INTEGRATING ENVIRONMENTAL RESOURCE APPRAISAL INTO THE TEACHING OF SECONDARY SCHOOL GEOGRAPHY TO ENHANCE ENTREPRENEURIAL AND FUNCTIONAL EDUCATION

Dakur S. Dickson

Abstract

The paper discusses the application of simple pragmatic teaching approach to environmental resources appraisal as a way forward for achieving entrepreneurial and function al geography education in Nigerian secondary schools. The concept of environmental resources and resource appraisal and development within the context of geography education are discussed. Issues in environmental appraisal are also deliberated upon. Problems associated with the teaching of resources appraisal for achieving a functional geography education are highlighted and a few recommendations in the light of the discourse of the paper are made as a way forward.

Introduction

The cherished goal of vision 2020 of the present government to make Nigeria one of the top 20 most developed economies in the world by the year 2020, is not an entirely new concept and national dream. It is rather a re-statement of past national dreams and aspirations for economic, educational, political, social and cultural development in a new conceptual and temporal context. This is evident for instance, in the philosophy and the goal of the nation's education as represented in the national policy on education. The philosophy clearly specifies and prescribes entrepreneurial and functional education. Thus, it places high premium on teaching school children vocational skills and scientific thinking for the development of the spirit of enquiry and creativity. These include training in applied science, technology and commerce and sub-professional grades. This is aimed at bridging the gap between school learning and job performance. Thus, the policy outlay of education in Nigeria is very pertinent to entrepreneurial and functional education. What is baffling to most Nigerians is the continuous breach between policy and functionality of our education which has lead to high unemployment rate of the country, a worrisome situation to all including teachers themselves. Many teachers have expressed dissatisfaction over the failure of the country's education to reduce unemployment. Okeke-oti (2008) for instance observed that the current education system does not seem to prepare students adequately to harness their potentials to become self determine and self-reliant. This means that the education given to our school children lacks the impetus for propelling Nigeria to attaining the eminence necessary for achieving vision 2020.

This problem may perhaps be addressed through a renewed determination and commitment that is much more than policy refraining on the part of those in control of the polity and power of the day, and a re-orientation of the teaching and learning process by teachers. This is necessary because entrepreneurial and functional education requires that the teaching and learning process should take place both in the school and the surrounding society (Ojala, 2008) and aimed at transforming the learner into an entrepreneur with flexible, creative and problem-solving individual.

Entrepreneurs are people who have the ability to see and evaluate business opportunities, to gather necessary resources to take advantage of them and to initiate appropriate actions to ensure success (Meredith, Nelson and Nick, 1982). The hypothesis of this paper is that when secondary school students are taught simple method of environmental resource appraisal with empirical and practical orientation, they will develop entrepreneurship characteristics that would enable them take advantage of natural resources in their localities and harness them for self-determination and self-reliance that would lead to personal and social economic prosperity and attainment of vision 2020.

Concept of Environmental Resource

An interpretation of resources which remains relevant in the twenty first century since the beginning of the twentieth century is the functional definition. This definition hold that a thing is not a resource unless it possesses utility value that can be applied in the satisfaction and fulfillment of human needs. This philosophy is professed by Santa (2005) who said that all means of satisfying human needs at a given time and place are resource. He affirmed that resources are means of attaining individual and social welfare which are made up of natural components like land, water, minerals, forest, wildlife, energy and man himself. A comprehensive typology of environmental resources however should include climatic condition, ecological system and cultural heritage as suggested by Daniels and Daniels (2003).

In much the same vein Zimmermann as cited in Mitchell (1993) argued that neither the environment no part of the environment are resources until they are or are considered to be capable of stratifying human needs. Resources, he stressed, are an expression of appraisal and represent an entirely subjective concept. For instance, he explained, coal was not a resource without people whose wants and capabilities give it utility; as such it is a subjective, relative and functional concept. He later elaborated upon the functional interpretation of resources and stressed that natural resources are dynamic, becoming available to man through a combination of increased knowledge and expanding technology as well as changing individual and societal objectives. From these views it means that the attribute of nature are just but 'neutral' stuff until man is able to perceive their presence, to recognize their capacity to satisfy human wants and to invent means of utilizing them. This type of knowledge can much easily be learnt through active learning which is the thrust of this paper. Active learning in geography would lead to creative thinking within the environment and increased knowledge of and about environmental resources, thereby expanding their presence and availability and adequate utilization for personal and social gain.

Environmental Resource Appraisal and Development

Environmental resource appraisal in geographic studies is one of the four traditions of resource analysis which is concerned with surveying, mapping and measurement of the supply and demand of resources and their characteristics and properties. The basic concern is with the location, distribution, area extent and supply and demand of environmental resources (Mitchell, 1993). According to Mitchell such studies focus on inventory and ask such questions concerning the resources about where they are located, how much they are in their location; what their conditions are; how available they are; what is their demand; how will changing prices, technologies and values affect their future demand; how will different resource uses interact to influence future supplies; what opportunity exists to improve their production and so on.

Environmental resource development (Mitchell, 1993) is the translation of the 'neutral' stuff of environmental resources into usable materials and products. Typical example, he explained, is the

conversion of water bodies for domestic, industrial and agricultural use by construction of dams. This implies also sinking of wells and drilling of bore holes as well as the building of treatment plants to convert waste water to usable one. By this position environmental resource development at the lower and micro scale should involve harnessing the fauna, flora and edaphic materials of the local environment for satisfying domestic and commercial needs of the people of a given locality.

Environmental Resource Appraisal Methods Suitable for Geographic Studies in Secondary Schools.

Environmental resources appraisal often involves the use of a wide range of methods and instruments some of which are complex, difficult and hardly can be understood by secondary schools students. For instance, the use of air photos, remote sensing imagery, laboratory analysis and complex statistical techniques such as factor analysis and regression analysis in resource appraisal are substantially beyond the understanding of secondary school students. Conversely some approaches are within their understanding. These are field observation and inventory which are also used in environmental resources appraisal. The application of any methods is however a function of the nature of the environmental issue in question and purpose of the study.

Observation, according to the national academy of science (1997), is central to geography's concern for representing the complexity of the real world which is done through direct on-the-ground contact between the geographer and the subject through field observation, inventory and exploration of environmental phenomena. In this case the field is the principal laboratory for geographic investigation. In the same vein the national geographical research and exploration (1994) asserts that students acquire geographic information about the location, physical and human activities and conditions of people who live in a place through field observation. These positions strongly suggest the imperativeness of field observation in geographic studies.

An inventory as defined by Wesbter Comprehension Dictionary is the listing of articles, supplies or materials, with description of the quantity and value of each. In this connection, environmental resource inventory is the identification, classification, quantification and evaluation of the natural resources of the environment.

Issues in Environmental Resource Appraisal

Three basic is issues as represented by Mitchell (1993) are embodied in environmental resource appraisal. These include land use, land capability and estimating demand. These are broad in both content and methodology that space and time constrains can not permit their exhaustive discussion in this paper. Hence, only two of them are discussed subsequently.

Land Use Studies

From the cultural or human geographers' point of view land use is conceptualized as the type of activities occurring in a given piece of land. From this position, Daniel and Daniel (2003) classified land use elements to include residential, commercial, industrial, institutional, public, agricultural, conservation, forestry and mineral extraction. Physical geographers however consider natural ecological units as part of the classification of land use. From this view point, land use (Mitchell, 1993) include forest and woodland, meadowland and permanent grass, arable land or till land, heathland, moreland and rough hill pasture, garden allotment, orchard, nurseries and derelict land. Land use survey and classification has along standing history (Mitchell, 1993) which was started by a British geographer, Dudlley stamp in the 1930s who devised a land use classification system for

Britain which later served as deriving force for developing a system to be used for the world land use system. As in all resource surveys, his initial task was to develop an exhaustive and mutually exclusive classification. He adopted physical field work in which he used university students and teachers, school teachers and their students. The second land survey (Mitchell, 1993) was done in 1960 under the direction of Alice Coleman, another geographer. As with the first survey, field observation was completed by volunteers from schools, local geographical societies, training colleges, university department, rural study groups, country branches of national farmers union and other such groups. At the end of each of the surveys, land use map was published on the scale of 1:63,360 and 1:25,000 respectively. At the global level (Mitchell, 1993) a commission on world land use was established in 1956 with the primary goal of stimulating comparable land use surveys through out the world. Its activities covered different countries of the world such as Cyperus, Sudan, Iraque, Greece, Canada etc. The world land use survey had its root in the 1930 from stamp's initiative with specific application of remote sensing and geographic information system in resource inventory. With increased technology, today satellites are used to collect imageries for resources inventories in different parts of the world including Nigeria.

Land Capability Study

Land capability as defined by Signh and Dhillon (2004) is the physical characteristics of land, its inherent soil qualities and farm management practices. Land capability survey therefore involves collecting data about these variables of the land with the purpose of producing land capability map as a planning document for developing the land. Development in this context as earlier stated is the transformation of conversion of natural resources into usable product for domestic and commercial gain. This requires planning, the initial stage of which is Marshalling of information and making analysis of it for appropriate decision and action. It is very essential (Signh and Dhillon, 2004) to make an inventory of the soil to ascertain for instance, which uncultivated soil can be brought into production and which cultivated soil can be made to produce more than they do at the present. Since some land, they contended, are more fertile than others and population is increasing in inverse proportion to the available arable land, it is imperative that land capability is surveyed and assessed. A full inventory of land potentially and suitability according to them can be prepared only with a detailed soil survey and that the classification of such potentiality and suitability provides easy comparism among the different soils that occur in given region.

Similarly, Daniel and Daniel (2003) asserted that a key product of natural resource inventory is land and water suitability analysis which identifies those areas of the community that are appropriate for development, places that have moderate limitation for development of various types and areas that should be protected in their natural state because of severe environmental constrains. More so, it should also include identifying lands with particular capabilities such as wetland and aquifer research areas as well as providing information on the carrying capacity of the community (that is how many people development the community can sustainably support before serious negative impact on the natural environment occurs).

Teaching Environment Resource Appraisal

Direct field study as earlier suggested is well-suited for environmental resource appraisal at the secondary school level. Field work is an established and proven tradition in geography. This is evident in its being deeply ingrained in the curriculum of the subject at all levels of learning. It entails direct observation and filed research involving learning and empirical process of collecting primary

data directly from the field. This relevance has been stressed by Signh and Dhillon (2005) who affirmed that geograhpy's major break-through has been through field studies in which geographers go directly to the source of all geographical knowledge and come face to face with raw and undisturbed phenomena with which they have to deal. Field work, according them calls for close examination and analysis of the environment of the accessible piece of a country, showing one or more aspects or regional differences. All these revelations points to the value of field work in geographical studies which no serious minded teacher will take for granted. This paper therefore attempts a presentation of framework for field approach to the teaching of environmental resource appraisal as seen below to serve as a guide to the reader.

Field Study on Land Capability

Preparation for the study should start with the procurement of all necessary tools consisting of the following:

1. A base map of the study area;
2. Graduated cylindrical tin for measuring infiltration rate of the soil;
3. Spade, shovel and hand trower for dissecting the soil to study its horizon structure, colour and other visible features;
4. Ranging poles, abney level, altometer or field sketching aneroid, prismatic compass equipment for measuring topographic parameters;
5. Soil testing kit containing distilled water, 10% hydrochloric acid, 30% hydrogen peroxide, BDH universal soil indicator colour chart;
6. Munsel soil book;
7. Test tube and self-sealing plastic bags;
8. Tape, graduated measuring rod, ruler;
9. Auger, sampling augur and pucket pit and moisture meter and
10. Penetrometer.

The next stage of the preparation should be thorough teaching and demonstration on how to conduct the various tests, measurement and recording of information using the proforma designed by the teacher.

The third stage in this process is the division of students into two or more groups for the actual field work. This is necessary for efficiency and proper coverage of the parcel of land to be studied. This should also include thorough explanation of the base map to all the groups, clarifying the working portion of each.

Site Activities

Various activities as suggested by Onazi and Alaintan (1984) include close observation, description, measurement, recording, drawing, differentiation, classification and analysis of various data. The individual groups are either assigned to work on different sectors of the land or selected variables. If they work sectorally each group has a small area to cover but large variables to deal with. On the other hand if the groups are assigned specific variables, they have large area to cover but few variables to deal with. The variables to study in terms of land capability consist of such characteristics as surface, climate, land use and physical properties of the land. These have sub-characteristic as seen below which students should study and classify

Surface Characteristics

i. Degree of slope
ii. Slope Aspect
iii. Erosional Harzard
iv. Drainage
v. High above datum

Climate Characteristics

i. Rainfall
ii. Temperature
iii. Duration of sunshine and sun light
iv. Prevailing wind direction

Land Use

i. Land use type
ii. Suitability for different use
iii. Soil characteristics of different land use type
iv. Micro relief of different land use type
v. Cropping pattern, intensity and soil type of different properties land use

Physical Properties

i. Depth and Profile
ii. Texture
iii. Structure
iv. Stoniness
v. Drainage
vi. Chemical
vii. Alkalinity
viii. Salinity
ix. Acidity
x. Water logging and flooding

The data obtained from these studies should be carefully built into the base map by the teacher with the help of a professional cartographer to be kept in the school as reference material.

Problem Associated with Teaching Environment Resource Appraisal

The problem of teaching resource appraisal like other practical aspect of geography emanates from the students, teachers, school authorities and the study area. Experience has shown that majority of geography teachers at the secondary school level lack the knowledge and efficiency with which to use most of the simple scientific instruments for field studies. This is evident in the gross absence of these instruments in most secondary schools. The author surveyed the opinion of school principals in the Shendam LGA during his teaching practice supervision in July , 2009 and found that geography teachers don't make request even for the affordable instrument, an indication of their lack of knowledge of them. Students on their part make such studies difficulty (Damar, 2007) as controlling them in the field during field studies is very tasking. Most schools as reported by Joel (2004) suffered gross inadequacy of instructional materials for the teaching of map reading talk more of the more costly field study equipment. In addition, most school authorities give little or no consideration to geography field studies on the time-table. Where the place of study is a difficult, hard-to-go landscape, the enthusiasm of both the students and teachers are hardly sustained as they can easily get exhausted and loose interest in the whole exercise.

Conclusion

The need to integrate environmental resource appraisals into teaching of school geography is very pertinent to educating school children on the rich content of our environmental. Such knowledge will no doubt stimulate their creativity for exploitation and development of environmental resources, there by becoming self-determined and self-reliant individuals in life. The integration will in my

conviction, empower the subject into an entrepreneurial and functional one, well positioned to contribute its quota to the attainment of the national objective of vision 2020.

Recommendations

The recommendation of the paper based on its discourse include the following:

1. School authorities should organize workshop for geography teachers on the use of simple scientific instruments for teaching geography especially the ones for conducting field studies.
2. More time should be allocated for teaching geography to enable teachers conduct practical field lessons.
3. Government should make sufficient fund available to schools to procure teaching aids as no teacher can operate effectively without aids.
4. School heads should maintain close supervision of the teachers to check against gross negligence of filed studies in geography.

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