



Role of Research in Manufacturing and Processing As added Value to the Economy

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Abstract: The aim of this paper is to cast some shadow on the policies of research with regards to socio-economic development of the nation. It will high light some points for taking the results of scientific and technological studies from the research level to implementation at the business level. It will specifically emphasize how to realizethe added value to the economy by applying scientific and technological knowledge in manufacturing and processing of agriculturalcrops and other raw materials available in the country.

1. INTRODUCTION

Sudan is very rich of natural resources. The area of the country is about 1,890,000 sq. km. There are diversified types of soil and various landscaping. There are various sources of river water, rainfall as well as underground water. The climate varies from semi-equatorial in the south, to savanna in the middle, arid and semi-arid in the north andMediterranean climate in the Red Sea coast. There is relatively large population in the country (about 33.5 million) of diverse ethnic origin, culture and different ways of life.

The big area and the great natural resources endow Sudan with uniquepotential for many types ofproduction in agriculture, animal wealth and forestry. Also, there are large resources for many minerals as well as oil and gas onshore and offshore which invite investment and business.

2. Concept of Added Value

The idea of added value in economy is to add value to materials by transforming them from initial raw state to finished commodities ready for consumption or for use as inputs to produce other consumable goods.

The benefit of added value in economy is not limited to this simple idea.It also contributes considerably in many ways in the socio-economic development. This can be envisaged from the following aspects:

- Increasing the selling price of raw materials by transforming them into finished goods;

- Manufacturing and processing activities create jobsin other economic sectors like trading, transport, commercial services, finance services, consulting services, etc;
- Creating employment chances for work force hence generating income to the community;
- Contributing to capacity building through professional and vocational training of people involved in the business;
- Procuring hardware and software routines for production transfers technology and expertise to the country;
- Providing the state treasury with sizeable revenue through taxes, custom duties, service charges, municipal levies, etc;
- Contributing to social responsibility programs by paying Zakat, giving donations and participating in national functions and public activities.

2.1. Added Value for Sudan Economy

The optimum economic value of the natural resources in Sudan cannot be attainedwithout manufacturing and processing of raw products and materials. This is necessary to produce products and goods of high value from the initial materials for the international and local markets.

There are local industrieswhich are mainly activein food production and manufacturing of some raw materials to make consumer goods for the local market and semi-finished products for the international markets. The production in sugar sector and processing of vegetableoils

has been developed over a long period of time. The processing of agricultural crops, fruits and vegetables, animal products and manufacturing of minerals and other mining materials are lucrative areas for technological work and business development.

2.2. Examples of Added Value form Sudanese Resources

There are many agricultural and animal products as well as minerals which can be of very high value if processed to produce finished products.

Let us take the example of cotton and assume the price of one kg of raw cotton in the international market is about 3 USD. If this cotton is processed into fine yarn of high count, the value may be about 10 USD. If the yarn is woven into fine, mercerized and highly finished fabrics, the value may rise to about 30 USD. And if this fabric is used to make garment, the value may jump over 50 USD.

This means that the value of cotton can be multiplied by ten-folds through manufacturing it as a final consumable good. Moreover, the manufacturing and processing business has great impact on the economy and society by employing many people, activating other economic sectors, contributing fairly to the public treasury and helping general public welfare.

The other example is Acacia Gum. Sudan is the home of Acacia Senegal and Acacia Seyal gums as well as tens of other acacia gums. The western markets discovered the value of these gums long time ago; and still they are main buyers of our gums, they process and sell it to the rest of the world. It is evident there is very lucrative business in these acacia gums.

There is a lot of research done on Acacia gums and proved it is a safe, useful and effective material for many health and medical treatments. Hence, many products can be developed from Acacia gums for health food and medical treatment as well as many other applications. It is definite these products are of very high value compared to the value of raw gums.

Like Acacia gums, there are many other products of medicinal and herbal plants which are available in diversified qualities and large quantities.

There is high economic return which can be generated by manufacturing and processing Sudanese products and raw materials to produce high value goods.

3. Sudan Strategy for Industrialization

Sudan has started strategic planning since 1992 by the Decade Strategic Plan (DSP) 1992 -2002; then made the Quarter Millennium Plan (QMP) 2007-2032. The QMP is designed to be implemented by 5 five-year programs, the second of which starts in the current year 2012.

The QMP targets the socio-economic development on basis of science and technology by emphasizing Research and Development as one of the main components of the plan. The implementation plan is supposed to include projects for research and development in all sectors. If science and technology are implemented in manufacturing and

processing of materials, large value will be added to the economy of the country.

It is imperative for the concerned parties in government and community at large to give priority to implementation of research results in manufacturing and processing so as to add value to our production.

It is the responsibility of universities and research institutions to include in their programs pilot projects for implementation of research results in the sectors of manufacturing and processing. At this time, the country is in acute need to adopt policies of sustainable economy which can only be attained by making added value to the renewable and huge resources. Hence, the government should support implementation of scientific and technological research in production.

4. Investment Policies

The government has done great effort to encourage investment in the country. The investment act and regulations have been revised and updated many times for more improvement. The general investment climate has been relatively improved although there are some shortcomings.

The investment law encourages investors to transfer technology and modern techniques for production and business.

The studies of investment prospects and scientific preparation of projects are very important for promotion of investment. The investment authorities should coordinate with the universities and the research institutions for preparation of investment profile and production studies.

5. Role of University and Research Institutions in Manufacturing and processing

5.1. Academic Qualifying and Training

Beside qualifying scientists, engineers, technologists and technicians, and extending extra qualifying services by running diploma courses to build capacity for professionals, the university and research institutions can play essential role in providing business with many facilities to serve its basic needs.

The universities run many diploma courses in different disciplines and professions. It is a necessity for the universities to coordinate with business community for designing these courses in the specializations which serve the production and business purposes.

Universities can also conduct special capacity-building programs to upgrade the senior and professional staff in manufacturing and processing business.

5.2. Research Work

Some research programs run by the university and institutions have to be directed to indigenous issues and concerns, e.g.:

- study characterization and functionality of local agriculture and forest products,

- improvement of post-harvest and preparation processes of crops and fruits,
- product development from local materials,
- modification of existing manufacturing and processing systems,
- solution of production problems, etc.

The research policy in university and institutions must be based on the business need in the manufacturing and processing entities. This requires close contact and coordination between the university and institutions for mutual introduction to their work to each other. I believe there are many viable chances for cooperation between them.

The university and research institutions are supposed to disseminate the research results to the community, particularly the manufacturing and processing community as well as to the government parties. This is important for informing these people about what is going in the research institutions and what is available for implementation in manufacturing and processing business.

U of K can take initiative to arrange regular seminars and meetings, about research findings in various fields of specialization, with the business community and the government agencies. They can also publish periodicals to disseminate research works to the concerned parties in the private and government sectors.

This dissemination of research results helps promoting and introducing university and institutions to the business community and entices them for cooperation.

The manufacturing and processing community will then approach the university and institutions to coordinate for problem solving and process development.

This sort of cooperation and integration between the concerned parties will develop the business for mutual benefits for all parties and the country as a whole.

5.3. Technology Transfer:

The process of technology transfer is very essential for the development of the country. There are many ways for transfer of technology. The universities and research institutions can play some role in technology transfer through cooperation with international universities and research institutions. The technology starts from research and developed into techniques and routines for production and business. The close cooperation of our universities with the international universities and institutions is fairly useful for technology transfer.

6. Proposal for Cooperation between Research and Business

A lot of research is conducted by Sudanese scholars in Sudan and abroad in many areas of production and development. Some of these research works are very useful for economic and social development. However, most of

these researches are kept in periodicals or thesis shelved in libraries.

Sudan is in need of the findings of research in science and technology to optimize utilization and value of its large natural resources. Scientific research and technology is the only way for developing business and welfare of the community. Hence, Sudan has to depend on research and technology to build competitiveness in the international business and community.

To achieve this goal, I recommend establishment of a national body to be responsible for taking the findings of scientific and technical research from laboratory level to pilot projects, as step forward to implementation in business fields and the industries.

6.1. Proposal

I propose for the Faculty of Post Graduate Studies and Research Administration in the U of K to coordinate with the African Technological City (ATC) to initiate the idea of establishing a national body with the concerned government parties and the private sector.

This body is to involve the private and public business entities, the universities, the research institutions, the government ministries responsible for economic planning, science & technology, high education & research, real sector, infrastructure and services.

6.2. Objectives and Functions

The objectives and functions of this body are the following:

- Review the scientific and technological research with the universities and institutions and select works viable for implementation in business fields and industries.
- Promote the viable works to business enterprises in the public and private sectors.
- Coordinate between the business enterprises and the institutions which have prepared the research selected for implementation as pilot project.
- Liaise between the research institutions whose research is selected and business enterprises opting to benefit from the research.
- Prepare technical and economic feasibility studies for the technically sound projects.
- Liaise with banks and financial institutions for financing feasibility studies and project preparation.

6.3. Funding:

The activities conducted by the proposed body are to be financed by the private sector, the public enterprises, the banking system and the government. The body is supposed to promote and market the feasible pilot projects to investors and business enterprises and charged them the cost of preparing these projects.

The body is supposed to repay the finance from the revenue collected from the benefiting enterprises.