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INVESTMENT METHODOLOGY IN PLANNING AND DEVELOPMENT OF INFRASTRUCTURE: AN UNBALANCED GROWTH APPROACH

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Abstract
The economic as well as efficient use of scarce resources is one of the challenges in developing countries. This paper aims at providing an investment methodology to infrastructure planning and development agencies. To achieve the goal, the paper specifically analyses the unbalanced growth concept in prioritizing investment in infrastructure development. It further examines in detail the investment policies in infrastructure development in Sri-Lanka. Based on that, this paper carried out an extensive survey of the literature pertaining to available social infrastructure and the social status of Nigerian Niger Delta (ND) region. In looking for broad correlations, this paper sets aside a crucial issue - given that investment capital is scarce and living standards are low, what should get priority in terms of investment between consumption and productive activities? The study employed. An adaptation of photovoice methodology is used to collect primary data on the status of infrastructure facilities in the ND. The methodology is adopted to identify scope not captured through quantitative measures. The methodology combines photography with grassroots social action through interviews. The sample size is based on purposive sampling technique because the methodology requires adults that can participate in interview survey and handle instruments to be used for data collection. Based on that, fifty seven participants were first selected and subdivided into eight groups. The findings establish that social overhead capital (SOC) investments are more beneficial than direct productive activities (DPA) during early phase of infrastructural development and thus be given priority because the provision of SOC is relevant to addressing the appalling state of living of the people of the Nigerian ND region and thus improve the region's human capacity. The paper concludes that the measure of self-reliance of poor people is a strong indicator of the long-term poverty reduction impact of infrastructure development. Policy recommendations and specific actionable targets are suggested.

Keywords: Unbalanced growth, Social overhead capital, Infrastructural planning and development

INTRODUCTION

Analysis of Strategy of unbalanced growth

According to the theory propounded by Albert O. Hirschman, no developing country has sufficient endowment of resources as to enable it invest simultaneously in all sectors of the economy in order to achieve balanced growth (Jain & Ohri, 2007). Consequently, for this chronic scarcity of resources to be economically as well as efficiently utilized, a deliberate strategy of unbalancing the economy should be adopted and be included in the planning policies. The theory stresses investment in strategic sectors rather than in all sectors simultaneously. The other sectors would automatically develop through linkages effect (Jain & Ohri, 2007). Hirschman maintains that strategic sectors of the economy should get priority in terms of investment. Growth of these sectors will open new channels of growth in other sectors of the economy through externalities and complementaries (Jain & Ohri, 2007). For example, externalities in the sense that, the growth of industry A will generate the growth of industry B and C, while growth of output of A may generate the demands for the products of B and C. These are technical complementaries which stimulate growth of related industries, following the strategy of unbalanced growth.

Hirschman classifies investments into two parts namely SOC and DPA. SOC is termed as those basic devices without which primary, secondary and tertiary activities cannot function. This calls for expenditure on projects like roads, electricity, health care centres, water supply, schools and communications. On the other side, DPA are those activities which are a consequence of some investment, add to the flow of final goods and services. Investment in industry, plant, equipment is deemed as belonging to DPA (Jain & Ohri, 2007). As mentioned above, both SOC and DPA cannot be taken up simultaneously in less developed countries owing to the general lack of resources. Investment in SOC is advocated not because of its direct effect on final output, but because it permits and in fact invites DPA to come in. 'Some SOC investment is required as a prerequisite for DPA investment' (Familoni, 2008).

SOC can thus be seen from a variety of viewpoints that relates to productive capital, meaning that, capital that functions to indirectly enhance the production capacity of productive capital. This is in contrast with productive capital, which has an inherent direct production capacity.

Also SOC can be functions which although are essential to the health of the society, which are unlikely to be supplied in sufficient quantity by the market mechanism because of characteristics such as collective consumability of non-excludability. However, for the purpose of this study, SOC are the sectors that are essential to the health of the people, form foundation for industrial activities and act as an impulse to induce spontaneous private investment, consequently foster economic growth in the region. Furthermore, the author analyses this theory to draw the attention of infrastructure planners to investment priorities in early phase infrastructure development. Due to the fact that the provision of SOC is relevant to addressing the deplorable state of living of the people and can stimulate their potentials for sustainable livelihood. The author illustrates in the next section development path via provision of excess SOC.

In Figure 2.1, the path of development is demonstrated, using the strategy of unbalanced growth. The X-axis of the diagram shows investment cost in socially productive activities, while the Y-axis shows investment cost in direct productive activities. AA, BB and CC are equi-product curves, indicating various combinations of SOC and DPA corresponding to a given level of output or national income. The higher the curve, the greater is the level of output. In this sequence, if investment is first made in SOC, the economy will follow DEGHK as its course of development. Increase in investment of SOC from D to E will induce greater investment in DPA unto point F because infrastructure like transportation, electricity among others will become cheap and are now made available. Investment in DPA increases until balance is restored at G, in other words, the economy would be in state of equilibrium at point G. However, G is located at high equi product point BB. This implies increase in level of output in the economy. A further increase in investment in SOC up to point H would further induce investment in DPA from point G to J. This induces further investment in DPA until equilibrium is reached at point K on a higher iso-product curve CC indicating a higher level of output.

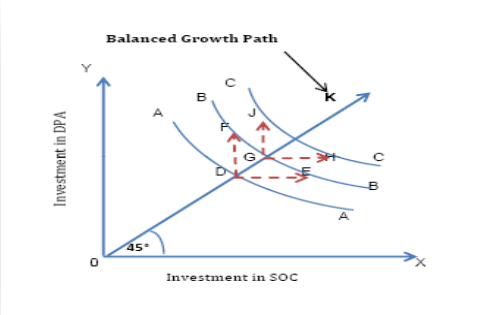

Figure. 2.1: Development Via Excess Capacity Of Soc
(Source: Jain & Ohri, 2007)

ANALYSIS OF INFRASTRUCTURE POLICIES

This section of the paper analyses the policy options and possible reform measures available to ensure that infrastructure planning and development manifest in the well-being of the people. To avoid likely problems, the author looks at other country' experiences in dealing with this issue.

Lessons from Sri Lanka

Sri Lanka may be worth looking at to illustrate how to achieve a suitable allocation of resources in infrastructure development. Sri Lanka has had a strong preference for investment in social infrastructure under its socialist economic system (Akatsuka & Tsuneaki, 1999). Economic infrastructure has been rather neglected, and as a result, the economy as a whole has seen little rise in productivity. This biased preference resulted in slow GDP growth, while the recurring budget for support of the social has risen (Akatsuka & Tsuneaki, 1999). Sri Lanka is far ahead her South Asian neighbours in the accomplishment of human development goals having her human development index as 0.751 (United Nations Children's Fund, 2012). In Table 2.1 life expectancy at birth is 76 years and 70 years for female and male respectively, this is close to the estimated lifespan in the developed countries. The literacy rate of 87% as indicated in Table 2.1 is high relative to her counterparts in the developing countries.

There is low mortality rates of 20 deaths per 1000 births as indicated in Table 2.1 and the steadily declining population growth, reflect the country's progress in the sphere of social development. Although, in the case of Sri Lanka, there are pros and cons, the lesson learnt is that the preferential investment in SOC has improved the social indicators such as life expectancy, literacy rate and infant mortality rate. The country is ranked as one of the highest in Asia in this respect. Meanwhile, on the other hand, the country has experienced very little rise in GDP

Table 2.1: Some social indicators of Sri Lanka

Case study	Life Expectancy F/M	Education Index	Literacy rate F/M	Infant mortality/1000	Accessibility to electricity	Accessibility to safe drinking water	Mortality rate un der 5 /1000 F/M
Sri Lanka	76(F)/ 70(M)	0.84	87%/ 93%	20	75% of population	89% of population	17/24

(Sources: United Nations Children's Fund, 2012 & Andrew, 2012)

INFRASTRUCTURE AND THE NIGERIAN NIGER DELTA

The lack of modern infrastructure is a major challenge to Nigeria's economic development and constitutes a major impediment to the achievement of the Millennium Development Goals (MDGs) (United Nations Development Programme, 2006). The positive relationship between infrastructure and economic growth is well-known, and requires little further elaboration. Ironically, however, the links between infrastructure and human development are often less recognized and are not enunciated in terms relevant to policy. Infrastructure provides people with services that they need and want. Access to water, sanitation, electricity, telephones, computers and transport make immeasurable difference in people's lives. The absence of some of the most basic infrastructure services often translates into absence of human development (Directorate of Institutional Finance & Sanket, 2007). Broadly, infrastructure impacts on human development in two ways: first, it supports the processes of growth on which much of poverty reduction depends; and second, it helps the poor access basic services which can improve their lives and income opportunities. At its best, infrastructure can draw poverty reduction, service provision, and growth into a reinforcing virtuous cycle (Directorate of Institutional Finance & Sanket, 2007).

Safe and convenient water supplies save time and arrest the spread of a range of serious disease such as diarrhea, a leading cause of infant mortality and malnutrition. Infrastructure lowers costs, enlarges markets, and facilitates trade. Electricity powers, health and education services and boosts the productivity of small businesses. Road networks provide links to global and local markets.

Roads, water and electricity are also essential to addressing the non-income elements of poverty, as reflected in the Millennium Development Goals, including access to education and health care, gender equality and environmental sustainability (Michael, 2007). Infrastructure also has an important impact on human development and poverty through growth. It is also an intermediate input into production. Without power and water, all but the most basic production would grind to a halt. It raises the productivity of factors of production— by generating the power that allows factories to mechanize, by allowing workers to get to work quicker, or by providing the networks through which information health can pass electronically. Infrastructure connects goods to markets, workers to industry, people to services, and the poor in rural areas to urban centres. Infrastructure lowers costs, enlarges markets, and facilitates trade. Infrastructure has a human development impact on the activities through which people earn their living. It contributes to the health and education that people need to fill jobs, or create them. It may seem intuitive that the ability of people to earn a living is increased when transport, information, power, and water are readily available (Directorate of Institutional Finance & Sanket, 2007). Health is one of the major determinants of labour productivity and efficiency. The impact of health services may be similarly affected by the ability of the poor to access facilities.

Even though human capital is only one factor of many that drives development and associated economic growth, it is an important factor for the development process for a developing country like Nigeria. The productive capacity of a country is related to the level of human capital, explaining why human capital formation must be considered of great importance in the future. Human capital is an important factor for the wealth of a nation due to its influence on the overall production of the country.

Technological progress can provide more efficient production-methods like machines and computers, but skilled labor is necessary to manage and develop them as well as to improve the quality and productivity of the existing labor. The Human Development Index (HDI) provides a measure of human capital development in three dimensions: income, health, and education.

The formation of Nigeria's human capital is therefore of great importance in the coming years if Nigeria wants to be competitive in the future. Table 3.1 below summarizes the Human development index (HDI) score; a measure of well-being encompassing the longevity of life, knowledge and a decent standard of living, remains at a low value of 0.564 points on a 1.0-point scale in the ND region.

Table 3.1: Some social indicators of Niger Delta Region of Ondo state

Case study	Life Expectancy F/M	Education Index	GDP Index	Infant mortality/1000	Accessibility to electricity	Accessibility to afe drinking water	Mortality rate under 5 /1000 F&M
Rural area in Ondo state NDR	47.9/(F) 46.8/(M)	0.575	0.512	120	34% of population	31% of population	206

(Source: Paul & Shonali, 2008)

The level of poverty in the region is manifested clearly in inadequate social infrastructure services. This has worsened people's access to fundamental basic social amenities such as, safe drinking water, sanitation, health, family welfare, rural electrification, rural schooling and training institutions, as well as suitable housing fit for human habitation. The supply of water and electricity is undependable. Teachers and health care providers have become demoralized to the point where some health centers and public schools have simply been abandoned. Social services in the form of education, health and recreation and physical infrastructure such as roads, electricity, water, sewers are poor everywhere (United Nations Development Programme, 2006). Stated more directly, infrastructure underdevelopment is the poverty signpost of the Nigerian ND region.

The infrastructural needs of the ND region are enormous and contentious; from rural roads, railways and harbours to irrigation systems, telecommunications, clean water, sanitation, energy and such basic social infrastructure as health, education, banking and commercial services. Given that investment capital is scarce and living standards are low, what should be the balance between consumption and investment? Should priority be given to public works or productive activities, these two sectors are referred to as SOC and DPA. This concern necessitated this write-up. The core physical infrastructure and infrastructure services addressed in this paper – namely roads, electricity, health care centres, water supply, schools and communications are foundational for Nigeria's future, not only for economic growth, but for achieving virtually all of the goals of a poverty-oriented approach to development. While infrastructure contributes to economic growth, this paper identifies greater importance of infrastructure to the input of human development. The Nigerian government-sponsored development agency established with the sole mandate of fostering rapid development in the Niger Delta region of Nigeria is called Niger Delta Development Commission (NDDC). The NDDC launched the Niger Delta Regional Development Master Plan that focuses on two goals: poverty alleviation and economic growth in the region (Niger Delta Development Commission, 2006). This paper aims to provide an investment methodology to the management of NDDC during early phase of infrastructure planning and development in the ND region, with a view of improving human capacity in the region.

RESEARCH METHODOLOGY

The paper concentrates on Ilepete community; one of the communities in the ND region. The area became the author's choice because the concentration in this community tends to give a better data and results compared to scanty data from other communities in the ND region. More importantly, because there is a government agency responsible for infrastructure development of the ND region. Moreover, the paper attempted questions that included; can consensus building contribute usefully to infrastructure planning? what priority do ND people give to SOC and DPA? can photovoice be used as a method for eliciting community people's preference as regards SOC and DPA? To examine the study questions, it was necessary to apply the concept to a real infrastructure planning process that necessitated the use of a case study approach.

A qualitative method such as semi-structured interview was used to gain in-depth understanding of the participants and therefore was considered appropriate for elicitng preference between SOC and DPA, which is necessary for effective infrastructure planning.

An adaptation of photovoice methodology was employed in this paper. It is an innovative and engaging method of primary data collection. Participants take photographs of community concerns about agreed themes. The methodology combined photography with grassroots social action. It is mostly used in the field of community development, public health, and education (Claudia, 2008). The method allows researchers and policy makers to understand fully and identify the scope of the case study not captured through quantitative measures (Claudia, 2008). The sample size was based on purposive sampling technique because the methodology required adults to handle cameras that were used for the data collection and to participate in the interview survey. The paper specified between the age bracket of twenty to sixty years for participants which was established through a pilot questionnaire survey. Based on that, fifty seven participants were first selected and subdivided into eight groups. They were asked to take photographs in the community that describe the following themes; their living standards, specifically to cover availability and accessibility to; health care services, education, transportation, electricity and water supply including housing. The photos were copied onto a compact disc for coding and analysis. All photos were given a code according to the visual themes described by the participants.The paper's methodology further adapts that of (Claudia, 2008) in that, photographs taken by the participants were used to conduct the semi structured interview in order to identify interests and opinions. The purpose of the semi structured interview was both explanatory and exploratory. The interview sought information and opinions about infrastructure development and the planning processes.

FINDINGS AND DISCUSSION

The data used was collected from both primary and secondary sources. The extensive survey of the literature pertaining to the ND region indicates the deplorable state of social infrastructure in the region.

The findings from the photovoice methodology revealed the deplorable state of infrastructure facilities and abysmal social status of the ND people; this corroborates the findings of (United Nations Development Programme, 2006) and (Paul & Shonali 2008). The findings of the photovoice interview analyses indicate that the available social infrastructures in the ND region are inadequate, unavailable and poor quality, from water to telecommunication. The participants' photos from photos 4.1 to 4.5 below indicate that housing can generally be described as being in a poor state. Health and educational facilities are in shabby conditions while electricity supply and portable water supply facilities are not available in some rural areas in the region. The photovoice interview also revealed that one primary school serves every two settlements which is about 14 square kilometres while one secondary school serves every seven settlements which is about 55 square kilometres.

Photo 4.1: A structure for habitation in the rural area of Ondo state NDR

Photo 4.2: One of the Methods of Waste Disposal in the rural area of Ondo state NDR

Photo 4.3: Some rural people queuing up for medical outreach in Rural Area of Ondo state NDR

Photo 4.4 A typical primary school classroom in in Rural Area of Ondo state NDR

Photo 4.5 Basic river transport, but may cost N1,200 (US$10) per trip from the village to the nearest town

The photos 4.1 to 4.5 reflected that the majority of communities living in isolated areas lack the most basic modern medical care. Furthermore, across the ND region, nearly all school facilities are in a state of extreme disrepair requiring major rehabilitation. The secondary school system has been seriously afflicted by shortages of quality teachers; a regional pattern that is becoming increasingly acute due in large part to discordance between investments in infrastructure outside a well – coordinated planning process; revealing the immense challenge to development and provision of social amenities for sustainable livelihoods.

CONCLUSION AND FURTHER RESEARCH

The holistic investment methodology demonstrated in this paper emphasizes the positive relationships between infrastructure and human development which are often less recognized.The importance of a consensus building approach has proven well to improve infrastructure planning especially during its developmental stage. The unbalanced growth concept analysed in this paper purposely to indicate investment priority in infrastructure planning is necessary for scarce resources to be economically as well as efficiently utilized. Also, not only to break out of underdevelopment, but more importantly to be on the path of sustained growth. SOC is being argued over direct productive activities (DPA), for the purpose of creating an appealing and a healthy society in Ilepete community; one of the communities in Nigerian ND region as the main priority and prerequisite before embarking on direct productive activities (DPA) projects in the region. The availability of SOC like water supply, primary and reproductive health and basic education facilities, electrification would stimulate both domestic and foreign investments in projects like skill acquisition centers, manufacturing industries and railway transportation among others. The provision of some SOC is indeed a pre-requisite for investment in DPA. However, the author would like to indicate that the paper did not highlight the order of priority of the identified social overhead capital projects during developmental stage; this important area needs further research.

RECOMMENDATION

By a way of recommendation, the author is of the viewpoint that the provision of these SOC should be provided by the government or public enterprises due to the fact that infrastructure is not generally suitable for private investment because of the magnitude of capital requirement, the long gestation period and the high risks involved. Furthermore, the profit-seeking objective of private enterprises may not suit the multifaceted nature of infrastructure. However, exclusion of private enterprises may not be absolutely realistic in this case study, in case of inclusion of private investment in the provision of SOC in the ND region, certain regulations should be put in place to protect the public welfare. The paper's concept is recommended for Local/Regional Governments, State Governments as well as National and International donors.

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