

MAP DESIGN AND PRODUCTION FOR RESEARCH PURPOSES IN THE NIGERIAN UNIVERSITY SYSTEM

REV. M. MARKSON OBOT

ABSTRACT

Research maps shown in Journal articles and Books in the Nigerian University System over the years has been found to be less educative, confusing and misleading due to their methodology of being poorly designed and produced. Highlights shall focus on a professional map making techniques that will be useful for research purposes in the Nigerian University System using data from the Topographic map series of Opobo, Sheet 335, Nigeria on a scale 1:100,000 and Dye line print of Ikot Abasi Local Government Area with a scale 1:75,000 for boundary outline.

Random Sampling techniques and simple percentages calculations were used practically to test the claim of this submission. Organized presentation shall reflect the concept of Map Design and Production, Working Scheme, map layout, flow diagram, text and symbol specification and name placement, finally recommendations and conclusion

INTRODUCTION

Notably over the years many research maps for research purposes published in journals and books in the Nigerian university system has been view with dismay for their being poorly designed and produced. The reason being that the authors fail to take cognizance and implications attached to misleading maps in their articles for further scholarly work. They forgot that, maps for research and other purposes should be made by the professional Cartographers for sustained durability, clarity and legibility after any scale reduction or enlargement. Moreso peer reviewers and editors ignore these errors thereby rendering maps in publications less educative from its original purposes.

Objective of this study shall examine the areas of poor map design and production, which includes details around the map framework and mapped face, that should lend themselves well to photographic and printing process without loss of legibility. Others include difficulties in interpretation of such maps and as a result hampers social education of an environment or neighborhood location. Empirical computations shall be based on a five-year span period through random sampling on maps published within the academia of the Nigerian University System

The Concept of Design and Production

Design:

In Cartography design refers to the planning of a map and especially too the choice and arrangement of its graphic elements. (Robinson and Sale 1969) Furthermore it means laying out plans of details which would appear on the mapped face systematically prior to production or construction. It is also, a vital part of the cartographic process in that, the various marks, lines, tone colours, patterns, symbols, and lettering etc. be carefully chosen and fitted together.

Production:

Whereas production embodies the skillful methodology of creating and producing the geographical data on a map as a whole so that every detail or item included is clear, legible and appears as an integrated unit and neither more or less prominent than it should be, (Keates 1973 & Obot 1991). This further proves that symbols, lines, lettering etc must be produced using different point size to suit a particular map at hand.

Working Scheme

Working Scheme is an act of breaking down or collating of details on a map into phases of production, a simple probability in handling map making (May 1990). In the Scheme, features are grouped in colours and the constructional method attached to them. This is also a constant reference table, see table, for changing from one practical stage to another be it colour, map element and method of production. It produces a careful study of information on the base map which would fetch a standard end product – map, of international recognition and usage at its publication. For this paper the scheme provided for a three colour map work, thirteen map elements and using two production methods. Firstly ink with pens of different points and two computer-assisted cartography. See flow diagram figure 1.

Colour	Map Element	Production Method
Black	Roads – major, secondary, paths, framework, scale lines and tracks and boundaries, town symbols, text.	Ink with different points of pens and Computer-Assisted Cartography
Cyan or blue	Coast lines, rivers, open water, marsh	
Magenta or (Red)	Major Road	

Table 1: Working Scheme

Flow Diagram

Flow diagram depicts a shorthand way of describing the map production process where boxes are used to represent sheets of materials and lines to show processes of or other connections, (Brown et al 1986). Notes are shown in each box indicating what takes place therein. Other information in the flow diagram include trimmed size, material size and how images are combined and produced to the final stage. Through a flow diagram estimation and cost of any map project can be done easily. This flow diagram in figure 1 below shows the production stages used for the design and production of the research map in figure 2.

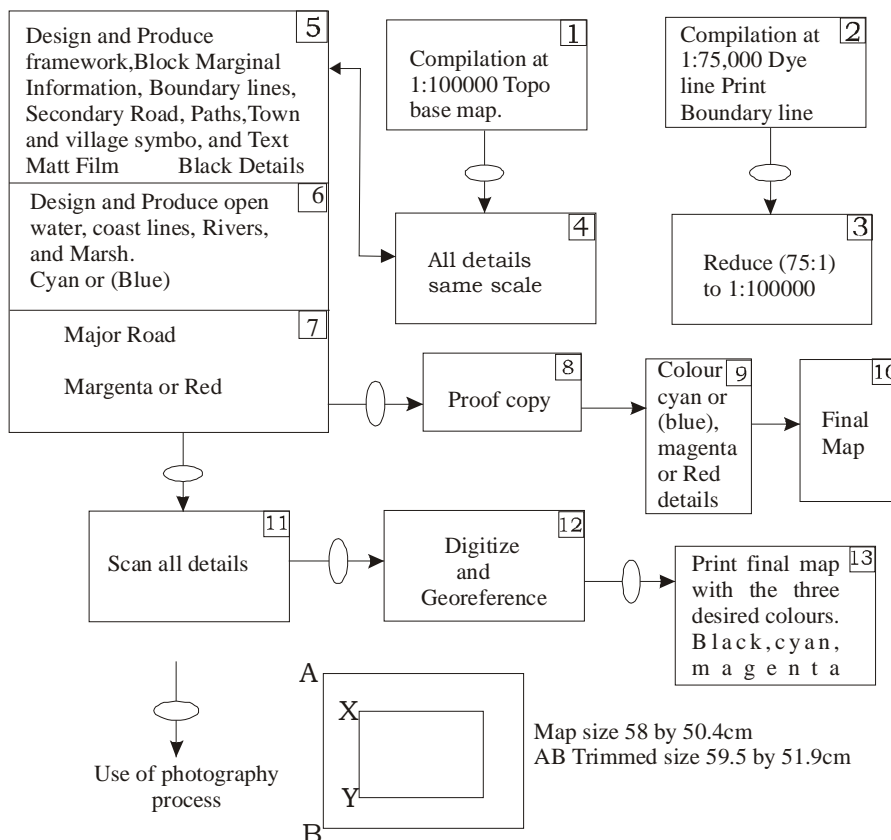


Figure 1. Flow Diagram

Map Layout

Map layout portrays one of the most subjective aspects in the field of map making. It embodies the framework of any map taking into consideration the size, shape and scale of the area to be mapped, the amount and kind of marginal information e.g. title, scale, legend, etc. A map layout provides a base for marginal information around it for any map user to identify the type of map at hand for easy interpretation.

Furthermore, map layout helps the publisher, cartographer to know the dimension of materials to be used from the start of production to an end and also the trim size of the final map sheet. See figure 1 where the map size stands at 58cm high and 50.4cm wide with trim size 59.5cm by 51.9cm

Text Specification

It is only a rare map that does not have on it some sorts of lettering (Keates 1973). Usually maps contain variety of names of places, regions and other geographical entities, together with numbers titles, explanations, acknowledgements etc. Therefore, text specifications in map lettering (Bartz 1966) deals with the characteristics of letters in respect of text type for form, size for height and width for bold, medium and light.

Text specification used in figure 2 were carefully selected in conjunction with text properties found on the base map. Text with special commands like upright or italic letters were used for cultural features and natural features respectively. Italic or slant for rivers e.g. Imo River and upright took to cultural or man made features e.g. ALSCON. Other special command for text include capitals for map titles, capital cities as found in figure 2 while upper and lower case for lettering of villages and other details.

Symbol Specification







This refers to dimensional characteristics of cartographic symbol which may be classified into point line and area symbol in relation to the map scale. Symbols can be pictorial, geometrical and letter or number symbols.

Specification and designing of symbols are interwoven. The former makes it possible to specify types of symbol that should be used in a particular map in line with its scale, while the later designs and studies different symbols for each object that appears on the map face harmoniously, (Bos 1984). While letter symbols were used to describe locations of major industrial set up e.g. Nigerian Gas Company.

Point symbols in geometrical form were used to show locations of settlement, e.g. IKOT ABASI. Line symbols went in for graphic scale, roads, boundaries, which were designed and produced to achieve various line thickness (Good Child 1988).

Name Placement of Compulsory and Optional Marginal Information Around Map Framework

Name Placement:

It is the identification of point features, linear features and area features on a map in a written language (Hodgkis 1970). Compulsory items are information regarded as essential and must be included such as title, area of coverage, legend, conventional signs, geographical co-ordinates etc. While optional items are desired information that should be included if space permits such as representation of relief diagram, complication diagram etc. Figure 2 had all the compulsory items as mentioned above while names are placed at the most graphical space on a map in six different orientations. Centrally above the point , centrally below the point,  slightly to the right above the point  and slightly to the right below the point , slightly to the left above the point  and slightly to the left below the point 

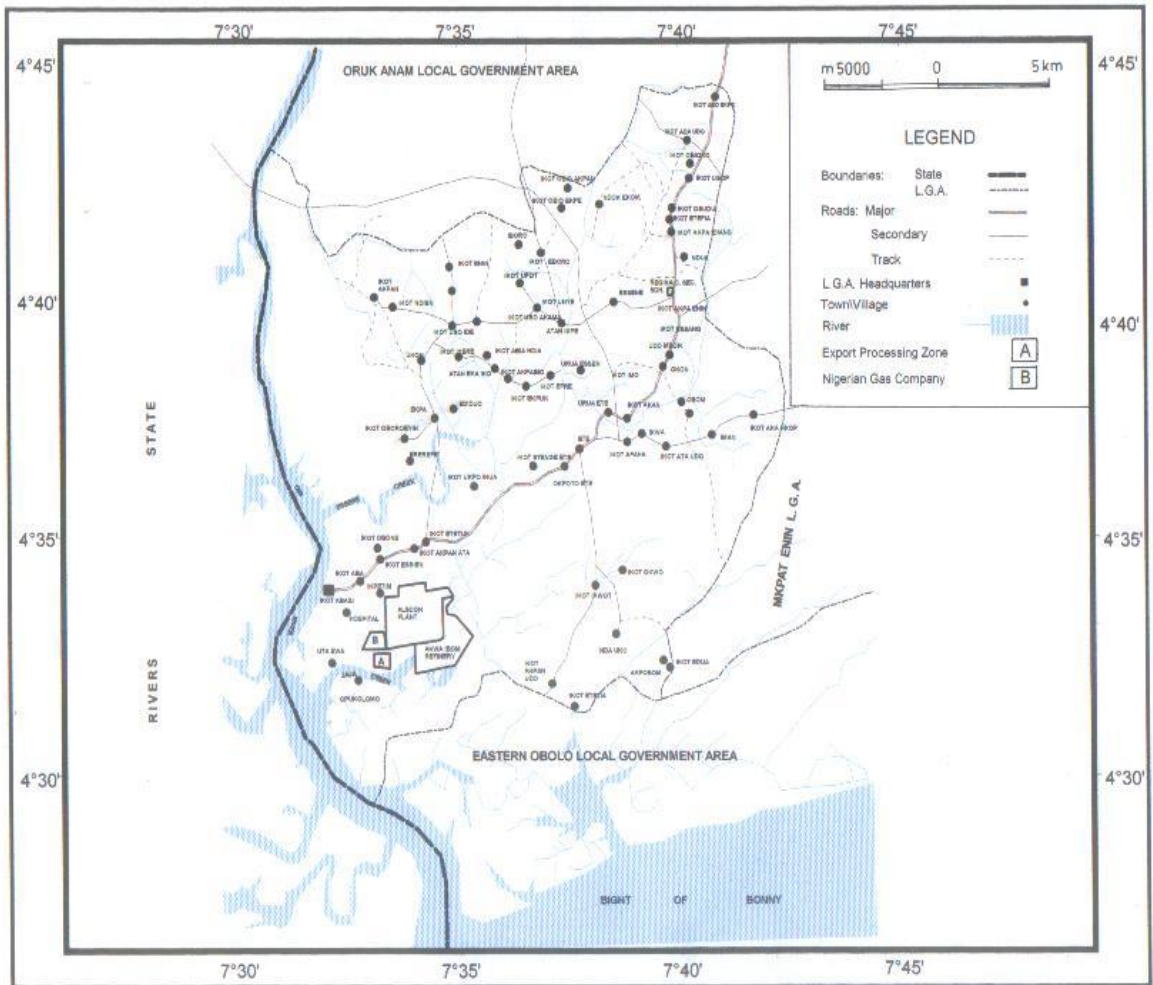


Figure 2 Ikot Abasi Local Government Area

Methodology of Study

Involved sampling of data collection and the techniques of data analysis. Random Sampling method of data collection was applied in this study, and its application affected a five year period for years 1998, 2001, 2002, 2003 and 2004. Simple percentage computations became the technique for analyzing the data.

Materials were collected from journals and Books published within the Nigerian University System whose articles are associated with illustrative maps and diagrams to strengthen their publications viz. The Nigerian Geographical Association and The Nigerian Cartographic Association. Table 2 below shows a true perspective on how the research items were derived and computed into percentages.

S/No	Name of Journal And Book	Year of Publication	No. of Figures	No. of Poorly Designed and Produced Figure	Percentage %
1.	Geography and the Nigerian Environment	1998	41	25	61%
2.	Cartography And GIS in Nation Building	2001	24	15	63%
3.	Maps And Resource Management	2002	31	20	65%
4.	Cartography, GIS and Sustainable Environmental Management	2003	24	13	54%
5.	Cartography, GIS And Agricultural Development	2004	33	20	61%

Table 2. Poorly Designed/Produced Maps in Published Articles.

Discussion on Poorly Designed And Produced Maps

Among the maps sampled, it was noted that out of 41 figures, 25 figures were poorly designed and produced which were published in the book: Geography and the Nigerian Environment, a publication of The Nigerian Geographical Association in 1998 which scored 61% deficiency, see table 2 above. Figure 3a (Dogo 1998) with its true size and shape had no geographical co-ordinates, scale not properly calibrated, no legend, part of the map started with the neat line.

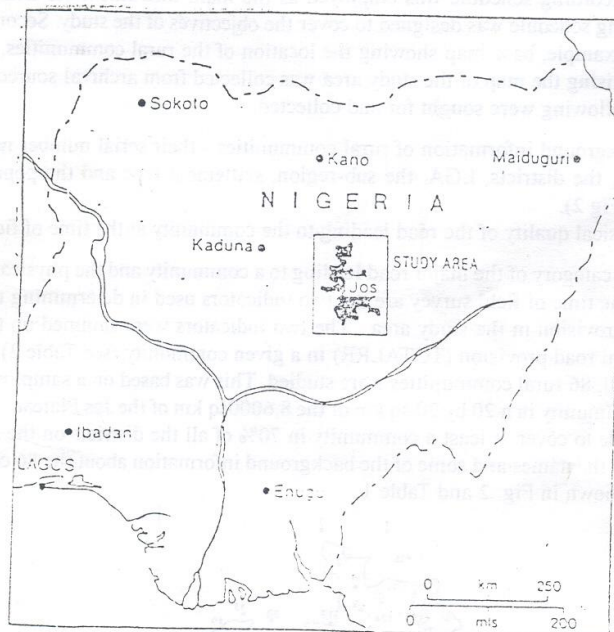


Figure 3a: (Figure 1) The Location of the Study Area

In the year 2001, 63% was recorded to maps poorly designed and produced in a book titled: Cartography and GIS in Nation Building published by the Nigerian Cartographic Association. The 63% computation showed that out of 24 figures published in the article, 15 of them were underscored, see table 2 above. Figure 3b (Sambo and Audu 2001), had no geographical co-ordinates, no known town location even though that is mentioned in the title of the figure, the scale shows no kilometer calibration, circular points on the figure not shown on the legend, improper position of the scale block.

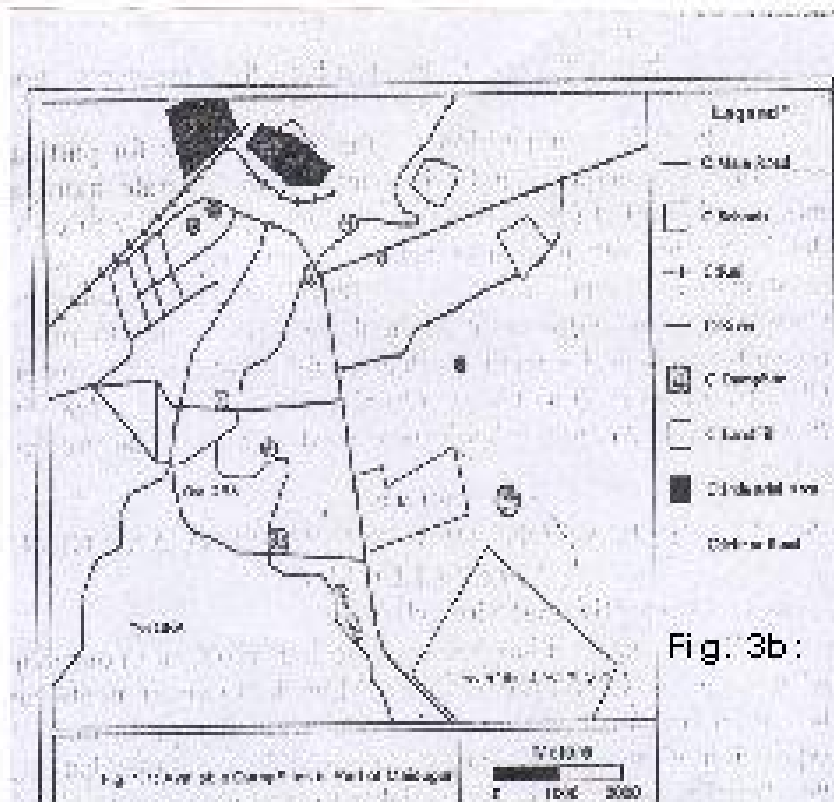


Figure 3b: Available Dump Sites in Part of Maiduguri

Maps published in 2002 from a book of The Nigerian Cartographic Association themed Maps and Resource Management had 31 figures whereas 20 of them lacked Cartographic professional touch with the highest percentage score of 65%, see table 2 above. Figure 3c (Soneye 2002) below in its actual size and outlook at publication had the following poorly designed and produced characteristics viz the scale is blind, text and legend not legible, no geographical co-ordinates, the editors unawareness not to reduce the map beyond legibility outlook at publication, no neighbouring Local Government Area to Ikeja in the title is shown on the map for a link up identification.

In the year 2004 a book of the Nigerian Association was published entitled Cartography, GIS and Agricultural Development. The Book contained 33 figures with 20 of them at 61% not skillfully designed and produced, figure 3e (Dada 2004) was randomly sampled as one of the materials for discussion. This figure showed a blurred text, lettering not legible and conventional e.g. Bight of Benin written with condensed lettering, despite enough graphical space, and using a straight line to show the position of legend.

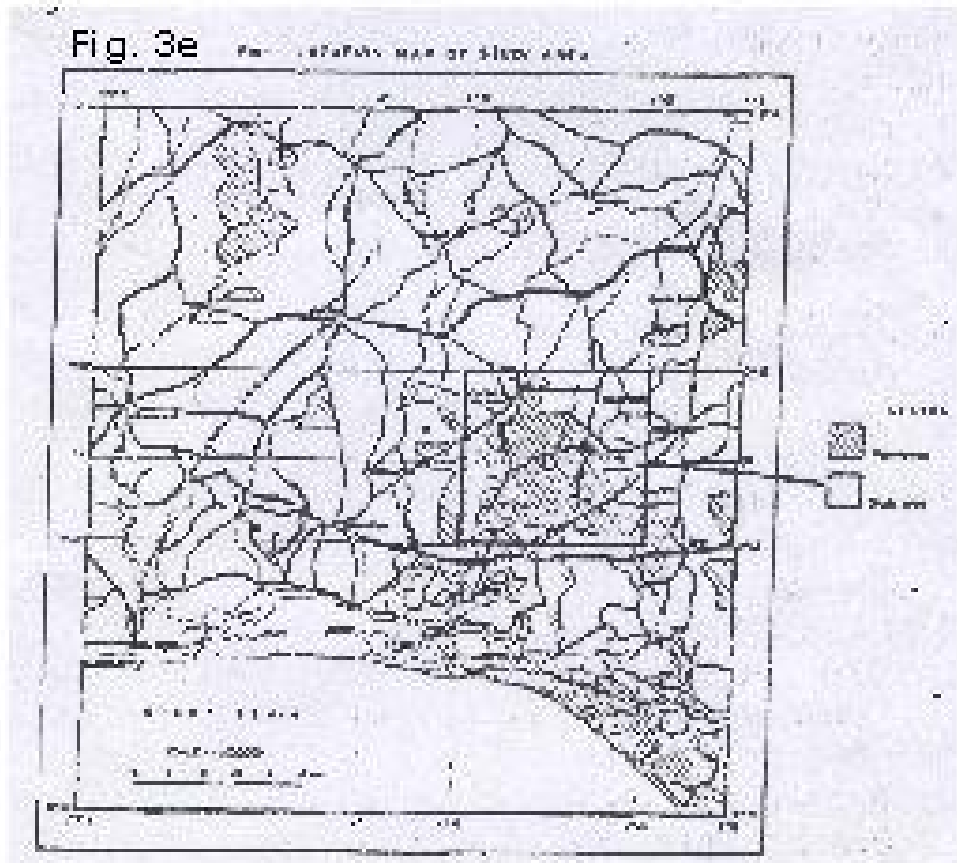


Figure 3e: Location Map of Study Area

Recommendations

Article Maps should be produced by professional Cartographers, whether computer – assisted or analogue to achieve the desired conventional expertise for easy map interpretation and usage.

Peer reviewers should always refer all diagrams and figures for publication to the professionals for scrutiny.

Editors should note the scale of reduction to figures so that they don't loss legibility during photographic processing and this should carry instructions early enough during a call notice for manuscript.

Conclusion

Figure 2, the map for this research was designed and produced using the steps in this paper from where a poster has been prepared to incorporate figures 2, 3a, 3b, 3c, 3d and 3e for poster presentation.

It should be noted that figures 3a to 3e are all poorly designed and produced maps which by one way or the other are less educative, misleading and confusing in the academia.

Figures 1, 2 and 2a show clear representations of research maps designed and produced in a professional background.

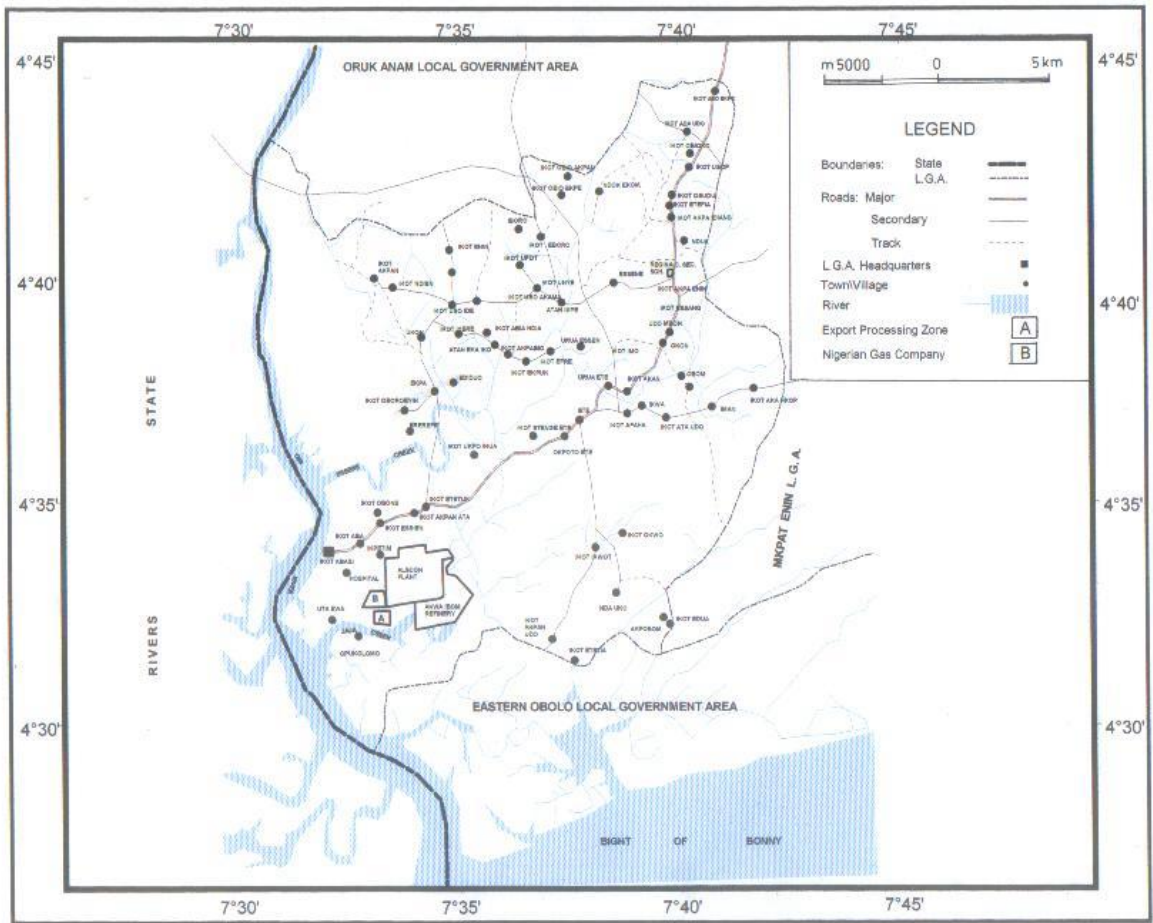


Figure 2a : Ikot Abasi Local Government Area

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Biographical Details

Rev. M. Markson Obot, O.N.D., DIP Cato, B.Sc. MNCA, MNGA, The Chief Cartographer / Geographer for the University of Uyo, Nigeria. Past Sabbatical Appointee of Cartography for Abia State University, Nigeria. Over 20 years of teaching of professional Cartography. Past National Executive council member of The Nigerian Cartographic Association. Past NCA Conference Organisation Secretary for Akwa Ibom State Chapter of Nigeria Cartographic Association. Presently the Editor for Akwa Ibom State Atlas project. Rev. Obot is an Anointed Ordained Minister of God.