

8 71
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY



Book of Proceedings



**BIENNIAL ENGINEERING
CONFERENCE**

Theme:

**DECAY IN INFRASTRUCTURE - A CHALLENGE
TO SCIENCE AND ENGINEERING RESEARCH
IN REALISING VISION 20-2020**

Date: 26th - 28th June, 2008

Time: 10:00am

Venue: Federal University of Technology,
Main Campus, Gidan Kwano,
Minna, Niger State, Nigeria.

PROCEEDINGS OF THE 1ST BIENNIAL ENGINEERING CONFERENCE (BEC' 08)

Held at the School of Engineering and Engineering Technology of the Federal University of
Technology, Minna Main Campus

on

26th – 28th June 2008

**THEME: DECAY IN INFRASTRUCTURE – A CHALLENGE TO SCIENCE AND ENGINEERING
RESEARCH IN REALISING VISION 20 – 2020**

Members of the Local Organizing Committee

Dr. M. O. Edoga	Chairman	Chemical Eng. Dept.
Mr. A. Mukhtar	Secretary	Chemical Eng. Dept.
Dr. E. N. Onwuka	Member	Elect/Comp. Eng. Dept
Dr. J. Tsado	Member	Elect/Comp. Eng. Dept
Dr. J. O. Abu	Member	Agric Eng. Dept
Dr. V. I. Ogwuagwu	Member	Mechanical Eng. Dept
Mr. O. J. Okegbile	Member	Mechanical Eng. Dept
Dr. O. Chukwu	Member	Agric Eng. Dept.
Dr. S. M. Auta	Member	Civil Eng. Dept.
Dr. B. A. Alabadan	Member	Agric Eng. Dept.
Mr. A. A. Aboje	Member	Chemical Eng. Dept.
Mr. P. Idah	Publicity Chairperson	Agric Eng. Dept.
Engr. J. I. Agwuwa	Member	Civil Eng. Dept.
Mrs. W. Yahya	Protocol Chairperson	Chemical Eng. Dept.
Engr. F. Atume	Member	Registrar COREN

Co-opted Members

Engr. J. O. Okafor	Technical Secretary	Chemical Eng. Dept.
Mr. C. Chukwudozie	Member	Chemical Eng. Dept.
Mr. U. Musa	Member	Chemical Eng. Dept.
Engr. L. I. Onyeji	Member	Chemical Eng. Dept.
Mr. J. Ochoje	Member	Chemical Eng. Dept.
Elder M. A. Olutoye	Member	Chemical Eng. Dept.

CAROLINE O ALENOGHENA

Department of Electrical & Computer Engineering
Federal University of Technology, Minna
Email: alenca2@yahoo.com

ABSTRACT

Vision 20-20-20 is the vision of the present administration for the future of our country. With a view of making Nigeria one of the twenty leading industrialized nations of the world by the year 2020. A promising and flourishing SME would solve some of the industrialization problems of developing countries which includes infrastructural and raw materials development. Transformation of natural resources into economically beneficial products in order to create wealth and employment require the application of science and technology. The realization of Vision 20-20-20 lies in the collaboration of the small and medium scale enterprises and the universities. Many of the engineering departments in the polytechnics and universities are littered with prototypes of equipment, appliances and devices that could be of immense use to the communities if such prototypes are further developed to the finishing stage. What is proposed is that the SMEs in developing countries with the collaboration of the relevant university faculties and departments can make vision 20-20-20 a reality.

KEYWORDS: *Small and medium scale enterprises (SMEs), Industrialization, Development*

INTRODUCTION

Nigeria, which was one of the richest 50 countries in the early 1970s, has retrogressed to become one of the 25 poorest countries at the threshold of the twenty first century (Ighuor, 2006). It is ironic that Nigeria is the sixth largest exporter of oil and at the same time host the third largest number of poor people after China and India. Nigeria fares very poorly in all development indices. The average annual percentage growth of GDP in Nigeria from 1990 -2000 was 2.4. This is very poor when compared to Ghana (4.3) and Egypt (4.6). Poverty in Nigeria is in the midst of plenty. Nigeria is among the 20 countries in the world with the widest gap between the rich and the poor.

In the developed countries, the small and medium-scale enterprises, SMEs, constitute about 70 per cent of the production sector in terms of employment offered, hence are the engine of growth in their economies. In the United States of America, for example, over 70 per cent of the input of their automobile industries is the products of their small firms (Adediran 2006). The situation is similar for India and, particularly, the emerging Asian economies, known as the "Asian Tigers". Encouragement of SMEs has been regarded, in these countries, as an integral part of industrialization of

most other less developed countries (LDCs) India, in particular, has been able to make a giant stride in her industrialization process through the development of small-scale industries, which most are located in rural communities. Rural communities make up over 60% of the land mass area of Nigeria, resulting in over 60% of the nation's over 100 million living in rural areas. The rural communities unfortunately have been faced with neglect resulting in urban migration giving rise to overpopulated cities.

Traditionally, universities are set up for research in basic/applied sciences as well as education of future scientists, engineers and technocrats. The researchers concentrate more on publication of technical papers that will give them positive assessment towards their career progression due to the publish-or-perish assessment criteria. No wonder many of the engineering departments in the polytechnics and universities are littered with prototypes of equipment, appliances and devices that could be of immense use to the communities if such prototypes are further developed to the finishing stage.

SKILLS PECULIAR TO RURAL COMMUNITIES

There are certain indigenous skills and crafts that make our identity unique, and are in the verge of extinction. A review of the education policy and encouragement of university-SME collaboration to assist the rural communities will revive and modernize these skills and trade, and create wealth for the nation. The Indians are known for their unique cloth embroidery, the Italians for their leather works and the Chinese for their herbs. These countries are making waves today by virtue of developing their rural communities. Nigeria is blessed with trades and crafts peculiar to our various rural communities which the university can help the SME develop.

Some of these include:

- 1 Weaving (special traditional cloths, basket making gift items,
- 2 Dying (adire, Sheda etc)
- 3 Blacksmiths and Gold smiths
- 4 Pottery
- 5 Agric and agro allied products

Today, most of these arts and trades, in the rural communities are still carried out in the same old fashion way as 500 years ago without improvement, or modernization. The young generation dissociates themselves from such art or trade carried out in such primitive way.

The non-development of our unique local skills can be attributed to the fact that researchers in higher institutions of learning and the industries are operating as separate "islands".

PRESENT EFFORTS AT POVERTY ALLEVIATION THROUGH SMES

Nigeria today is not lacking in the right human and material resources to effect her homegrown economic development. Bringing these resources together in the right quantum and proportion to operate in harmony is what we require. Some of the major efforts at empowering the SMEs include the following:

The federal government recently introduced the National Economic Empowerment and Development Strategy (NEEDS). One of the strategies of NEEDS is the development of the private sector as the engine of growth for wealth creation, employment generation and poverty reduction, especially through SMEs.

Technology Business Incubation Centers (TBIC) exists in the country to assist in the establishment and nurturing of indigenous technology-based SMEs for employment generation and wealth creation in line with NEEDS. The TBICs are in state capitals and rarely work in collaboration with the neighbouring institutions of higher learning. This has resulted in slow growth rate and little impact on the economy.

National Office for Technological Acquisition and Promotion (NOTAP) keeps a store of patent records. Technological information contained in scientific journals and patent (documenting contributions from researchers and inventors all over the world) plays a dominant role in the development of indigenous technologies through assimilation and adaptation of foreign technologies.

Proposed Micro Finance Banks which is aimed at putting an end for the funding issue in SMEs is still awaiting full implementation.

LIMITATIONS TO UNIVERSITY/RURAL SME'S TECHNOLOGY COLLABORATION

Some of the obstacles limiting the success of Collaboration between the Universities and SMEs and eventually economic breakthrough of developing countries are as follows:

Universities, by law, are not allowed to engage in commercial activities. Hence, research efforts end up as prototypes because the immediate communities may not be aware of the existence of such efforts.

Lack of awareness of University capability, today several machines have been developed by students,

but the community not aware of such feat.

SUSTAINABLE DEVELOPMENT BY UNIVERSITY-SME COLLABORATION

Low level of funding of universities and research institutions.

Government's ownership of research institutions,

Discouraging role of the industries, inadequate public awareness on research capabilities,

Effect of importation.

Most rural communities lack basic amenities for successful operation of SMEs. These include, electricity, good roads, water and communication facilities.

THE WAY FORWARD

Vision 20-20-20 will become a mirage if we fail to do all we can now to make the engine of development strong and viable.

As a matter of urgency Nigeria needs to develop an industrial development policy that nurtures entrepreneurial activity and helps diversify the dependence on primary commodity exports. These could be attained by applying the following recommendations

1. Reform of the mandates of tertiary and research institutions to encourage the researcher to become entrepreneurs by organizing exhibitions with a mandate to trade the products following laid down procedures
2. Make TBIC university based and encourage networking with SMEs in rural areas
3. More determined approach is essential for technological development by making SMEs development rural based
4. Provision of basic amenities to rural communities by government at all levels.

REFERENCES

Abubakar A.: *Making R & D major instrument for the actualization of needs* NASME 2005 conference, Abuja October 2005.

Adediran Y.A, Alenoghena C.O., *Technology Transfer and small-medium scale enterprises in Developing Countries*: IC DEN 2006 conference September 10th -15th 2006

Essien O. E.: *The role of technology in Needs* NASME 2005 conference and Exhibition October 2005.

Nigerian investment promotion commission (NIPC) handbook: *Investment Incentives in Nigeria*.
<http://www.nipc-nigeria.org>

National office for Technology Acquisition and promotion handbill: *Patent Support Service To Smes*. Published by Patent Information and documentation Centre (PIDC) Wuse, Abuja.

National office for Technology Acquisition and promotion handbill: *Patent as an innovation tool for researchers, investors etc*. Published by Patent Information and documentation Centre (PIDC) Wuse, Abuja.

Office of the Special Assistant to the President on Economic matters: *Developing small and medium enterprises for*