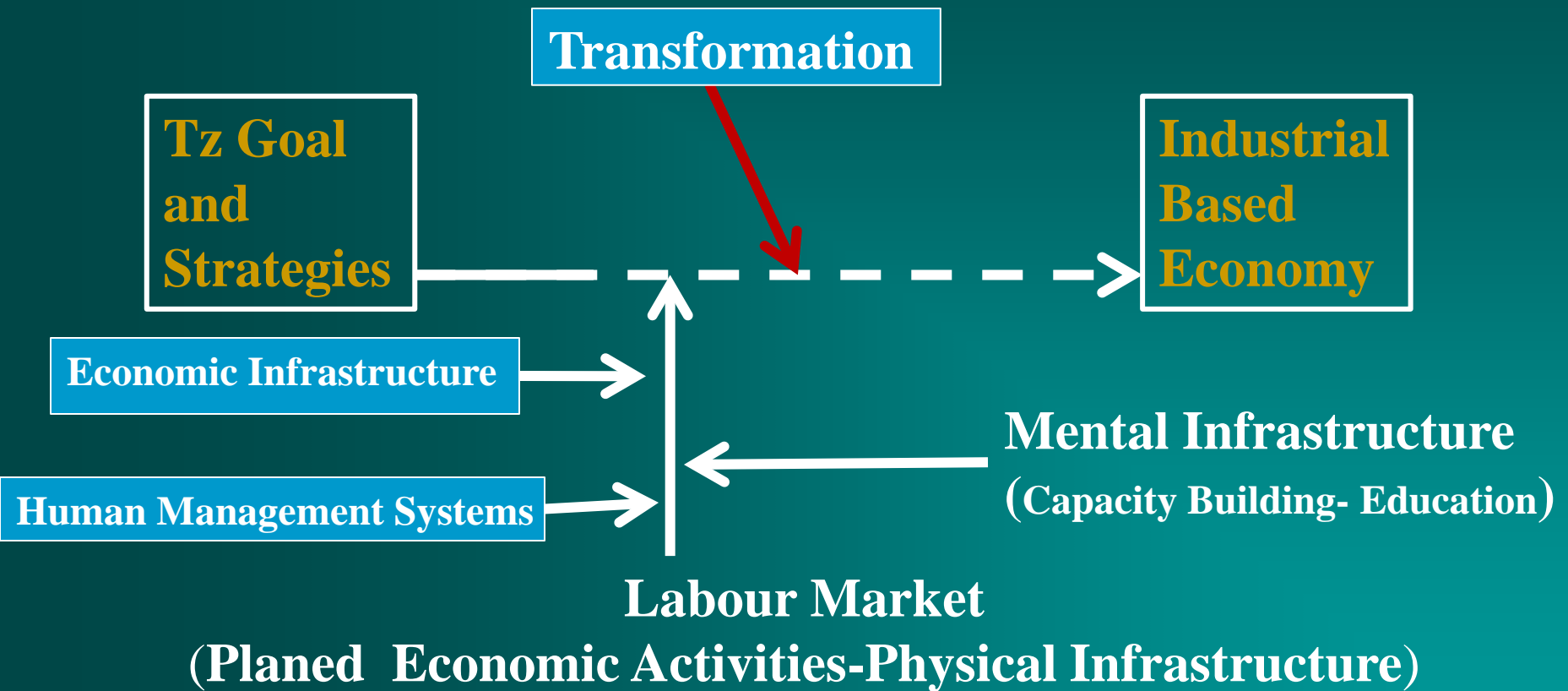
3. Significant of Technical Education and Training

4. Challenges

5. Conclusion

1. Background Information

Key Components towards Industrial-Based Economy:



2. Is there a Need for More Capacity Building?

2.1 Policy Perspectives and Workforce Requirements;

Policy/Strategy	Objective	W/force Requirement
TDV 2025, 1999	Transform from low productivity to a diversified and semi-industrialized economy	Quality and Balanced Technical Workforce: Engineers/Technologists: Technicians: Artisans
FYDP II, 2016	“Nurturing Industrialization for Economic Transformation and Human Development	
SIDP, 1996	Development of intermediate and capital goods industries	

.....Workforce Requirements

Policy/Strategy	Objective	Requirements
CIP, 2003	Promote and use of modern technologies and facilities; and effective supervision of construction projects to ensure value for money	Quality and Balanced Technical Workforce: Engineers/Technologists: Technicians: Artisans
ICT, 2003	Driving force - globalised economy: knowledge-driven, and built on creativity, know-how, imagination and innovation	
Key priority sectors: -CORE :Agri-business, Tourism and Hospitality, and Energy; -ENABLERS : Construction, Transport and Logistics, and ICT.	-Design and expand alternative sources of power; -Design, develop and manage processing machinery and transport infrastructure -roads, ports, railways, airport and industry infrastructure	

Source: URT, Ministry of Infrastructure Development, (2009) – modified by the author

.....Workforce Requirements

General Observations:

- ✓ Most of the required interventions that are necessary for the transformation of economy are **technology- based**;
- ✓ Need **adequate and competent** engineers, technologists: **engineering technicians**: Artisans in various formal and informal sectors;
- ✓ Indirect positive effect on **job creation/employment opportunities**

2.2 Quality of the Work-force in Tanzania

Education Level & Youth Labour Force Participation

➤ Figures according to the ILFS, 2014 - working population of Tanzania Mainland is 25,750,116 persons = 57 % of total population:

- ✓ 61.3 % - had primary education level;
- ✓ 22.3% - never attended formal education;
- ✓ 55 % i.e. 14,761,562 - youth

88.3% employed

11.7% unemployed

65.8% are in agriculture, forestry and fishing;
2.2% Construction; and 3.4% Manufacturing

...Quality of the Work-force in Tanzania

Skills Mismatch & Lack of Work-related Attributes:

- Available data indicate also that:
- ✓ Employees with requisite knowledge and skills seem to be in short supply;

- 
- ✓ Graduates entering labour market lack: in-depth knowledge and skills of present and of emerging technologies; ii) communication related skills; and iii) work-related attributes (employability/life skills) essential for employment

...Quality of the Work-force in Tanzania

- Most recommended Work-related Attributes (employability/life skills), include:

Attributes	Attributes
1.Integrity (trustworthy)	10.Commitment towards work
2.Reliable	11.Detail-oriented
3.Teamwork ability+	12.Organized
4.Professional Codes/ Ethics	13.Positive attitude towards work
5.Result-oriented	14.Adaptability
6.Self confidence	15.Visionary
7.Self motivation	16.Flexible
8.Time management	17.Critical thinking
9.Creativity + Innovation	18.Resource Management

Source: Modu, G (2016)

...Quality of the Work-force in Tanzania

General Observations:

- ✓ **Majority of working Tanzanians are with only primary education or without education;**
- ✓ **Graduates lack in-depth knowledge and skills of present and of emerging technologies; and employability/life skills;**
- ✓ **There is little job creation in the formal sector,**
- ✓ **Most jobs are in the low-productivity and low paying activities in agriculture and private informal sectors;**
- ✓ **Need of balancing between “*quality and quantity*” of the required workforce**

.....Is There a Need for More Capacity Building?

- YES - There is a Need for More Capacity Building! Hence, Investing in people, their knowledge and skills is the key for the success of sustainable national socio-economic development:



“If that is the future we want, we must invest in our youth of today”

Technical Education and Training (TET) is in a strategic position in capacity building

3. Significance of TET

- ❖ Absorbs a big proportion of secondary school leavers (youth);
- ❖ Common objective is to impart mainly in youth, knowledge; skills and adequate understanding;
- ❖ Is critical in addressing the problem of poverty and its associated problems starting at household level.



“Let us recognize that extreme poverty anywhere is a threat to human security everywhere” (Kofi Annan, 2004).

...Significance of TET

Background:

- ✓ 5 engineering-based colleges were built between 1970 and 1979:
Dar es Salaam, Arusha and Mbeya Technical Colleges;
Rwegalulira Water Resources Institute – DSM; and National Institute of Transport – DSM
- ✓ Formulation of TET Policy in 1996
 - to increase student enrolment in science and technology;
 - to raise the national ratio of engineers: technicians: craftsmen from 1:2:14 in 1999/2000 to 1:3:18 in the medium term, and to 1:5:25 in the longer term as internationally accepted.
- ✓ Establishment of NACTE in 1997
 - by Parliamentary Act No. 9

...Significance of TET

...Establishment of NACTE in 1997

- ✓ Act defines TET as “*education and training undertaken by students to equip them to play roles requiring higher levels of skills, knowledge and understanding/attitude and in which they take responsibility for their areas of specialization*” as technicians, semi-professionals and professionals;
- ✓ **NACTE is multi-sectorial body, that covers all tertiary institutions, other than universities and their affiliated colleges**

...Significance of TET

...Establishment of NACTE in 1997

The key roles of NACTE include to:

- **Ensure overall coordination of technical education and training;**
- **Establish a national system of awards;**
- **Ensure the relevance of technical education and training to labour market demand;**
- **Institute systems of quality control and quality assurance in technical education and training; and**
- **Register and accredit both public and private technical institutions.**

...Significance of TET


Establishment of National Technical System of Awards:

- ✓ NTAs are **competence-based**;
- ✓ ...”a qualification must address both the ‘theory’ needs as well as the “practical” needs of learners and a qualifying learner must be able to understand as well as do something useful with the knowledge, in a real-world context”;
- ✓ **Measure** of “Competence” is qualitative and instrumental: “...ability to do something useful”;



...Significance of TET

NTA system has 7 award levels and linked to NVA system

	NTA level	Qualification Title
NACTE	10	Doctorate
	9	Master Degree
	8	Bachelors Degree
	7	Higher Diploma
	6	Ordinary Diploma
	5	Technicians Certificate
	4	Basic Technician Certificate
		
VETA	NVA 3	Certificate of competence level II
	NVA 2	Certificate of competence level II
	NVA 1	Certificate of competence level I

...Significance of TET

- Registration of Technical Institutions

Field of Study	Registered Institutions		
	Public	Private	Total
Business, Tourism and Planning	56	87	143
Health and Allied Sciences	58	105	165
Science and Allied Technologies	57	33	90
Teaching and Learning Facilitation	44	98	142
Grand Total	221	319	540



- **Out of 90 there are 24 institutions (27%) offering engineering-based programmes: 19 are public institutions and 5 are private institutions:**
 - 2 Large Institutions: >10 programmes: DIT and ATC**
 - 5 Medium Institutions: >4 < 10: KIST- Zanzibar; Water Development Management Institute-DSM; **Al-Maktoum College of Engineering and Technology-DSM;** Dodoma Polytechnic of Energy and Earth Resources Management;**
 - Transport: National Institute of Transport=DSM; Dar es Salaam Maritime Institute – DSM; Tanzania Institute of Rail Technology –Tabora; Military Aviation School – Ngerengere**



- **Relevance of Technical Education and Training:**
- ✓ **Competence-Based Education and Training (CBET) – demand-driven aims at preparing *graduates to be “job creators and not job seekers”*, hence *minimize risk of unemployment and increase value of human capital***

- **Instituting System of QA and QC:**
- **procedures and guidelines for quality control and quality assurance for technical institutions;**
- **Existence of QA and QC mechanism is a fundamental requirement;**



Students Enrolment in Tis -NTA Level 4 (Basic Certificate) to NTA Level 6 (Ordinary Diploma):

Academic Year	Female	Male	Total
2015/2016	898	4,839	5,737
2016/2017	977	4,778	5,754
2017/2018	965	4,073	5,038
2018/2019	871	3,880	4,751

- Female participation is still very minimal and the gap between female and male participation is still big.

4. Challenges :

- **Financing of TET: the sector is characterised by heavy dependence on the government;**
- **Lack of formal mechanisms to identify and project critical skills required in the corresponding sector;**
- **Inadequate training resources/facilities;**
- **Limited linkages with Industry;**
- **Inadequate Economic Infrastructure and Human Management Systems;**
- **Lack of Scheme of Service for Engineering Technicians Cadre in the World of Work in Tanzania;**
- **Gender Mainstreaming**

Conclusion:

“Do We Want to Speed Up Transformation
Process of Tanzanian Economy?”



*“Investing in Technical Education and
Training isn’t just the right thing to do,
It’s smart economics”...*

THANK YOU