RAW MATERIALS RESEARCH AND DEVELOPMENT COUNCIL

RMRDC

ENGINEERING ECONOMY AS A KEY DRIVER FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

BEING A LEAD PAPER PRESENTED AT

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BY



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Outline of Presentation

1.0 Development Plans in Nigeria

2.0 Sustainable Development

3.0 Engineering Economy as a Key Driver

4.0 Challenges in Applying Engineering Economy

5.0 The Way Forward

6.0 Conclusions

OBJECTIVES OF THE PRESENTATION

This paper examines the role engineering economy in planning and execution of national engineering based projects. It shows that sustainable development can be achieved in Nigeria if engineering economy can be applied in development projects.

Transformation agenda (power, transport, agriculture, health, science and technology) can succeed if these principles are applied during project planning, execution and monitoring.

1.0 Development Plans in Nigeria

- From independence in 1960 till date, a number of development plans have been formulated and implemented in Nigeria. Examples:
- 1st National Development Plan (1962 – 1968)
- 2nd National Development Plan (1970 – 1974)
- 3rd National Development Plan (1975 – 1980)
- 4th National Development Plan (1981 – 1985)

- 2 year rolling plans (1990 – 1992, 1993 – 1995):
- Structural Adjustment Programme (1986)
- National Economic Empowerment Development
- Strategy (NEEDS) of 1999
- 7 point Agenda (2007)
- Vision 2020
- Transformation Agenda (2011)

Many projects have been executed within the purview of these plans.

Development Plans CONTD

- The question is “how successful have these projects been?”
- A number of successes have been recorded e.g. roads, water, electricity, airports etc in most major cities in Nigeria
- Also, over 100 institutions of higher learning, hospitals, and other modern infrastructures
- However, there are distortions and paradoxes in the development efforts
- This is because most of the projects were not executed in a sustainable manner due to lack of application of engineering economy principles as the key factor in choice, planning and implemetation of the projects

2.0 Sustainable Development

- Sustainable development is one that takes care of the needs of today without compromising the ability of the future generation to take care of their needs
- Nigeria has never been lacking in development plans
- But how do we make these plans and the projects associated with them sustainable

How Sustainable Have these projects been in Nigeria

Housing schemes, Railways, Highways (roads),

Water ways, airports, seaports, Tourism, Water projects
Schools (primary, secondary, tertiary), hospitals, satellite,

Manufacturing Industries, service industries, Gas, Refineries
Agricultural development projects, R&D, Defense, Electricity

3.0 Engineering Economy as a Key Driver for Sustainable Development

- Appropriate decision making to ensure sustainability of projects
- Decision with respect to human, material, financial and time resources
- Economic success occurs when cash in flow is greater than cash outflow

Measures of success (Engineering Economy)

- Net present value (NPV)
- Pay back period (PP)
- Internal Rate of Return (IPR)
- Profitability Index (PI)
- Accounting Rate of Return ARR)
- Accounting Ration (AR)

•These can be used in association with Project Management Techniques to ensure sustainability

-Project Evaluation Review Technique (PERT)

-Critical POath Method (CPM)

• Sustainability is achieved when economic success is sustained over a reasonable length of time without environmental degradation

Key Drivers of Sustainability In Engineering projects

S/N	Consideration	Relative Weight (%)
1.	Social	10
2.	Political	5
3.	Environmental	10
4.	Technological	30
5.	Project Management Technique	10
6.	Engineering Economy	35

4.0 Challenges

- Corruption
- Political interference
- Poverty
- Inadequate resource allocation (Labour, materials, money, time)
- Poor access to technology
- Lack of effective legislation and regulation
- Poor project Management, Monitoring and Evaluation (M&E)
- Undue imports and dumping

5.0 Way Forward

- Every engineering project in Nigeria must be designed and implemented with sustainability in mind
- This sustainability can be achieved by application of principles of engineering economy
- Every engineering training programme curriculum in Nigeria must have a component of engineering economy
- Practicing engineers should undergo continuous engineering education in the area of engineering economy
- There should be a mechanism for monitoring the use of engineering economy in project design and project management in Nigeria

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6.0 Conclusion

- We have shown that one major reason for failure of major engineering projects in Nigeria is non application of engineering economy to the design and management of the projects
- It is suggested that every major project should have a project management platform that must include a judicious application of Engineering Economy
- This can lead to sustainability of projects in Nigeria, hence ensuring success of the current administration's Transformation Agenda

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