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THE ENGINEERS REGISTRATION BOARD

15 YEARS OF IMPLEMENTATION OF TANZANIA DEVELOPMENT VISION 2025

**PROGRESS IN INDUSTRIAL DEVELOPMENT – TARGETS AND GOALS,
ACHIEVEMENTS, CHALLENGES AND THE WAY FORWARD**

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ABSTRACT

In terms of the National Composite Tanzania Development Vision 2025 which was launched in year 2000, Tanzania aspires to become a semi-industrialized Middle Income Country with a GDP per capita of US \$ 2,500 by the year 2025. Over the past decade (2005-2015), Tanzania has sustained steady 6-8 % growth that has come mainly from the primary production sectors of agriculture, mining and tourism. The 2nd Five Year Development Plan to be launched during the Fiscal Year 2015/2016 will provide the strategic direction in the quest to achieve the desired objectives of sustained growth with industrialization, as well as set and specify priorities in resource allocation for industrial sector development.

This paper briefly outlines key outcomes and trends of 15 years of the implementation of Tanzania Development Vision 2025, and presents perspectives on the desirable pattern of industrialization going forward. The overall industrial development strategy is discussed in considering the opportunities of regional markets development and related challenges, as well as the dynamics of trade globalization.

The role of engineers is highlighted as critical for Tanzania to acquire the adaptive capacity for industrial technology application and innovation which is necessary for sustainable economic development to be achieved through industrialization.

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1 TANZANIA DEVELOPMENT VISION 2025 – OVERALL PERFORMANCE TARGETS AND GOALS

1.1 Overall Performance Targets and Growth

The National Composite Tanzania Development Vision 2025 (“**TDV 2025**”) was launched in 2000 with set objectives to be realized over a 25-year time horizon; and hence lift the country out of the Low Income Country (“**LIC**”) group with a GDP per capita of less than US \$ 1035, to become a semi-industrialized Middle Income Country (“**MIC**”) with a GDP per capita of US \$ 2,500. With a population projected to reach the 50 million mark by 2025, the target GDP per capita will aggregate to a national GDP of US \$ 125 billion. Starting from the current GDP of US \$ 50 billion as the base, Tanzania needs to sustain high growth rates of not less 10% year-on-year over the next decade in to reach the given target GDP figure of TDV 2025.

A mathematical computation of GDP growth compound growth rate of 10% year-on-year over the next decade (2015-2025) and starting from the GDP base of US \$ 50 billion, will yield results of an aggregate national GDP of US \$ 130 billion. The calculation indicates that the target GDP of TDV 2025 is achievable, provided the economy of Tanzania can attract substantial investments that will fuel and sustain high growth rates in double digits above 10%. Figure 1 illustrates the figures and trend of aggregate national GDP between 2006 and 2015; while Figure 2 illustrates the corresponding growth rates achieved during the first decade of implementing development programs under TDV 2025 with economic reforms.

Figure – 1 ILLUSTRATION OF AGGREGATE FIGURES AND GROWTH TRENDS OF TANZANIA GDP

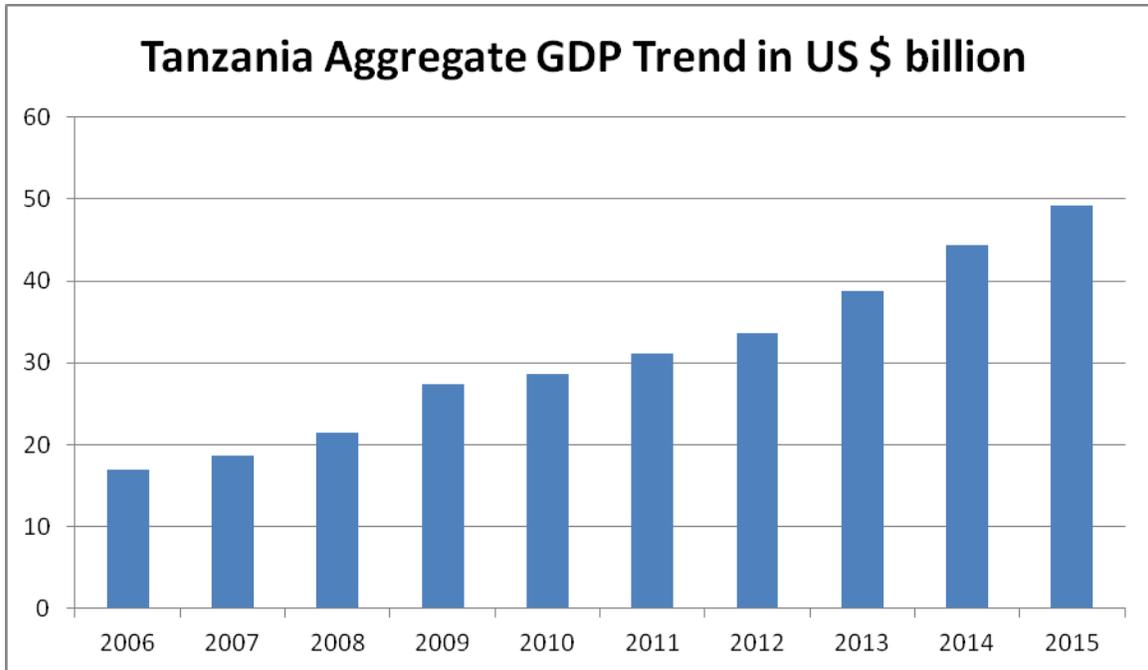
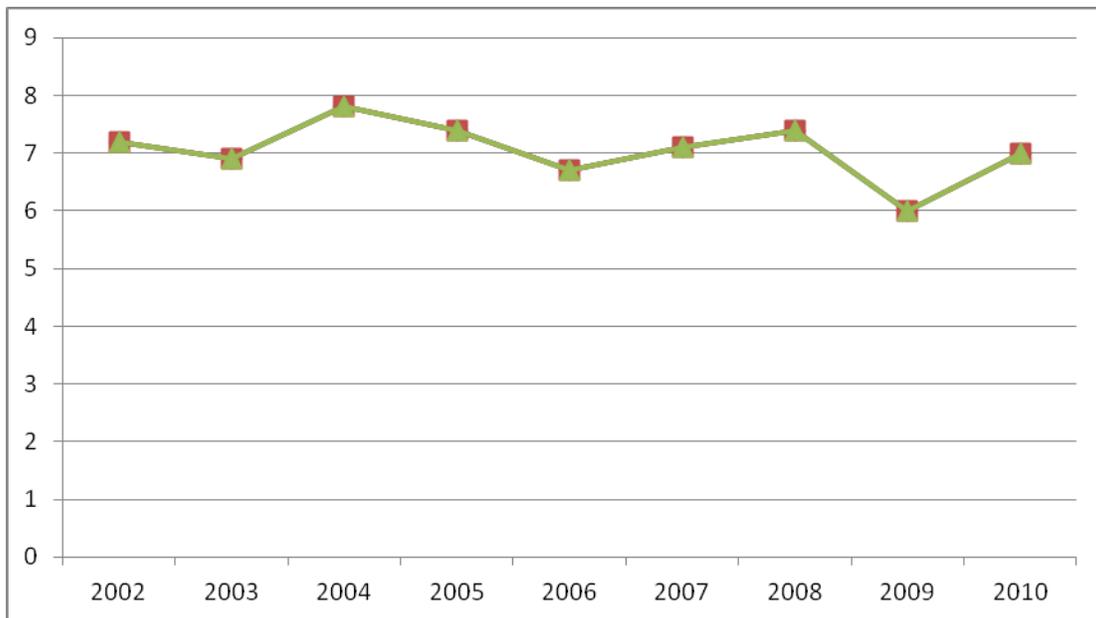


FIGURE 2 – GROWTH RATES DURING FIRST DECADE OF IMPLEMENTING TDV 2025 PROGRAMS



1.2 Overall Performance and Growth towards TDV 2025

TDV 2025 program was launched during the period of public policy reforms linked to the structural adjustment program that dismantled the hitherto ubiquitous State Owned Enterprises (“SOEs”) which occupied and dominated the “commanding heights of the economy” including the nascent industrial

sector. Starting from an agricultural economic base the first attempt to industrialize beginning in the late 60s lasted until about 1980 when the economy of Tanzania spiraled downwards into crisis. In spite of recording past limited success to achieve import substitution of some industrial commodities, Tanzania remained to be primarily an agrarian society that conducted external trade in raw commodities as well as minerals and tourism. However, a steady and firm hand in the management of macroeconomic policies enabled the Country to build confidence manifest through inflows of Foreign Direct Investments (“FDI”), and hence Tanzania was able to embark on a firm path of economic recovery and growth which is aptly illustrated in Figures 1 and 2.

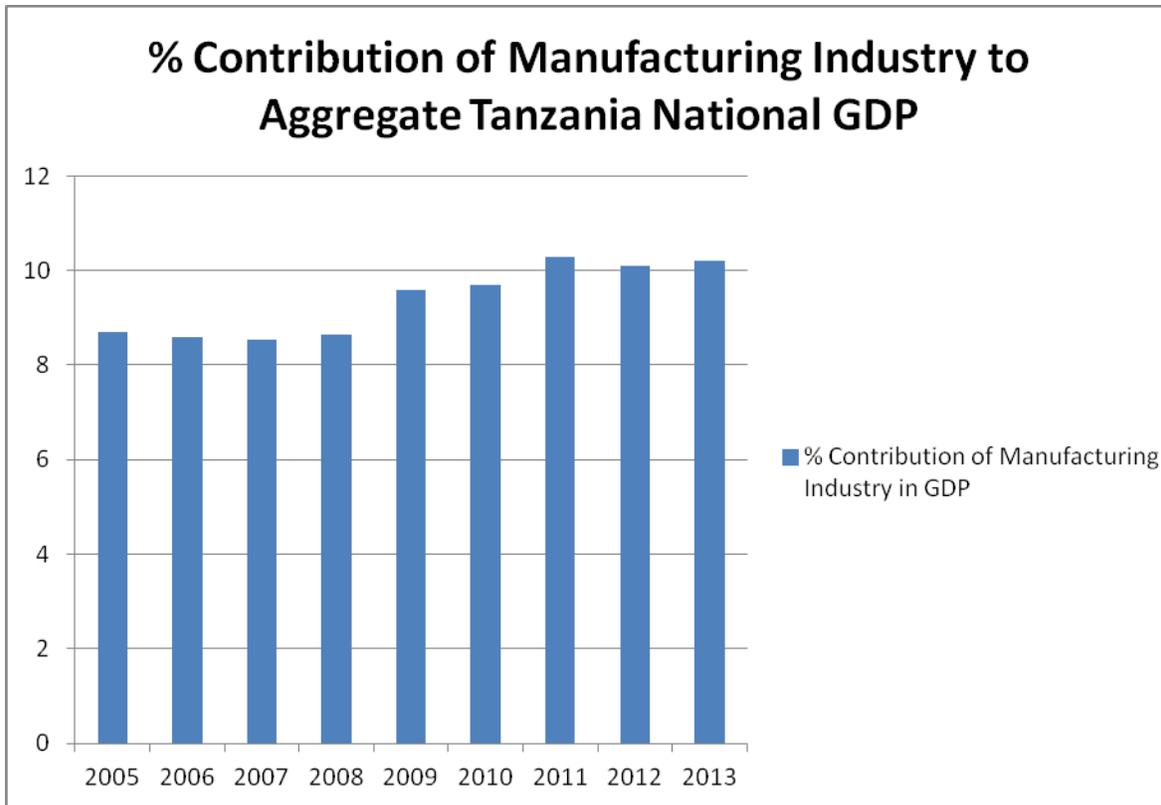
Figure 2 illustrates a fairly steady state of GDP growth at an average rate of about 7% year-on-year during the first decade (2000 – 2010). That average annual growth rate and trend have been more or less maintained during the period 2010 – 2015. Therefore, the first 15 years of implementing the programs under TDV 2025 have experienced nearly steady growth rate which builds confidence that the performance targets and intended objectives are realistic and can be achieved as planned. However, in order to change the steady state of growth under dynamic inertia, a “disruptive force” must be introduced in the form of investments that will impact the positive growth trend to enter into a new state of dynamic disequilibrium, which will finally move the growth path into a new orbit of double digit growth rate towards the TDV 2025 aggregate GDP target of US \$ 125 billion.

2 INDUSTRIAL PERFORMANCES AND THE QUEST TO TRANSFORM THE ECONOMIC BASE

2.1 15 Year Industrial Sector Performance in Relation to GDP

Figure 3 below indicates that during the period 2005 – 2013, the manufacturing sector accounted for an average of 9% of the national aggregate GDP. In order for Tanzania to become a semi-industrialized Country, contribution of manufacturing to the national economy must reach a minimum of 40% of the GDP. Therefore, in order to achieve the desired socio-economic transformation and higher growth rates in terms of the overall objectives of Tanzania Development Vision 2025 (“**TDV 2025**”) and the 2nd Five Year Development Plan (“**FYDP**”) which will be launched during the second half of FY 2015/2016, the economic base of Tanzania must undergo transformation from being founded upon and dominated by natural resource exploitation activities and extractive industries (*agriculture, tourism and mining*) as lead sectors; to become a modern economy anchored by a broad and diverse base of manufacturing, processing and packaging industries that will lead both the productive as well as the export trade sector.

FIGURE 3 – CONTRIBUTION OF MANUFACTURING SECTOR TO AGGREGATE GDP



2.2 Prospects for Transformative Industrial Development

The desired transformation in terms of TDV 2025 that has been graphically illustrated in Figure 4, is to catapult the economy of Tanzania from the current low income base to the orbit of higher incomes and growth that can be achieved through substantial investments in building a national enterprise platform of modern industrial production capacity and in enhancing national trade capacity which will be synchronized with investments in economic services infrastructure (*multi-modal transportation infrastructure, electric power supply, industrial water supply and telecommunications*) that will enable and facilitate production as well as trade efficiency.

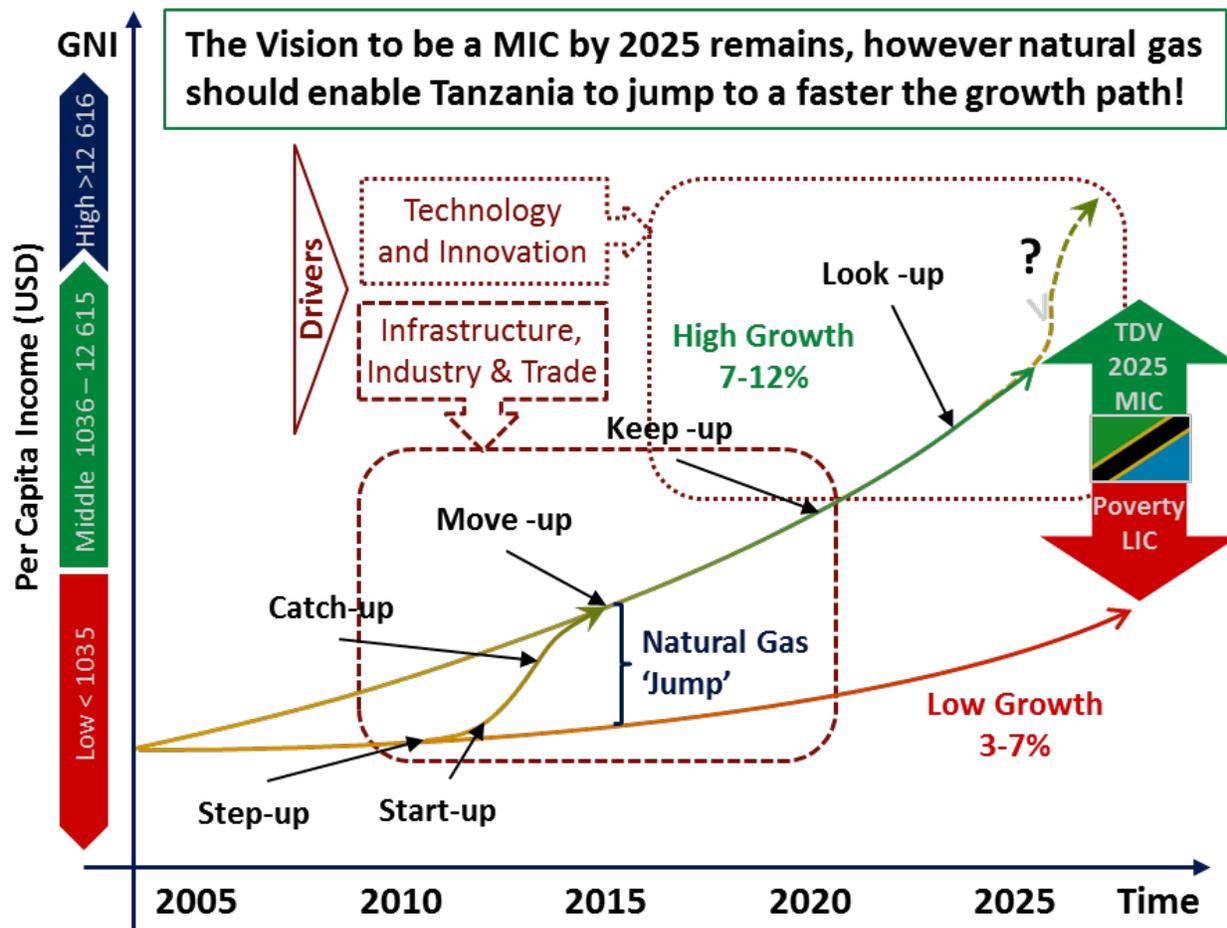


FIGURE 4 – ILLUSTRATIVE MODEL OF THE DESIRED GROWTH TO ACHIEVE TDV 2025 GOALS

The illustrated quantum growth is expected to come from gas fuelled development of petrochemical industries, energy intensive industries such as mineral beneficiation (e.g. *Mchuchuma coal, Liganga iron/titanium, Dutwa/Kabanga nickel and Engaruka Soda Ash*) and cement production; as well as the construction of power generation and transmission, roads construction, major railways and ports infrastructure projects already under implementation. The establishment of thematic Special Economic Zones with a combination of manufacturing platforms as well as trade and logistics clusters linked to the local economic activities and ranked in priority by economic competitive factors that will attract investments in Dar Es Salaam (Kurasini), Bagamoyo, Dodoma, Kigoma, Arusha, Mbeya, Njombe (Makambako), Shinyanga, Mtwara and Tanga, will be undertaken in order to enhance export trade capacity in manufactured goods and contribute to the envisaged rapid aggregate growth. **The exploitation of natural gas will have major catalytic impact as industrial feedstock as well as fuel that will provide for rapid implementation of electric power generation projects which will energize the industry development initiatives.**

3 THE PRINCIPLE OBJECTIVES OF INDUSTRIALIZATION FOR TANZANIA

3.1 Principle Objectives and Economic Motivation for Industrialization

Subject to the fundamental laws and principles of economics as well as physical constraints and technological limitations, there are two basic motivations for any production undertaking that is free of any coercion such as would be the case with slavery or colonization. In a free economy, there is the fundamental motive to undertake production to meet own requirements for self-reliance; and there is the second motive to produce and supply the demand of others through trading to gain income. The two motives are not mutually exclusive and the optimum situation to ensure industry auto-regeneration and sustainability is to be able to achieve both simultaneously.

In application of the same fundamentals to the economy of Tanzania in respect of industrial production, the best scenario would be that of having domestic demand in critical mass that will amortize and absorb all the investment costs with an acceptable rate of return on the capital employed, such that manufactured goods for export trade would be competitively priced on the basis of marginal cost of producing the surplus for export trade over and above the requirements to supply domestic demand. The national objectives for industrialization of Tanzania are defined by the same direct fundamental economic motives outlined above, as well as other externalities that have significant socio-economic impact and consequences in their outcomes which are summarily outlined as follows:-

- a. To meet the domestic basic needs for industrial manufactured goods;
- b. To create value addition chains for raw materials and commodity outputs from primary production sectors of the economy such as agriculture, livestock, fisheries, forestry and mining;
- c. To enhance national direct global trading capacity in manufactured goods as well as to establish transit trade value-addition capacity for re-export to the regional markets of EAC, SADC and COMESA;
- d. To transform the economic base of the country from dominance by agriculture and the extraction industries in order to allow manufacturing and processing to become lead sectors of the national economy; and
- e. To achieve socio-economic transformation through the building of national enterprise capacity in all key sectors of the economy with requisite technology and innovation capacities that will build an industrial society in Tanzania with endless opportunities to create economic value, wealth and prosperity for all.

The key objectives of industrialization aforementioned *supra* provide the criteria for priority setting in defining the desired pattern of planning industrial development and for the selection of targeted promotion of foreign direct investments, as well as the screening and evaluation criteria for industrial projects that may be in a situation of competition for land, human, financial or any material resources allocation required for industrialization to take place.

With the principle objectives of industrialization clearly defined, the strategy and desired pattern of industrialization can be determined in considering domestic conditions as basis for the overall strategy; and in that regard external factors which will set the conditions and impose constraints to the overall industrialization strategy and implementation. An outline of the desired pattern of industrialization and priority areas of industrial development is given below.

4 THE DESIRED PATTERN OF INDUSTRIALIZATION AND PRIORITY AREAS OF INDUSTRIAL DEVELOPMENT

4.1 The Desired Pattern of Industrialization

During the FY 2015/2016, Tanzania will launch its 2nd FYDP that will have industrialization as its main thrust intended to move the Country out of the perennial poverty trap of a weak agrarian economy characterized by low technology and inefficient production methods with consequent low per capita income levels. In that regard, Tanzania has identified key industry sectors that will unleash the latent potential for rapid growth and spearhead the desired high growth rate and economic transformation for poverty reduction over the next decade and beyond.

The desired pattern for industrialization of Tanzania to meet the national objectives presented hereinabove would be achieved through the establishment of the following industry clusters in optimum time:-

- a. Food Agro-processing Industries;
- b. Textiles and Apparel Industries;
- c. Leather and Leather Goods Industries;
- d. Building Materials Industries;
- e. Pharmaceutical Industries;
- f. Cosmetics and Beauty Products Industries;
- g. Jewelry and Lapidary Industries;
- h. Consumer Durables Manufacturing, Processing and Assembly Industries;
- i. Capital Goods Manufacturing and Assembly Industries; and
- j. Basic Capital Intensive Manufacturing and Processing Industries.

Annexure 1 hereto provides an indicative list of typical manufacturing and processing activities clustered in the desired pattern of industrialization that has been outlined above.

4.2 Priority Areas to Build Capacities for Industry Related Development

Tanzania is embarking on industrialization from a situation of low levels of established requisite industrial capacities and capabilities in technology application and management that are fundamental in order to achieve sustainable industrial development. In that regard, the priority areas for industrial

development must include a program of capacity and capability development in the key areas outlined below, in order to create a vibrant business infrastructure with national enterprises and institutions developments that will domesticate the industries will come to be relocated in Tanzania.

Hence, sustainable industrial development program that will build confidence and hence attract long term to invest in the industrial sector in Tanzania will require a national program that will ensure a parallel and coordinated development of the following key areas:-

- a. Modernization and commercialization of primary production activities that will provide inputs to the manufacturing and processing enterprises – *agriculture, livestock, forestry, marine products harvest (lakes and ocean harvest) and mineral extractive industries*;
- b. Industrial parks development as physical platforms for locating world class and competitive manufacturing and processing enterprises with reliable and affordable supply of industrial quality infrastructure and related services – power, gas, industrial water, telecommunications and industrial waste management;
- c. Human skills and Enterprise development that will create a world class labour pool and the requisite business infrastructure to domesticate the regenerating industrial sector;
- d. Technology transfer and production innovation capacity development that will be coordinated by the National Commission of Science and Technology (“**COSTECH**”) to ensure that the development of new industries will be effective in building national capacities to acquire and adapt various technologies for the long term development requirements of Tanzania;
- e. Logistics Clusters development at marine ports, inland dry-ports and border posts with functional physical infrastructure supply that will provide trade facilitation for the industrial sector to be able deliver efficiently to the regional and global markets;
- f. Cooperation development in select and specific areas of pharmaceuticals, biotechnology and ICT industries as new opportunities that can provide Tanzania the means and capacity to catapult into sustainable high value production using national gifted talents and to extract maximum benefits from endowment in natural resources and biodiversity; and
- g. The development and deepening of national capital and financial markets geared to provide the requisite financial intermediation to promote and sustain industrial development at all levels of national enterprise – *large scale, medium, small and micro industrial enterprises*.

The industrial sector that will be created in accordance with the desired pattern of industrialization subject to economic and market fundamentals will require a national coordinated implementation program that will require a working partnership of Government, Business and Academia, with assignment of specific tasking and institutional responsibility to deliver on each of the priority areas of development outlined *supra*. It is beyond the scope of this presentation to dwell on the institutional framework and set up for coordinating and monitoring the implementation of the national industrial development program. However, it is logical to conclude that the President’s Office Planning Commission (“**POPC**”) and Presidential Delivery Bureau (“**PDB**”) will ultimately shoulder the primary responsibility respectively for planning and implementation oversight of the national industrial development program which will be defined under the 2nd FYDP.

5 THE ROLE OF FOREIGN DIRECT INVESTMENTS AND REGIONAL MARKETS DEVELOPMENTS IN AFRICA

5.1 The Role of Foreign Direct Investments as a Source of Capital

Success of the national industrial development program of Tanzania will, first and foremost, depend on sound and coherent public policies as well as management of the macroeconomic environment in order to provide a sound base for business to build confidence for the requisite commitment to invest long term in industrial enterprises. However, since Tanzania is still a Low Income Country without the capacity for investment capital formation which is commensurate with the requirements of transformative industrial development, Foreign Direct Investment (“**FDI**”) is envisaged to provide the much need capital for the desired industrial development. In that regard, the dynamics of economic globalization and the development of regional market in Africa are the two key factors that will determine the conditions and provide the constraints for Tanzania to FDI that will enable the Country to achieve the desired pattern of industrialization. The dynamics of globalization will determine the rate and flow of much needed FDI for industrial development, while the development of regional markets in Africa will provide the motivation and ultimately determine the investor risk appetite to establish industries in Tanzania.

5.2 Global Dynamics of the Industrial Sector and the China Factor

In considering the dynamics and impact of economic globalization, Tanzania and the rest of African countries have a time window of opportunity to embark on the development path of industrialization by riding on the wave of industrial relocation and move offshore from China which is the number one manufacturing and exporting country in the World. Therefore, the “China Factor” is an important consideration in the overall scheme of industrial development plans of Tanzania. Substantial inflows of FDI are required for the industrialization of Tanzania; and China has the economic capacity and capability as well as the national political will and economic motive to support the drive by Chinese business firms to expand their global commercial footprint by way of investing in the emerging markets of Africa including Tanzania. In that regard, Tanzania has legacy cordial relationships as political basis for industrial development cooperation with China.

5.2 The Geographic Location of Tanzania as a Capital

Figure 5 illustrates the unique geographic location of Tanzania as a maritime nation on the rim of the Indian Ocean and international trade gateway for the hinterland nations of Eastern, Central and Southern Africa. Tanzania with a maritime coastline of about 1,000 kilometers is favourably situated halfway between the Horn of Africa in the North East and Cape of Good Hope to the South. Hence, in that regard, Tanzania has a natural disposition to become the leading multi-modal transportation and logistics hub with wide scope for regional and global trade facilitation which will include shipping, warehousing and bulk storage. The logistics clusters would act as natural magnets to attract all sorts of manufacturing and processing industries that would readily supply the co-located trading enterprises for transportation and distribution of goods to markets.

5.3 Development and Integration of Regional Markets in Africa

Besides geographic location and terrain which are both related to the availability and cost of physical infrastructure, trade treaties and protocols also play an important role in trade defining rules as well as facilitation arrangements, especially with regard to regional markets integration. Tanzania is the bridge economy that links the EAC and SADC regional markets. Furthermore, Tanzania is in the unique position of being the place of physical intersection of the transport corridors which link the markets of the EAC, SADC and COMESA regional trading groups. Figure 6 further below illustrates the trade impact area of the inland African markets that can trade with the rest of the World through the gateway seaports of Tanzania, provided there is appropriate and adequate supply of multi-modal transportation infrastructure with efficient services. **Therefore, Tanzania is the ideal location for investments in market-seeking industries that target the emerging African markets in the regional trading blocs of EAC, SADC and COMESA.**

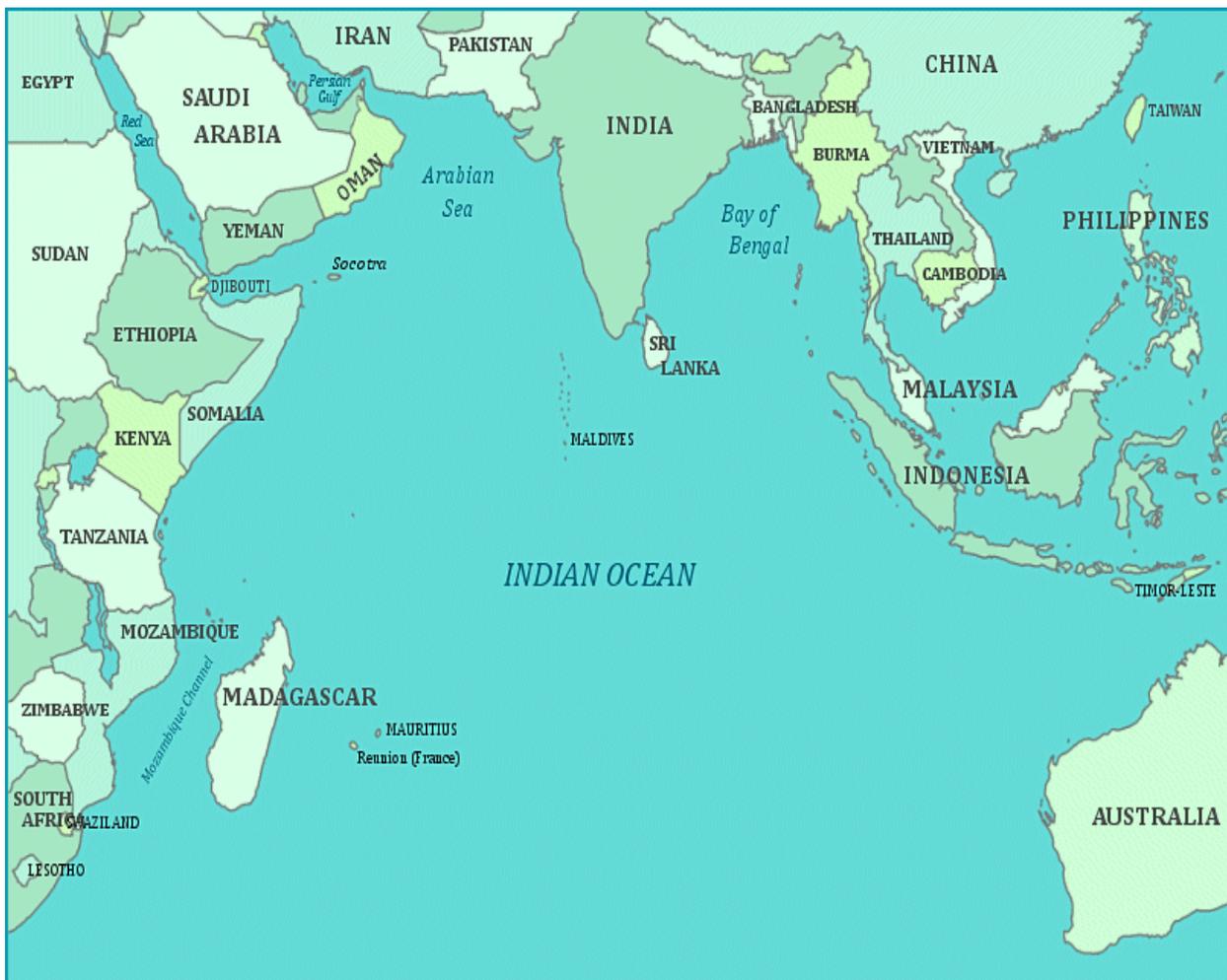


FIGURE 5 – THE GEOGRAPHIC LOCATION OF TANZANIA IN RELATION TO INTERNATIONAL MARITIME SHIPPING ROUTES TO ASIA AND MIDDLE EAST VIA THE INDIAN OCEAN

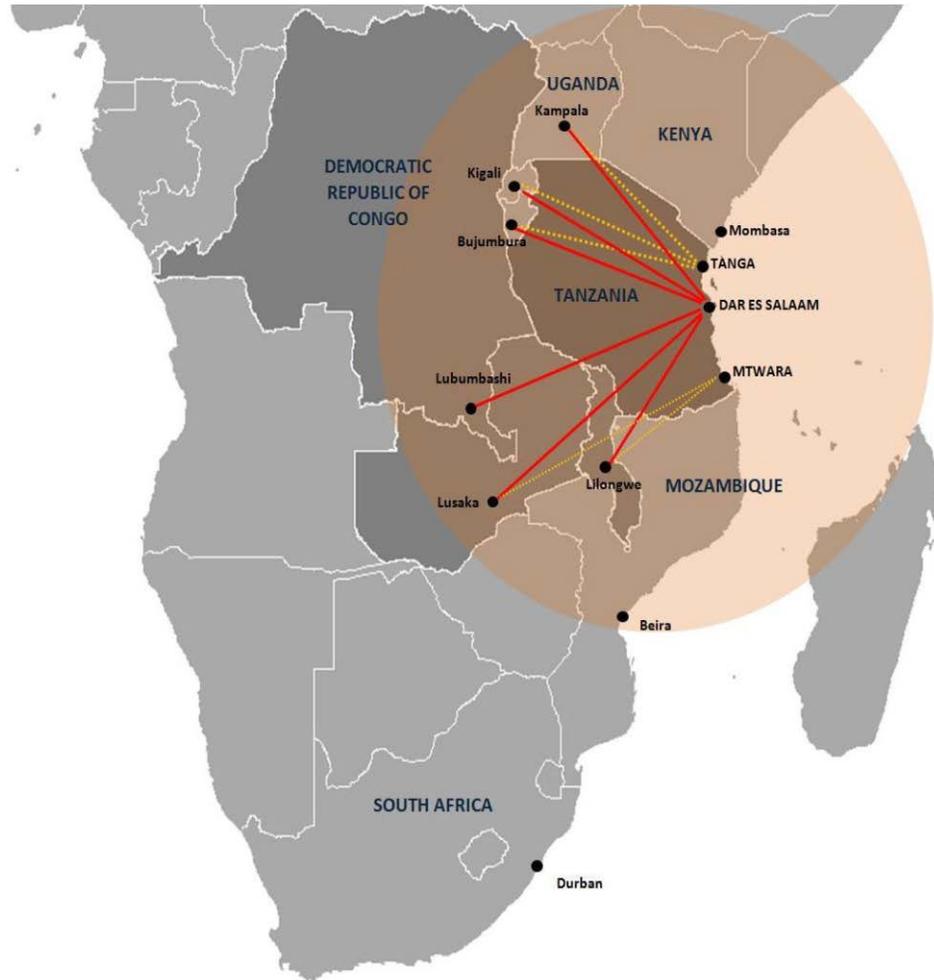


FIGURE 6 – THE STRATEGIC INTERNATIONAL SHIPPING GATEWAY GEOGRAPHIC LOCATION OF TANZANIA AND TRADE IMPACT AREA IN THE CONTEXT OF EAC AND SADC REGIONAL MARKETS INTEGRATION WITH PROVISION OF MULTIMODAL TRANSPORTATION AND LOGISTICS SERVICES

6 INTEGRATED REGIONAL FRAMEWORKS FOR SUSTAINABLE INDUSTRIAL DEVELOPMENT

6.1 Framework for Integrated Multi-sector Development with Industry

In terms of TDV 2025 objectives, manufacturing and processing industry will become the lead sector for economic development and growth which will reduce poverty. An integrated framework for sustainable industrial development with growth and poverty reduction would seek to be inclusive by integrating the key functionally interdependent and interlocking factors of local primary production activities and economic services in a spatial setting; and to use transportation infrastructure to link both to

manufacturing and processing value chains supported by logistics clusters as marketplace and trading platforms. In such a setting, it is the economies of scale that would determine the viability and sustainability of the integrated development framework, because the requisite investment in transportation and other economic services infrastructure will entail substantial amounts of initial capital outlay for building and subsequent expenditure in maintenance.

6.2 Industrialization with Spatial Development Initiatives and Development Corridors

In considering the foregoing, the scale of spatial setting for an integrated development framework will have to be a geographically defined area which has inherent economic and growth potential as a region that can host various primary production economic activities and related value-addition business enterprises linked to trade. In that regard, the Regional Spatial Development Initiative (“RSDI”) Model which has been used and proven elsewhere including SADC countries lends itself readily applicable in considering development of the desired pattern for the industrialization of Tanzania. Hence, the framework for industrial development cooperation will have to be designed to remove the constraints of the primary production sectors that will be part of the value chain which will unleash the inherent economic potential of the various regions to host industries.

Sustainable industrial development requires an integrated approach to motivate and facilitate investments in the following spheres of which are key for any viable industrial economy:-

- a. Production enterprises with local business synergies and linkages to markets;
- b. Infrastructure development synchronized with demand of production enterprises to access markets for domestic and international trade;
- c. Financial services infrastructure to fund physical infrastructure development, production activities and trade;
- d. Utility services and logistics; and
- e. Social services delivery in the industry host region.

“**Development Corridors**” represent the empirical RSDI Model that integrates the above economic spheres and suitable to be adopted as the integrated framework for industrial development of Tanzania in the context of regional markets integration and the dynamics of global markets through cooperation with China.

There is fundamental economic logic to relate and to link the development or investment in production and commercial enterprises with Development Corridors because those Corridors allow for and facilitate seamless movement of **capital** (*i.e. finance*), **goods and services** (*i.e. trade and commerce*), and **People** (*i.e. investors, traders, customers and visitors*), all supported by **social services** delivery programs. Therefore, in conceptual terms of development economics, the integrated framework for growth with sustainable development may be viewed as a synthesis of multiple sector development initiatives and investments layered on top of one another and grouped together as one. In that regard, “Development Corridors” represent a synthesis of aggregate integrated and superimposed:-

- a. Transport Corridors;

- b. Trade Corridors;
- c. Production and Commercial Enterprise Clusters;
- d. Social Services Delivery Catchment Zones; and

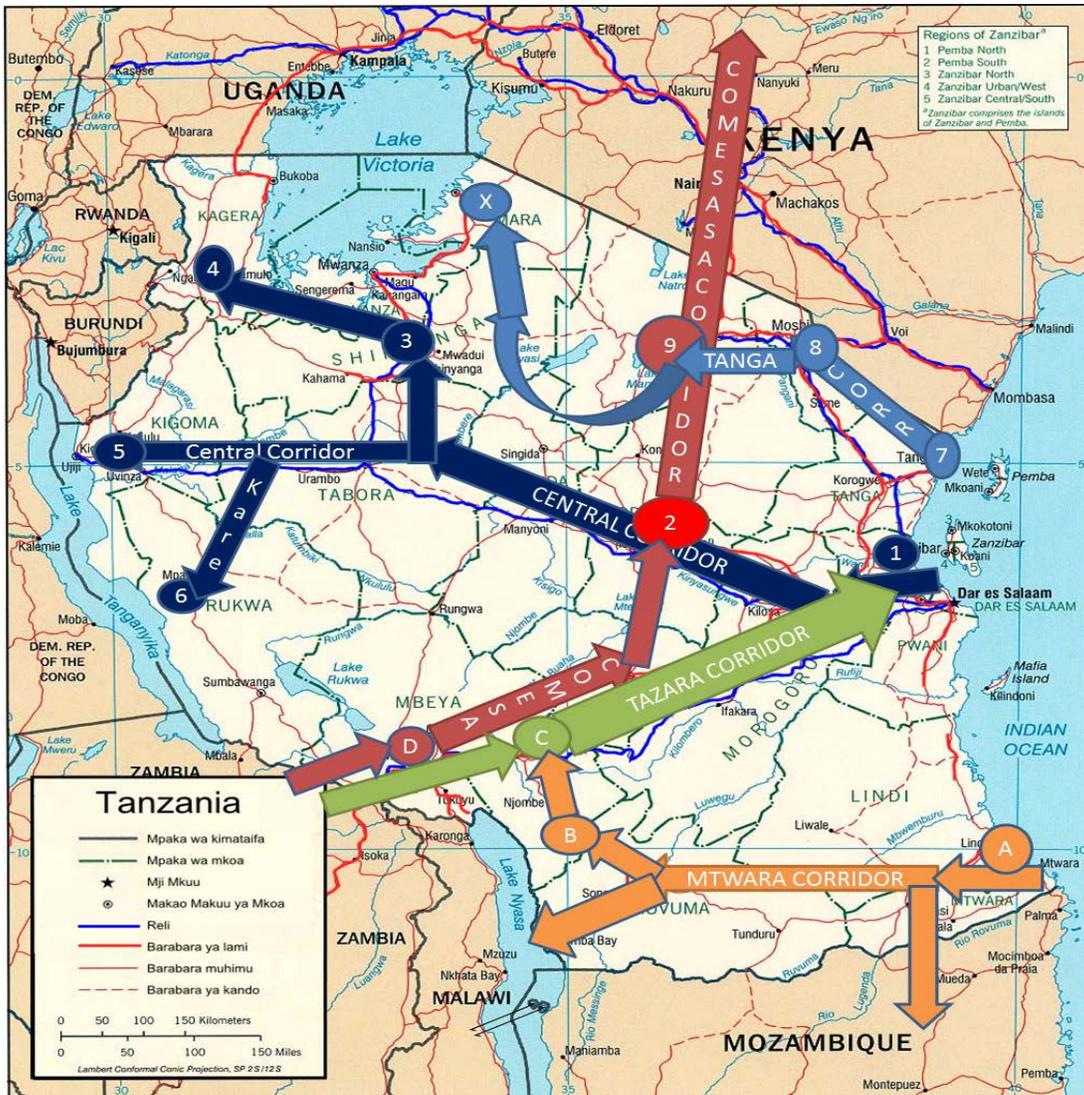
- e. Borderless Human Migration Corridors.

6.3 Development Corridors in Tanzania with Cross Border Hinterland Impact

“Transport Corridors” turn the wheels of commerce in connecting economic impact hinterlands to seaports as gateways for international trade and hence provide the backbone infrastructure that enables and facilitates regional integrated development in primary production, industrial value-addition and trade to create “Development Corridors”. Tanzania is both host and coordinator of Central Development Corridor and Mtwara Development Corridor, which are existing SADC RSDI programs for integrated development designed to unlock the economic potentials of the geographically delineated areas that constitute the respective “Development Corridors”.

Dar Es Salaam, Mtwara and Tanga are respectively the international trade gateways for the existing Central Development Corridor, Mtwara Development Corridor and Tanga Development Corridor. TAZARA Development Corridor is linked to international trade markets via Dar Es Salaam as the gateway; and there is the COMESA Trade Corridor with its axis aligned North-South along the Tunduma-Dodoma-Babati-Namanga “Transport Corridor” which revives the old colonial dream of “Cape-to-Cairo” trading highway in aspirations of the British Empire in global dominance.

Figure 5 illustrated herein before the transport and logistics hinterlands of the seaports of Tanzania, and the same is the “Trade Impact” region of the Development Corridors described *supra* which is illustrated in Figure 6 above.



KEY TO DEVELOPMENT CORRIDOR STRATEGIC SPECIAL ECONOMIC ZONES

- | | | |
|--------------------------|----------------------------|---------------------------|
| A: Mtwara SEZ | 1: Bagamoyo SEZ | 7: Tanga SEZ |
| B: Liganga-Mchuchuma SEZ | 2: Dodoma COMESA Trade Hub | 8: Arusha-Kilimanjaro SEZ |
| C: Makambako SEZ | 3: Isaka SEZ | 9: Manyara SEZ |
| D: Tunduma-Vwawa SEZ | 4: Rusumo SEZ | X: Bunda SEZ |
| | 5: Kigoma SEZ | |
| | 6: Karema SEZ | |

FIGURE 7 – ILLUSTRATION OF TANZANIA DEVELOPMENT CORRIDORS

7 INDUSTRIAL DEVELOPMENT STRATEGY INTEGRATION WITH DEVELOPMENT CORRIDORS

7.1 Industrialization Linkages with Development Corridors

Sustainable industrial development requires **markets** to provide the **demand** that production enterprises must **supply** through **trade** which is enabled by **transport** and **logistics** as well as intermediation by **financial institutions**. Development Corridors provide the framework for industrial development integrated with markets for trade through transport infrastructure and logistics. Therefore, the desired industrial pattern and development strategy should be designed and implemented using Development Corridors as the framework for integrated development.

Development Corridors and Spatial Development Initiatives are designed to unlock inherent potential in local primary production (*agriculture, livestock, forestry and minerals production*); and to link that localized production to regional and global markets through trade using efficient transport infrastructure connecting to logistics and trade hubs that supply domestic and regional markets, as well as to gateway ports for international trade. Hence, the Development Corridor and Spatial Development Initiative settings provide for synchronized and coordinated public and private sector investments. Furthermore, Spatial Development Initiative settings provide for local economic development and social services delivery programs to be integrated and coordinated with the large scale and macro-economic setting of the host Development Corridor. In that way, growth, development and positive social transformation can be realized concurrently with poverty reduction.

7.2 Key Areas of Growth and Capacity Development for Industrialization

In terms of the 2nd FYDP of Tanzania, the national industrial development strategy is recommended to be implemented using Development Corridors as the integrated framework for implementing a strategy that seeks to integrate and synchronize national composite development with poverty reduction on a regional scale as the total impact of achieving success in the following key areas of growth and development that will bring about positive socio-economic transformation:-

- a. **Development of Industrial Production Capacity** – Through the establishment of a manufacturing and processing platform to create a value chain that will create reliable and stable markets for the primary production activities. In that way, investments and production will increase with resulting higher levels of income and consumption which in turn will create effective demand for the industrial sector;
- b. **Development of Human Capacities for Industrialization** – Through transfer of technology and skills to transform the largely agrarian and poor society of Tanzania engaged in the production of low value commodities with corresponding low productivity and income levels, to be transformed into an industrial society engaged in high value production with capacities for industrial innovation that can sustain competitiveness in industrial quality and productivity while enjoying rising incomes to reduce poverty;

- c. **Development of Trade Capacity in Industrial Goods** – To be achieved through the development of business infrastructure of trading enterprises and networks with capacities to market, transport, warehouse as well as to promote domestic and export sales of products that will be manufactured and processed by the domestic industrial sector;
- d. **Development of Economic Services Infrastructure** – To be realized through public investments or public-private-partnership (“PPP”) structures and private-finance-initiatives (“PFI”) to develop, design, build, operate and maintain roads, railways, ports, airports, electric power stations and transmission, gas supply, water treatment and supply, sewerage and telecommunication;
- e. **Development of National Innovation Systems (“NIS”)** – to promote innovation for economic development as a necessary condition for building national capacities to adapt the technology which will be received with the industrialization collaboration;
- f. **Development of Financial Services** – to provide financial intermediation for investment in capital projects as well as to fund trade and productive sectors of the domestic economy; and
- g. **Development of Local Business Infrastructure** – in the form of small, medium and micro enterprises that will provide local participation in the economic production services as well as the provision of services to industrial investors as suppliers, main contractors and sub-contractors to large scale construction projects and production enterprises.

All in all, the Development Corridors and SDIs provide an integrated development framework that will also promote synergies in socio-economic development initiatives that can exploit the inherent advantages and efficiencies of economies of scale, for economic enterprises and infrastructure projects which can straddle sovereign or regional and district administrative boundaries or borders. In that context, it is the economic imperatives and market forces, rather than narrow social group interests that will determine the physical location and dispersion of industries with a view to maximize economic efficiency.

8 THE CRITICAL ROLE OF THE ENGINEERING PROFESSION IN INDUSTRIAL DEVELOPMENT

8.1 Man as the Causative Agent of Industrial Development

Production and economic development as a whole, stems from the ingenuity of Man; in applying various skills with tools which are used to manufacture or process raw materials into intermediate products for assembly to finish, or directly into final value-added products for the markets. It is Man that makes use of acquired scientific knowledge to invent technology that is applied in the form of innovation for economic development for production, as well as to render economic and social services to society. It is this typical ingenuity of Man which unlocks the inherent economic potential hidden within Natural Capital and adds value – *say value in terms of utility, function, aesthetics or energy release* – that is termed **Human Capital** per excellence.

8.2 The Primacy of Engineers as Human Capital

In other words, the primacy and leading role of Human Capital to initiate, to manage and to maintain industrial development should be evident and cannot be overemphasized. The recovery of Germany and Japan from the ashes of economic and physical devastation of World War II leads to the evidence-based conclusion that, fundamentally it is the quality of Human Capital which determines the resource allocative efficiency as well as the technology adaptive and innovative capacity essential for sustainable industrial progress and development. Going forward, Tanzania must grasp this key lesson and give priority to investing in Human Capital as the most important factor of industrial development.

Since the main thrust of the 2nd FYDP will be industrialization, it can be stated that the failure or success of that plan which is intended to enable achievement of the TDV 2025 will depend in the main on the acceptance of the engineering profession to assume responsibility to rally all the members to be at forefront in implementing the national industrial development plans. It is the engineers who will develop and ultimately embody the national adaptive capacity for technology acquisition and application, as well as industrial innovation capacity for economic development. In that regard, active participation of the engineering profession should start with involvement in the planning stage and go all the way to effective implementation in their respective areas of professional specialization and specific responsibilities. To state the same thing differently and succinctly – success in the aspiration of Tanzania to become an industrialized Country is in the hands of the engineering profession more than any other single professional group.

9 KEY CHALLENGES AND THE WAY FORWARD

9.1 The Physical and Socio-economic Cost of Industrialization

Industrial development entails socio-economic transformation that has multiple and far reaching ramifications which are political, economic, social and with lasting impact on the bio-physical environment. As a matter of fact it is not possible for a primarily agrarian and rural based society such as Tanzania to achieve industrial development without what was termed by the renowned economist Joseph Aloys Schumpeter as “creative destruction” of the existing socio-economic structures and relationships.

There are the obvious key challenges of mobilizing capital investments for the desired pattern of industrial development, as well as the development capacities for acquisition of technology management and applications. There are other challenges in relation to instituting the various aspects of governance and regulatory regimes, as well as public policy reforms which are investor friendly and facilitative for development of the industrial sector.

Tanzania will have a national plan for industrialization that will be the blueprint of the coordinated effort to achieve growth with poverty reduction and sustainable development that will seek to have efficient resource allocation and implementation strategy to synchronize public and private sector investments,

as well as to coordinate and synchronize investments in inter-dependent economic services infrastructure delivery and human capacity building to support industrial and related trade activities.

It is beyond the scope of this presentation to enumerate and look into all the consequential challenges of industrialization. However, since all meaningful development must be anthropocentric i.e. “Man-Centered” it is important to make a specific mention of the challenges to minimize the adverse impact of the physical displacement and relocation of human habitat which takes place whenever agrarian rural communities are required to give way to the development of the physical infrastructure for industries. The transformation of rural communal settlements into urban communities is both profound in its social ramifications as well as the economic costs of building and maintenance of the multipurpose supportive infrastructure.

10 CONCLUDING REMARKS

10.1 15 Year Economic Performance and Main Objectives

During the FY 2015/2016, Tanzania will launch its 2nd FYDP that will have industrialization as its main thrust intended to move the Country out of the perennial poverty trap of a weak agrarian economy characterized by low technology and inefficient production methods with consequent low per capita income levels. The main objective of the 2nd FYDP is to transform and expand the economic base of Tanzania to become a semi-industrialized Country characterized by middle level per capita income level that is projected to reach US \$ 2,500 by the year 2025. In that regard, Tanzania has identified key industry sectors that will unleash the latent potential for rapid growth and spearhead the desired high growth rate and economic transformation for poverty reduction over the next decade and beyond.

10.2 Industry Development and Links to Relocation from China and Asia

Following economic reforms of the last two decades, the economy of Tanzania has achieved and maintained a steady growth of 7% year-on-year with relatively low inflation rates. As a consequence of those visible achievements, there is a growing consumer class that has created demand for industrial goods, while the local manufacturing sector has not been growing fast enough to meet domestic needs and to create value-added production chains that would enhance the export sector in order to maintain a healthy balance-of-payments and a positive external current account. Therefore, there are fundamental economic motives for Tanzania to seek rapid growth in industrialization that will create the supply-side base for a sustainable economy. This prevailing situation obtaining in Tanzania sets the basic scenario for industries from China and elsewhere to seek relocation and establish industries that would supply a vibrant captive domestic consumer market that is currently supplied by imports from China and other Asian economies such as Japan, India, South Korea and Thailand. An industrial manufacturing base that could be established to create a dynamic value chain and provide a reliable market for the primary production activities of agriculture, livestock, forestry and minerals extraction will add to the scope and

range of domestic production self-reliance, as well as enhance export trade capacity and growth with employment.

10.3 The China Industry Factor and Relocation to Tanzania

China is currently the leading industrial manufacturing economy in the World. However, there are certain domestic economic conditions that constrain China to seek for opportunities to partially offshore and relocate its manufacturing capacity. The gross industrial labour cost package in China has hit the global competitiveness ceiling of US \$ 200 per month for the labour intensive industries such as textiles and garments manufacturing which employ low-skilled and semi-skilled industrial workers. Hence, China is constrained to offshore such industries as an efficiency-seeking business strategy. For some energy intensive industries or other industries that use certain special raw materials or feedstock, it may prove to be economically more efficient to locate the manufacturing or processing facilities outside China, where the energy resources and raw materials are readily available at globally competitive rates. For example, it may be economically more efficient to locate an aluminium smelter or petrochemical industries in Mtwara where bauxite, coal and onshore natural gas could be available at relatively low prices rather than export the industrial inputs and natural gas to supply similar manufacturing and processing facilities in China.

Therefore, in considering the domestic economic conditions and driving factors as the basis for industrialization of Tanzania with investments from China, a mutually acceptable selection of **market-seeking, efficiency-seeking and resource-seeking industries** from China may be facilitated, encouraged and supported to locate to Tanzania, within the context of implementing the mutually beneficial, bilateral industrial development cooperation agreements.

ANNEXURE 1 – PROPOSED LIST OF PRIORITY INDUSTRIES FOR DEVELOPMENT IN TANZANIA

A1 Food Agro-processing Industries for Milling, Processing and Packaging

- Grains (e.g. *maize, rice, wheat, barley and millets*);
- Tubers (e.g. *cassava and potatoes*);
- Pulses (e.g. *beans, peas and other legumes*);
- Edible Nuts and Oilseeds (e.g. *cashew nuts, groundnuts, sesame, coconuts and sunflower*);
- Meat and Fish – meat cuts and meat products; fish fillets and fish products; poultry and poultry products;
- Horticulture Food Products – vegetables, fruits and mushrooms;
- Natural sweeteners – sugar, honey and their derivative products;
- Salts – rock salt and sea salt;
- Dairy Products – milk and milk products;
- Beverages – beer, soft drinks, organic juices, coffee, tea and cocoa;
- Natural Food Additives – spices and culinary herbs.

A2 Textile, Apparel and Beauty Products Industries

- Textile materials and Textile products;
- Garments;
- Leather and leather goods/products;
- Lapidary, ornaments and jewelry;
- Cosmetics and Fragrances.

A3 Building and Construction Materials Industries

- Cement and cement/concrete products;
- Bricks and building blocks;
- Construction Steel Girders, Steel Ropes, Plates, Fasteners and Reinforcement Bars;
- Wall Protection Paints, Wallpaper and Roofing Materials;
- Construction Stones, Decorative and Paving Stones;
- Building Construction Glass and Decorative Glass/Glassware;
- Construction Aggregates;

- Dimension Building Stones and Decorative Products – marbles and granites;
- Gypsum Building and Decorative Products;
- Wood Building Columns, Panels and Decorative Products;
- Sanitary ware, ironmongery and plumbing accessories;
- Household electrification materials for wiring and lighting.

A4 Pharmaceutical and Medical Equipment Supply Industries

- Malaria and Tropical Diseases Drugs;
- Vaccines;
- Antibiotic Drugs;
- Medical Consumable Supplies – e.g. bandages, gauze, plasters and surgical gloves;
- Medical Diagnostic Equipment and Machinery;
- Medical Surgical Equipment and Machinery.

A5 High Value Intellectual Capital Industries

- Biotechnology Industries;
- Industrial Materials and Product Innovation Centres.

A6 Basic Capital Intensive Manufacturing and Processing Industries

- Industrial Base Load Electric Power Generation and Bulk Supply;
- Industrial Gases Production and Bulk Supply – e.g. oxygen, carbon dioxide and acetylene;
- Natural Gas Liquefaction for Export Markets (“LNG Plant”) and for Domestic automotive fuel;
- Industrial Minerals Beneficiation – e.g. iron, nickel, copper, manganese, cobalt, phosphates, tin, aluminium and titanium;
- Industrial Minerals High Value Production Industries – e.g. Titanium Dioxide Paints; Aluminium Products; Copper Wires, Plates and derivative products.
- Iron and Steel Production – e.g. nodular cast iron; steel long products; alloy and special steels; steel products (*containers, wires, ropes, plates, rods and bars*);
- Basic Petrochemical Industries – i.e. coal and hydrocarbons downstream industries to produce methanol and derivative products; ammonia, urea, coal-to-liquids and gas-to-liquids fuels; and other synthetic materials from petrochemical building blocks;
- Basic Chemical Industries – to produce industrial inorganic chemicals and their downstream derivative or associated industrial products e.g. soda ash and downstream products such as glass; sulphuric acid; nitric acid, phosphoric and hydrochloric acid;
- Petroleum Refining and Lubricants Production/Blending.

A7 Consumer Durable Goods Production – Component Manufacture and/or Assembly

- Domestic Appliances (e.g. *cookers, catering equipment, refrigerators and air conditioners*);
- Office and Household Furniture;
- Office Equipment (e.g. *computers, printers and e-Commerce hardware*);
- Household Utensils (e.g. *cookware, crockery and chinaware*);
- Consumer Electronic Goods (e.g. *laptop computers, television receiver sets, audio-visual entertainment equipment, cellphone handsets, and e-Notepads*);
- Private automotive vehicles and Motorized Riders.

A8 Capital Goods Production – Component Manufacture and/or Assembly

- Farm Equipment and Machinery;
- Irrigation Equipment and Machinery;
- Commercial Transportation Automotive Vehicles – e.g. Trucks with Trailers; Tipper Trucks; and Buses;
- Construction Plant and Equipment;
- Railways Locomotives and Rolling Stock;
- Machine Tools and Metal Fabrication Plants or Equipment;
- Industrial Electronics Goods and Equipment – e.g. Process Control Equipment; Quality Control Equipment and Metering Equipment;
- Maritime Shipping Vessels;
- Fishing Boats and Commercial Fishing Vessels;
- Mining Plant Equipment and Machinery;
- Fixed and Mobile Telecommunication Equipment;
- Aircraft; Aircraft Services and Aviation Industry Plant, Machinery and Equipment.