Alternative Cartographies: A Taxonomy of Indigenous Systems of Cartographic Communication in Africa

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Africa has a rich, complex and homegrown cartographic knowledge system by which the people effectively disseminate geographical information. Ironically, however, the traditional media and channels of cartographic communication in Africa have been largely neglected or marginalized. Thus far, only little research has been done to take stock of the modes, forms and channels of Afro-centric indigenous cartographic communication systems. Yet, the overall socio-economic development process of aboriginal African societies is intertwined with their indigenous knowledge systems, including their cartographic communication systems. It is this body of indigenous or alternative cartographies that this paper is primarily concerned with. In other words, the paper exegetically looks at the 'non-western' cartographic cultures in traditional African societies. In particular, the paper explores the nature, content, and role of established indigenous cartographic communication systems in pre-colonial Africa. Hence, the various local media and channels of generating, storing, disseminating and utilizing geographical information are identified and discussed. Moreover, the paper attempts a classification of the different traditional forms of cartographic communication in Africa.

Keywords: Alternative cartographies, classification, indigenous communication systems, indigenous cartographic communication, Africa

1. Introduction

It is often overseen that indigenous cartography in Africa predates modern map making. The genesis of map making and map use in Africa could rightly be traced to the very beginning of human existence in the continent. Africans have always communicated cartographically in various ways. There are several alternative cartographies that one could possibly find amongst the various peoples and cultures of Africa.

Indigenous cartographic media, as a component of indigenous communication, deserves every attention in view of its enormous value as a potent tool for driving development initiatives especially in the rural areas (cp. Mundy & Compton, 1991; Uluocha, 2003; Corbett & Keller, 2006; Burini, 2012). However, the various indigenous modes and channels of cartographic communication in Africa have not been fully identified, recognized, accepted and classified as yet. But there is need for all that to be done. Perhaps, unbeknown to many, and contrary to the view of some antagonists of indigenous knowledge and communication, Africa is rich in indigenous cartographic culture. It would take a well-orchestrated, deliberate, articulate and painstaking taxonomical effort to unveil the wide spectrum of indigenous media of cartographic communication in Africa. The absence of a standard classificatory structure of the indigenous cartographic media in Africa can heavily affect further studies on indigenous cartography as a genre of the field of cartography.

Several scholars have at different times identified and/or attempted a classification of the forms, processes and channels of African traditional communication. (cf. Doob, 1966; Akpan, 1977; Ugboajah, 1979; Wilson, 1987 & 1998; Mundy & Compton, 1991; Mundy & Lloyd-Laney, 1992; Ibagere, 1994; Ansu-Kyeremeh, 1998; Akpabio, 2003; Ogwezzy, 2008; Makyotto, 2014). Nevertheless, not much formal attempt has thus far been made to specifically identify and classify the myriad of indigenous African cartographic communication systems. Indigenous cartographic communication is an integral part of the overall indigenous communication systems. Hence, indigenous cartographic communication cannot be totally divorced from, or treated purely in isolation of indigenous communication as a whole. It is possible, however, to recognize the cartographic content of indigenous communication.

Issues such as how indigenous information or knowledge is communicated, how people learn and acquire indigenous knowledge, the people and institutions involved, and how communication is organized in local communities are all important and worthy of intellectual interrogation. However, for now, our focus is basically on how indigenous cartographic communication takes place. In other words, this paper is primarily concerned with the identification and classification of indigenous cartographic communication media and channels of the African people. In this work, the term 'indigenous cartographic media' refers to those media and channels of communicating cartographic, landscape and geographical information that had been in use before and after the introduction of modern maps and mapping techniques in Africa. In other words, by indigenous African cartographic communication systems we mean what was there pre-colonially and is still being used today. The major aim of this paper is to identify and classify the various indigenous forms and channels of cartographic communication in Africa.

2. African indigenous cartographic communication systems

> "People have been creating maps to understand their surroundings since before the invention of writing" (Moore & Garzón, 2010).

> "Indigenous cartographies are as diverse as indigenous cultures… Indigenous mapping may be gestural, chanted, or inscribed in stone, wood, wall, tattoo, leaf, or paper. Indigenous maps may be used to assess taxes, guide a pilgrim, connect the realms of the sacred and profane, or navigate beyond the horizon. Clearly, indigenous cartographies are process oriented as opposed to product dependent" (Pearce & Louis, 2008).

The above brief quotes clearly set the tone for our discussion on indigenous cartographic communication systems in Africa. Cartography is a most effective means of communication across the globe. But there are different types of cartography. Africans have and practice mostly indigenous cartographic systems, or what may be rightly tagged "alternative cartographies". Indigenous cartographic communication is deeply entrenched in the culture of the people. In the African context, the term "indigenous cartography" or "alternative cartographies" refers to nonwestern cartographic traditions. It refers to antique cartographic practices of African people living within or outside the African continent. In all cultures, indigenous knowledge systems (IKS) exist, and they are laced with cartographic perceptions, precepts, practices and products.

Rural people in Africa, and indeed elsewhere, share a very strong traditional affinity with their natural environment and resources (Uluocha, 2003, Corbett & Keller, 2006); thus they have a well-developed acute geographic sense of their physical milieu. Capturing this

geographic sense in various indigenous map forms is a most practical way of giving expression to the people's cultural, economic, social and environmental values (Uluocha, 2003). A range of methods and channels are used by folks-people to represent their cognitive geospatial knowledge and information about their environment and landscape in the forms of mental, ethereal, ephemeral, or physical permanent maps. In recent times, indigenous cartography has been receiving a boost across the globe through various participatory research mapping (PRM) projects involving local people and their traditional knowledge systems. (cf. Herlihy, 2003; Uluocha, 2003; Rambaldi, 2005; Corbett & Keller, 2006; Moore & Garzón, 2010; Burini, 2012; Huertas & García, 2012, 2017; Huertas, 2015).

Indigenous cartography parades some unique characteristics. The local people are both the originators and users of indigenous cartographic communication systems. It is multimodal and multisensory in nature. The geographic or cartographic message can be encoded in various forms and conveyed through various channels. Indigenous maps could be formal or informal, verbal or non-verbal, intentional or unintentional, oral or written, structured or unstructured, permanent or temporal, concrete or abstract. They can also be about mundane or extramundane issues. Similarly, they can be concerned with terrestrial or extraterrestrial matters. Within the context of indigenous communication systems, maps are not always drawn; nor are they always presented on a flat medium. Cartographic information can be transmitted through various media and also received via several sensory organs. As a matter of fact, some map forms—such as the extramundane maps—are spiritually discerned. Indigenous geospatial map information could be relayed through oral, literary, gesticulatory, graphical, and demonstrative means. Similarly, the signal or message being transmitted can be received through various means. Traditional cartographic communication in Africa is truly and essentially multimedia and multisensory in nature. African communication modes, generally, are determined by the biological senses of man (Ibagere, 1994:83).

Similar to other traditional channels of communication, indigenous cartographic channels or maps serve a myriad of purposes. They can be used to communicate, inform, teach, promote, mobilize, entertain, advise, warn, encourage, direct, and galvanize people on what, how, when and where to act. They also serve as useful "interactive vehicles for spatial learning, discussion, information exchange, analysis, decision making and advocacy" (Wikipedia, URL).

3. Need to classify indigenous cartographic systems

Basically, classification refers to the conscious allocation or organization of items into groups or categories according to type. It normally entails the identification, naming, and grouping of related items into a formal system based on certain important common characteristics, which make the members of each group similar to one another and different from members of other groups. "Clearly, classificatory systems are an integral part of culture, whether we are talking of indigenous or scientific taxonomies" (Chambers & Gillespie, 2000).

Classifying indigenous cartographic systems is very apt. Although several efforts have been made to classify African indigenous communication media in general, not much corresponding effort has been made in classifying indigenous cartographic communication channels in particular. But such a classificatory scheme is potentially useful and, hence, desirable for a number of reasons. First, classifying indigenous cartographic communication channels will greatly help in fostering a deeper understanding and appreciation of the core

nature, types, mode, essence and value of indigenous cartography. Second, it will help in according indigenous cartography the international recognition and respect it rightly deserves. Third, it will help in legitimizing, promoting and popularizing indigenous cartography as a proper and acceptable means of communication. Fourth, such a classificatory effort will go a long way in stimulating greater interest in scholarly and scientific discourse and research into alternative cartographies. Fifth, it will serve as a veritable vehicle for documenting, preserving and conveying information about indigenous cartography. Sixth, classifying the indigenous cartographic communication media will engender in-depth and thematic analysis of the various media.

4. Taxonomy of African indigenous cartographic communication systems

In general, classifying African indigenous communication media could prove to be quite problematic. No matter how rigorous and thorough such an exercise might be, there will still be the possibility of omissions, gaps, overlaps, and misplacements. The reason for this, however, is not farfetched. There are several means of communication in Africa; this, coupled with the immense cultural heterogeneity that naturally exists in the continent makes communication more complex than is commonly assumed. African traditional means of communication are quite numerous, just as they are interrelated and interactive; none of them exists in isolation of others. In traditional African communication, a message is usually encoded, and "the receiver must decode the incoming information against the backdrop of their culture and match it with existing knowledge. Always culture and existing knowledge have impact on encoding, decoding and matching processes, which sometimes produce noise in the communication channel and results – with a very few exceptions – in no two people having exactly the same knowledge about anything. This explains why there are problems in defining and classifying African communication systems" (Makyotto, URL). The classification task becomes even more intricate and herculean when it concerns cartographic channels. This is because there are no African indigenous communication systems that are distinctively and exclusively 'cartographic'. Indigenous cartographic channels of communication are part and parcel of the overall system of indigenous communication.

Given that the traditional communication processes and elements in Africa vary markedly from one society to another (Akpabio, 2003:9), a spick-and-span classification of the indigenous modes and channels of communication is rather a tall order. In such a convoluted exercise, there is the possibility of marginalization of modes and channels; however, this might not be deliberate, but a function of the knowledge and skill of the person classifying them (Ogwezzy, 2008). The intricate, multifaceted and, sometimes arcane, nature of indigenous communication in a multiethnic and multi-cultural Africa makes it an enormous task developing a classification scheme that is robust, thoroughly exclusive, exhaustive, all-encompassing, universal, and as close to reality as possible. Thus, the classificatory structure presented here could still be subjected to some form of further refinement.

Various forms of cartography have been recognized. Woodward and Lewis (1998) and Uluocha (2010) have made some attempts at classifying cartography, especially from the indigenous perspective. Based on their conviction that a map is simultaneously a cognitive system, a material culture, and a social construction, Woodward and Lewis (1998) recognize three broad categories of cartography, namely (1) cognitive or mental cartography, (2) performance or ritual cartography, and (3) material or artifactual cartography. Bassett (1998) affirms that indigenous cartography in Africa involves all three categories identified by

Woodward and Lewis; they have been employed by the various peoples of Africa to map, name, and claim their landscapes. Similarly, while examining the indigenous cartographic heritage of Nigeria, Uluocha (2010) identifies three broad categories of indigenous cartography as practiced by the ancient people. These are oral cartography, performance cartography, and diagrammatic cartography.

But the threefold classification of indigenous cartographic communication media as proposed by Woodward & Lewis (1998) or Uluocha (2010), is considered to be rather too broad and highly generalized. Such a low resolution classification is not quite adequate and accommodating of the myriad of indigenous cartographic communication channels; it has the tendency of omitting or significantly marginalizing some types. There are different genres of indigenous mapping or alternative cartographies in Africa. In other words, African indigenous cartographic communication can be achieved through many different forms and channels. Hence, there is a felt need to further breakdown and expand the existing classificatory scheme of indigenous cartography especially with respect to Africa.

Indigenous African cartographic communication media can be classified based on origin, mode, channel, function, information content or subject matter, and users. Against the backdrop of the foregoing, therefore, it is hereby proposed that African indigenous cartographic communication forms and channels should be classified into fourteen groups, as presented below. The classification done here is primarily on the basis of how indigenous cartographic, geographic, historic, cultural, landscape, cosmographic, metaphysical and extramundane information are communicated via some sort of mapping. In other words, the classification of African indigenous cartographic communication systems presented here is based on a combination of media (channel modes) and information content. Admittedly, and as earlier noted, the groupings done here may neither be entirely exclusive nor exhaustive. Some overlaps and omissions are still possible. Moreover, each of the traditional cartographic communication channels may be used solely or in combination with some others, to effectively transmit the intended message to an audience.

African indigenous cartographic communication channels can be grouped into:

i. Oramedia channels
ii. Visual channels
iii. Geo-onomastic channels
iv. Demonstrative/Performative channels
v. Body art channels
vi. Instrumental channels
vii. Iconographic/ Symbolographic channels
viii. Ideographic channels
ix. Mensurational channels
x. Tactile channels
xi. Mnemonic channels
xii. Cosmographic channels
xiii. Extramundane/esoteric channels
xiv. Natural channels.

Each of the group of channels is further briefly discussed below.

Oramedia channels

This group of channels has to do with oral tradition; that is, verbal communication through words of mouth. This is by far the most widely used indigenous means of communication in Africa. Oramedia (oral media) are considered to be more effective than any other means of communication because they are interactive, inter-personal, combine verbal communications with non-verbal codifications, and are simple, natural and less expensive (Osho, 2011). Verbal communication could be achieved in various ways such as mass communication through the use of folktales, town criers, group announcers (as in game hunting), interpersonal communication, group discussion, family talks, meetings, commercial transactions, social gatherings and ceremonies, songs, etc. By and large, through oramedia important geospatial information about features and events is communicated to an audience. For example, through the word of mouth alone, one can give a graphic description of a landscape or the direction leading to a destination.

Visual channels

There is a broad spectrum of visual or graphical forms of communication in Africa. Visual art communication is used for different purposes and communicates different messages. Each graphic sign has its own peculiar meaning, which is well understood by the local people. Some warn people or signify sundry things. Importantly, visual channels are used to, among other things, convey geographic or cartographic concepts.

Examples of non-verbal visual means for conveying meanings or messages include posture or body language, eye contact, gesticulation, facial expression, costume, tribal marks, hairstyles, drama, smoke, road layouts, road markings, markings on tree barks, settlement patterns, traditional architectural works, motifs, graphic arts (drawings), paintings, wall decorative, moldings, pottery, carvings (Fig. 2), sculptures, rock art (Maggs, 1998)), pigments (e.g. black colour communicates gloom and mourning; red signifies danger, fire and war; green conveys life; white connotes purity, simplicity and innocence; brown indicates blighted, parched environment and famine).

Some other forms of visual communication are music, dance, drum messages, signal fires, various forms of graphic symbols (including the pictogram and ideogram), mime, images, sport, lip reading and sign languages used by handicapped persons, etc. (MacBride et al 1981:3, 47). Fig. 1 is an ancient drawing (map) representing an Egyptian gold mine.

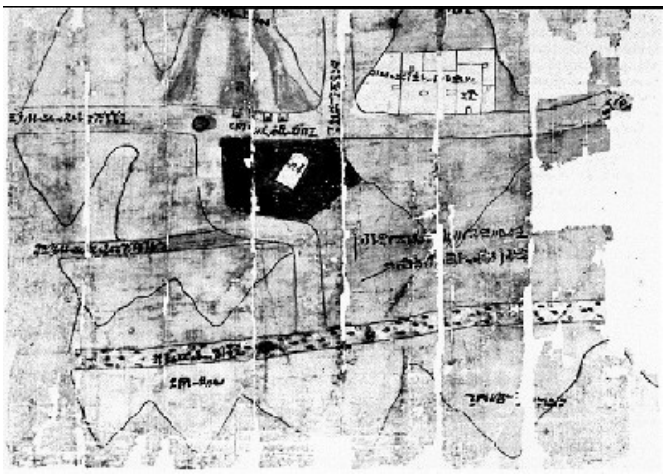

Figure 1: Egyptian Gold Mine Map (c. 1000 BC). Source: http://krygier.owu.edu/krygier_html/geog_222_/geog_222_lo/geog_222_lo05.html. Retrieved 17/11/16.

In Fig. 2 we have a motif map carved on a door depicting aspects of Dogon cosmology and the Dogon migration that took place between the 12th and 15th centuries from ancestral lands to their current location on the Bandiagara Escarpment in Mali. On the second row, the motif on the left represents the river, in the centre is Nomo, the water god. To Nomo's left are turtles, representing long life, and on the right are ducks to represent the Niger River, which the Dogon had to cross in their migration. In the last row, the small circle on the right is a snake, which represents the earth.

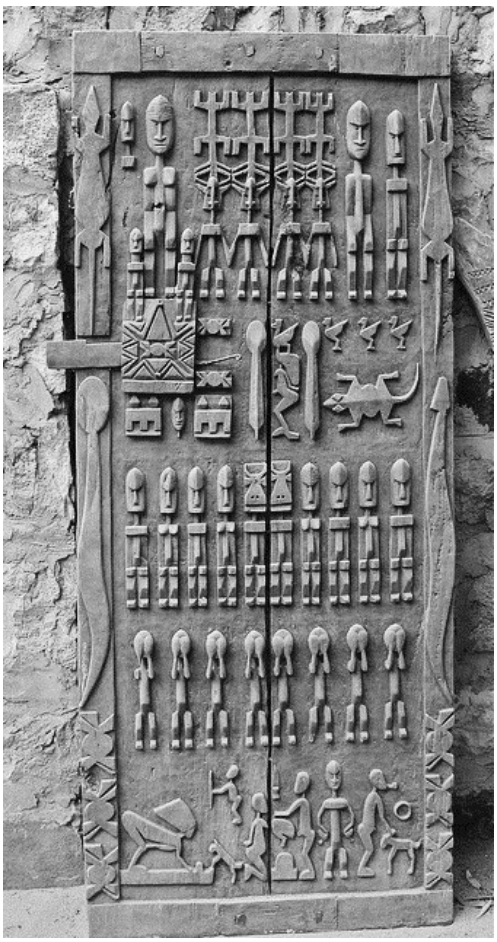

Figure 2: A Dogon motif map carved on a door to depict aspects of ancient Dogon cosmology and migration. Sources: https://www.flickr.com/photos/27784269@N06/5562870747/?ytcheck=1 and https://c2.staticflickr.com/6/5062/5562870747_5dabd8c6fc_z.jpg. Accessed 30/11/16.

Geo-onomastic channels

Generally, geo-onomastic channels are used to descriptively communicate landscape information through the use of geographical names. Specifically, they could be toponyms (place-names), hydronyms (names of water bodies), ethnonyms (names of ethnic groups or cultures), oronyms (names of relief features such as mountains, hills and valleys), choronyms (names of geographical areas, units, districts, or divisions), odonyms (names of roads and other route ways), hagionyms (names of holy, revered, sacred (or even profane) features or places), and so on.

Toponyms and other geographical names are an essential part of cartographic communication, and they play a very crucial role in indigenous communication in Africa. For instance, they fulfill the task of identifying localities thereby distinguishing them from one another (Ormeling, 2007). Moreover, they are required in daily business; they are used to describe our surroundings and to tell others where we have been or where we plan to go; to explain places and events; as cartographic labels for orientation, navigation, recreation, and reference points; to link us to the landscape, and by so doing give useful insight into a people's traditional way of life (Uluocha, 2015).

Demonstrative/Performative channels

A form of mapping could be expressed through certain demonstrative or performative traditional acts such as music, songs, dancing, drama, masquerading, poetry, chants, dirge, incantations, signals, signs, and gesticulations. Apart from social, economic, and emotional matters, these demonstrative channels can effectively be used to communicate environmental issues as well as how such issues could be handled. For instance, Nda and Ekong (2012) explore the utilization of traditional community theatre in communicating the problem of climate change in the African continent. Gesticulation is another very important aspect of demonstrative mode of indigenous communication. From a cartographic perspective, this basically involves communicating geographical information through sign language or gestural movement of some parts of the body.

There are various gesticulatory channels of cartographic communication. A typical example is oral description of route, direction or landscape using notable landmarks coupled with gesticulations to communicate information on the location of features, route direction, spatial relationship, distance, etc. Other examples include eye contact as well as making signs with the hand or head movement to point forward, backwards, right, left, up or down. Sign language could be used to communicate cartographic information to or with the physically and psychologically challenged – i.e. the deaf, dumb, autistic, blind, and lame. Another form of gestural cartographic communication is the demonstrative drawing of invisible or imaginary point, line and area figures, or movement in the air with the finger. Traditional songs and dances are also used to communicate geographical information about features, events, places, etc. The Dogon people of Mali, for instance, perform a ritualistic dance known as the Dama dance. They believe that the Dama dance creates a bridge into the supernatural world (Kwekudee.blog). In other words, the Dogon use the Dama dance to map the symbolic passage of the spirit of the dead from this terrestrial sphere into the spiritual realm.

Body art channels

The human body is a veritable medium of traditional cartographic communication in Africa. Hence, body art (or map) is quite common amongst the people. Body art, which is a variant of visual communication, deals with the outward look of people. In Africa, someone can easily be identified based on certain bodily outlooks such as their physical appearance (e.g. complexion, height, figure or shape), costumes, facial or tribal marks, tattoos, hairdo, and scarifications (incisions).

These channels are particularly effective in graphically communicating geospatial, cultural, demographic and ethnographic information. Observers might infer much from other people's actions, dress, physical appearance and body language (Ogwezzy, 2008). By

observing any of the visible personal attributes in someone, one can rightly tell where they came from or the ethnic or tribal extraction they belonged to. For instance, the Fulani are known to be light complexioned, lanky and with pointed nose; the pigmies of Congo are typically short; etc. Certain body arts, such as tribal marks (Fig. 3), tattoos and scarifications on human body, can also be used analogically, or even metaphorically in Africa as a form of map, to communicate some geographical ideas, beliefs and concepts. For instance, secondary school geography teachers in Oyo State, Nigeria ingeniously use Abaja Alaafin Mefa Mefa the traditional long, horizontal linear scarifications of the people on both sides of the cheek to explain to students aspects of topographical features such as ridges, gully erosions, depressions and river flow.

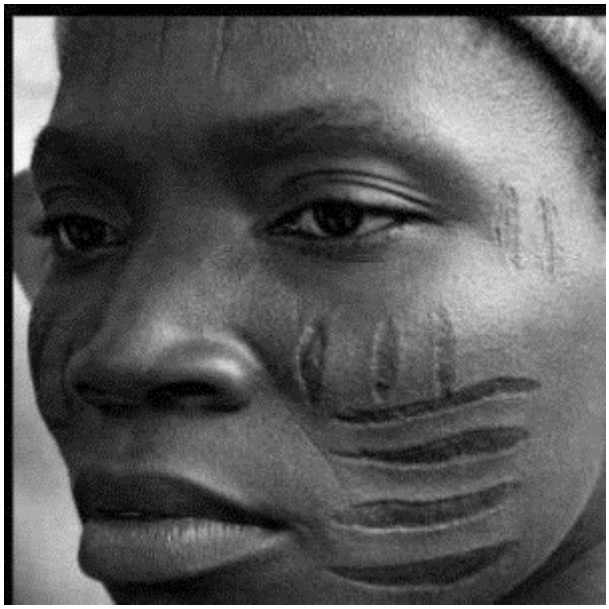

Figure 3: Tribal facial marks and other forms of scarification in Africa are a form of map to communicate topographical information. Source: http://hotnaijanews.com/2013/03/31/can-you-give-your-kid-tribal-marks/

Instrumental channels

These are mostly traditional sound producing instruments used to communicate vital geographical and other forms of information to people. Usually, members of a community would easily interpret a message depending on the instrument used as well as the rhythm, pitch, and tempo of the sound signal produced. The instruments could be used in venue-oriented communication (that is to summon people to a particular location for an event); they can also be used to warn people of an impending or potential danger somewhere; to inform people of the arrival or approach of an important dignitary; to announce the commencement of an occasion; to direct the movement or actions of people; in carrying out emergency as well as search and rescue operations, and so on. Such instruments can be grouped into three namely, membranophones, idiophones, and aerophones (Ogwezzy, 2008). Membranophones include all varieties of skin or leather drum. Idiophones include gong, woodblock, wooden drum, bell, hand shakers, clay pot drum and rattle. Aerophones include flute, whistle, reed pipes, horns, ivory tusk, and trumpets.

Iconographic/Symbolographic channels

This group of communication channels refers to the set of recognized images or symbols used in various fields of activity in a society to communicate certain information, with each icon being recognized by people as having a particular contextual meaning. Accordingly, iconographic media of communication in Africa are usually objectified—they are in material or concrete forms. These include: kola nut, charcoal, white pigeon or fowl, white egg, feather, cowries, totems, mementos, sculptures, pictures, drawing, and flag. Some others are vegetal materials such as the tender unfurled bud of the oil palm frond, leaves tied in certain ways along a path, flowers, crops, and grasses. The spatial location, shape, pattern, density, and arrangement of any of these icons usually communicate certain information and meanings easily comprehensible to the local people.

Closely related to iconographic channels are symbolographic channels, which are also used in different parts of Africa. Symbolographic communication entails a sender using visible signs, signals, symbols, or some other graphic representations to encode and convey a message which is understood by the recipient of the message. It is a descriptive representational device for conveying certain meaning. Some examples of symbolographic media include discernible markings along roads – indicating road used, road to follow, or road to avoid, as the case may be. The markings are usually done with locally available materials such as pigment colours, earth, native chalk, powdery substances, sticks or some other sharp pointed instruments. Such signs could be in form of arrow (→), ⊠, or some other shapes. Other examples are smoke, flame, ashes, knots as well as marks on walls and tree barks. Smoke signal is a particularly important symbolographic channel of communication. It is used to communicate information over long distance. Smoke signals can be used for a number of purposes, such as transmission of news, to send a warning signal, to inform people about any danger lurking around somewhere, summon people to a common meeting area, inform people that someone is still in the farm somewhere, etc. The essence of smoke signals is underscored by an Igbo proverb that says, "Any message sent through smoke must surely and clearly reach to the heavens". In other words, any message communicated through smoke signal must definitely get to the intended recipients.

Ideographic channels

Ideographic, pictographic and logographic media are symbolic scripting systems that utilize visible pictures, abstract graphic symbols, characters or codes instead of words, to denote or illustrate objects, places, activity, sounds, thought, events, ideas or concepts. Basically, ideography, which comprises pictograms (pictures which resemble what they signify) and ideograms (pictures which represent ideas), is a form of writing whereby ideas are transmitted through drawing. Some ideograms serve as way-finding signage, which helps people to navigate an unfamiliar environment. A classic example is the Nsibidi writing (also known as nsibiri, nchibiddi or ncibiddy), which is a kind of cryptic inscription used in some parts of Africa especially Southeastern Nigeria and Western Cameroun (Fig. 4). Another common example is the Hieroglyphic writing system of ancient Egypt. Shahadah (2012) identifies some others, which include Ge'ez (used in Ethiopia and Eritrea), Vai (Liberia), Nubian scripts (Sudan), Osmanya or Cismanya (Somalia), Mwangwego (Malawi), etc. Ideographic channels of communication are still a means of communication in some non-literate cultures in Africa. Generally, however, at present they have limited use in Africa; their usage is no more common and widespread.

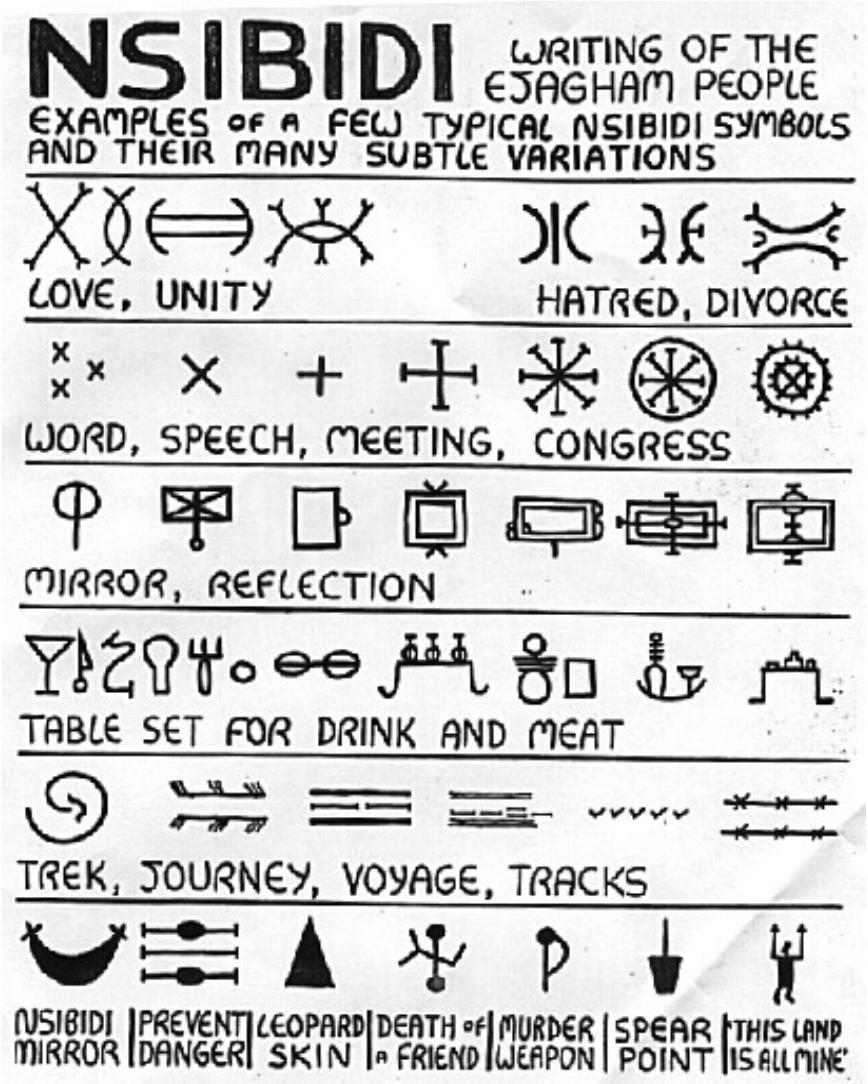

Figure 4: Nsibidi cryptic writings. The ideographic symbols are traditionally used by people in parts of Africa to map and communicate meanings, ideas, emotions, actions, landscape features and so on. Source: https://ig.wikipedia.org/wiki/Ndi_Igbo.

Mensurational channels

This group is a genre of mapping in Africa that reflects in local measurement practices and products. The mensurational channels are employed in taking planimetric (horizontal) and altimetric (vertical) linear distance measurements as well as measurement of areas.

Local instruments include human palm span, arm's length, footprints, footsteps, ropes, long or short slender straight sticks (e.g. broomsticks and bamboo sticks), and oral description. They can be used at different occasions such as when sharing plots of land, demarcating boundaries, workload sharing (e.g. sharing a piece of land to be cleared to various workers), construction of physical structures such as routes, buildings, bridges, village or market squares, etc.

Tactile (or relief) channels

These are channels that directly utilize the solid surface of the earth or some other hard surface medium as a platform for representing and communicating geospatial information in concrete three-dimensional or relief forms. Some of the resultant cartographic products are relatively permanent while others are temporary. Examples include ground mapping, land boundary demarcation, and construction channels.

Ground mapping – This involves drawing ephemeral or permanent maps on ground. According to Rambaldi (2005), drawing maps on the ground is a basic indigenous mapmaking method; it consists of the use of raw materials like soil, pebbles, sticks, and leaves, at the reach of their hands to reproduce the physical and cultural landscapes as they know and perceive them. Such maps serve as temporary instructional aids locally used for teaching, clarification, explanation, or direction. Nineteenth century European explorers of the African continent solicited and obtained from the local Africans maps of areas unknown to Europeans in form of ground maps (Bassett, 1998). Ground mapping may also take the form of road markings, which serve as route guides. Fig. 5 shows a Dogon sand map used for divination. Dogon diviners derive meanings and make predictions from grids and symbols in the sand with the assistance of sacred foxes, which are believed to have supernatural powers.

The Bantu stone circles also known as Bantu Kraals (partly shown Fig. 6(a) and in the rock engravings in Fig. 6(b), constitute an example of a complex permanent indigenous relief map constructed on the ground. The entire stone map is estimated to be composed of roughly 20000 ancient stone ruins found on the edge of an escarpment near Kaapsehoope, Mpumalanga Province in South Africa. The Bantu stone circles is a collection of mysterious stone structures—stone-lined roads, walls, terraces, and the nested circular patterns.

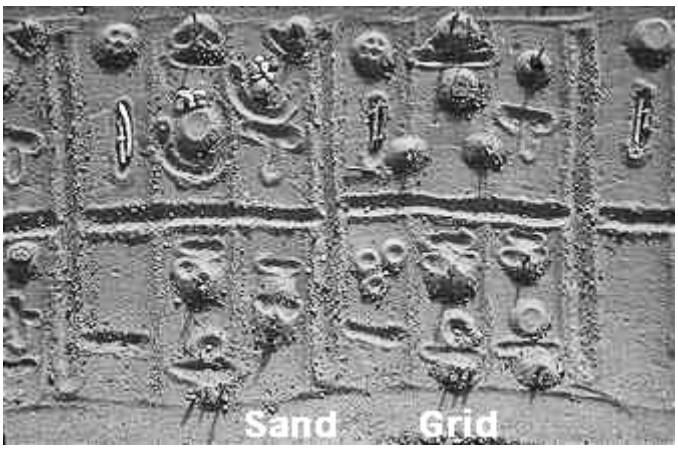

Figure 5: Dogon sand map used in divination.
Source: http://kwekudee-tripdownmemorylane.blogspot.com.ng/2012/12/dogon-people-africas-ancient-gifted.html.

Discovered among the ruins is an antique monolithic calendar called "Adam's Calendar" or Johan Heine Stone Calendar (named after a pilot and firefighter who was the first to identify the ruins of this stone grouping). The Adam's Calendar is a roughly circular stone hedge with multiple astronomical alignments; some of the stones are linearly arranged to line up with the summer and winter solstice, Orion's belt and the four corners of the earth (N,S,E,W), respectively.

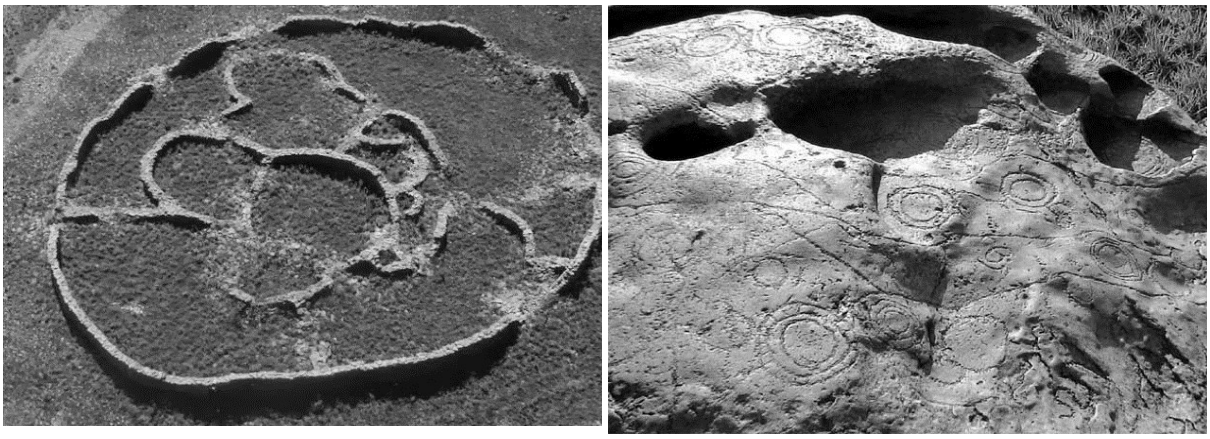

Figure 6: Left: A close-up of the Bantu stone circles; right: Rock engravings of Bantu stone circles. Sources: http://www.visioninconsciousness.org/Ancient_Civilizations_35.htm; http://architectafrica.com/sites/default/files/lydenburgstones12.jpg. Retrieved 12/10/16.

Land boundary demarcation channels are local channels used for establishing temporary or permanent linear or polygonal boundaries on ground. The communication techniques in this category are quite useful in local land administration; it assists in determining ownership, access and control of land in rural areas. It is used in various African communities by heads of families, traditional rulers, chiefs and other community leaders for the allocation of land parcels when sharing family or communal lands for farming and some other purposes. Such channels include construction of mounds or ridges, construction of hedges by planting certain deciduous shrubs or trees along established boundary lines or at endpoints or corners of boundaries, creating and maintaining narrow footpaths along a boundary line; the use of stone hedges; and oral description coupled with gestural signs.

Construction channels are employed by locals to practically communicate cartographic concepts and information in the physical construction of certain structures. For example, such communication easily finds expression in the layout of villages, route alignment, arrangement of bridges, design and orientation of buildings, construction of village squares and market squares, construction of an open space as a venue for an event, and so on. The map in Fig. 7 shows the Benin Walls, which were built as a defensive fortification around Benin City in the

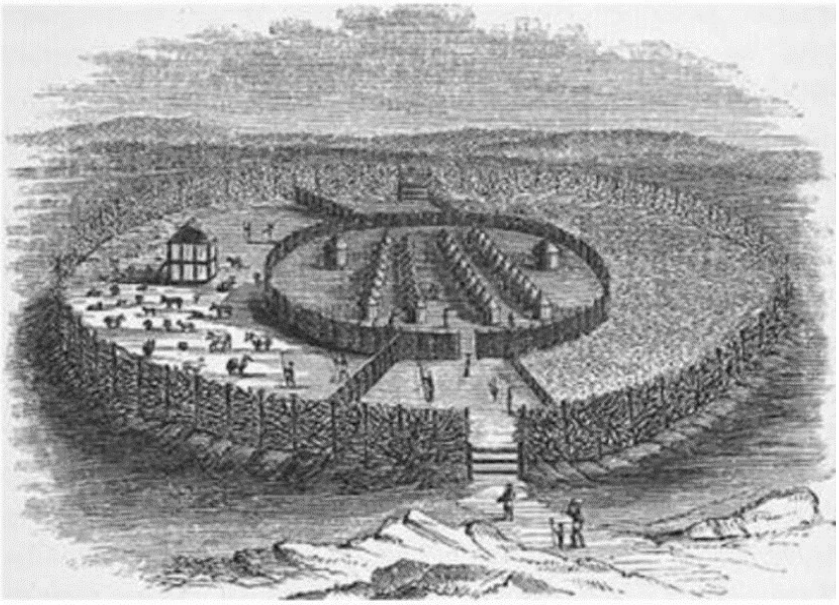

Figure 7: The Great Walls of Benin, Nigeria.

ancient great Benin Kingdom during the time the Kingdom was at its high point and engaged in many wars. The walls are believed to have been constructed between 800 – 1460 AD. In all, it covered a border distance of 16,000km, in a mosaic of more than 500 interconnected settlement boundaries. Hence, the walls are estimated to be four times longer than the Great Wall of China. Altogether, they enclosed an area of 6,500 square kilometres (Pearce, 1999; Wikipedia online Encyclopedia).

Artistic tactile channels are basically motif communicative artefacts in form of woodcut, carvings, sculpturing, moulding, blacksmithing, etc. Some of the artworks are used to depict and relay geographical and landscape information.

Mnemonic channels

This category of indigenous cartographic communication involves the use of visual and tactile aids for retelling origin myths and other stories of historical cultural importance (Bassett, 1998). They may equally involve the use of catchy phrases, folklores, or short stories. Such maps highlight some of the historical geographical elements of a place. A mnemonic map can take various forms such as mental maps (which could be relayed to others through storytelling, or by personally using it to intelligently navigate from one place to another), proverbs, parables, pithy sayings, cliché, wood art, wall painting, rock art, song, scarification, etc.

Cosmographic channels

This has to do with the cartographic description or mapping of aspects of the universe. Cosmographic or cosmological maps are symbolic maps representing a culture's world view or beliefs about the world. Indigenous African people not only know about the terrestrial, they also possess some knowledge of the celestial. Through observations, experience and oral tradition they acquire knowledge about heavenly bodies, movements, events and relationships; and they transmit such knowledge via various means, including cartography. Figures 8 - 10 are antique cosmographic maps produced by Africans.

Fig. 8 depicts a redrawn map of the Maa Aankh Cosmogram. The Maa Aankh Kongo Cross, (also known as Kamta, Kongo Cross, or BaKongo "four moments of the sun"), originated from the Bantu-Kongo (or BaKongo) people in the Kongo – Angolan region of Central Africa. The Maa Aankh consists of TASETT (the land above) and KAMTA (the land below) symbolizing Earth surrounded by four solar discs. TASETT and KAMTA are separated by a blue sea. The Maa Aankh is basically a map traditionally used by the people to physically and metaphysically describe the four stages of the sun corresponding to various phases of both the physical and spiritual life of human beings. Metaphorically, TASETT (the red lands) represents the physical world and our Lower Self (or Lower Kamit), which is ruled by Set. On the other hand, KAMTA symbolizes the land below (the black lands (Upper Kamit or Spiritual World)) ruled by Osar. Physically speaking, the four solar discs symbolize the four moments of the sun: sunrise (Kala – black), midday (Tukula – red), sunset (Luvemba – white) and midnight (Musoni – yellow, when the sun is believed to be shinning on the other side). The fundamental metaphysical understanding of the Kongo Cross is that just like the sun rises in the east (Kala), peaks at midday (Tukula), sets in west (Luvemba) and is mysteriously reborn at midnight (Musoni), also the human soul, which reflects the cycle of the sun through birth, life and death will also be mysteriously reborn provided (he or she is righteous). In metaphysical terms, the four solar discs signify human

soul and correspond exactly to the four Kamitic Amun Ra divinities namely: birth – Khepera (Creative Ra or Creative Power), life – Ra (Authoritative Ra or Overseeing Power), death – Ra Atum (Complete Ra or simply the Power of Revolution) and rebirth – Amun Ra (Hidden Ra or Hidden Power).

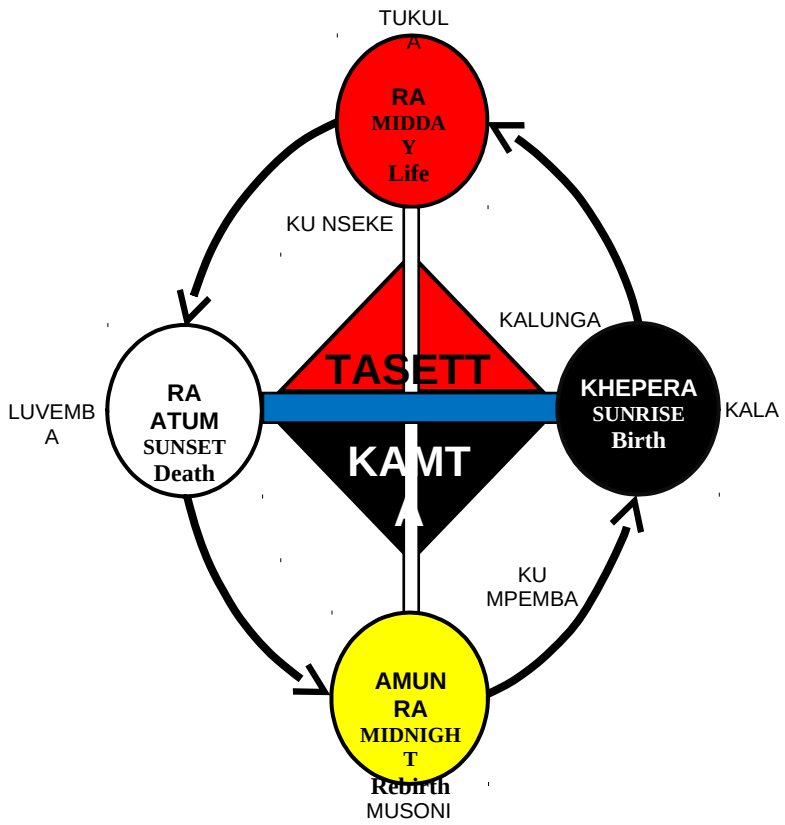

Figure 8: Redrawn map of Maa Aankh Cosmogram. Sources: https://landofkam.wordpress.com/2014/09/20/practicing-the-maa-aankh-kamitic-rigteous-living; http:1solalliance.jigsy.com/books/maa_aankh.

A map of the ancient Egyptian concept of a geocentric flat Earth is shown in Fig. 9. This map was used to portray the cosmological belief of the world as a flat disk floating in a circular ocean Nun. According to ancient Egyptian mythology, Geb (the god of earth) was often found lying on a flat ground beneath his mother Nut (or Nuit) - the goddess of sky, shown here as the arching female decorated with stars. Geb's posture symbolized the hills and valleys of the land. In between is his father Sho [or Shu, the air god] who provided extra support to the sky. When Nut was separated from Geb, he wept bitterly and his tears became the water of the oceans of the world, covered by a celestial canopy of stars borne by Nut.

Figure 9: Map of the Egyptian geocentric flat Earth. Sources: http://www.exohuman.com/wordpress/2016/06/the-earth-is-flat/; https://relevancy22.blogspot.com.ng/2013/03/how-to-interpret-creation-story-of.html; https://en.wikipedia.org/wiki/Egyptian_mythology. Retrieved 9/12/16.

Figure 10 is a cosmographic map showing the Egyptian "Four Moments of the Sun". Figure 10 (left) is an engraved, bas-relief of the "Four Moments of the Sun", while Figure 10 (right) is an annotated drawing version of it. It is similar to the Maa Aankh shown in Figure 8. It metaphorically portrays Egypt being overarched by the goddess Nut (350 BC) with the Sun traveling through her body (rising, noon and setting Sun) and Hathor/Isis as the secondary arch. Sho (the god of air) is shown down below with upheld arms and foot. (See also Figure 9). The top half of the map portrays the physical world. The bottom half is the spiritual world. The sun with the snakes (light rays) is traveling in a counter clockwise motion.

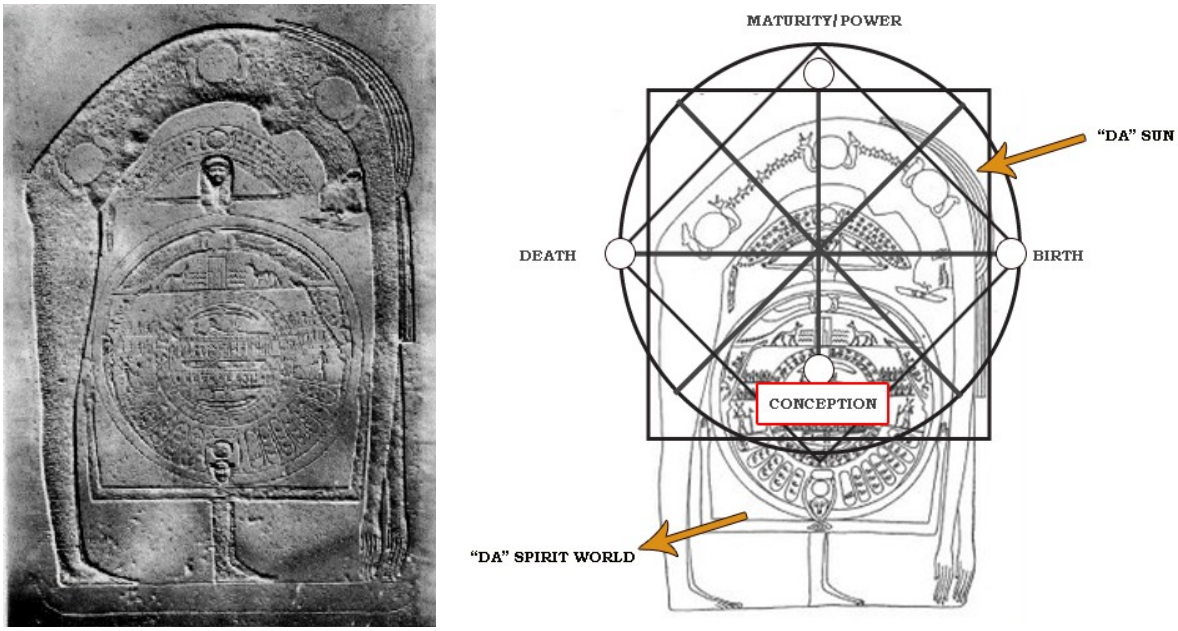

Figure 10: Left: Engraved Egyptian "Four Moments of the Sun". Source: http://trelleoftears.tumblr.com/post/23578108445/four-moments-of-the-sun-diagram-of-the-law-of). Right: Redrawn and annotated Egyptian "Four Moments of the Sun".

Extramundane/esoteric channels

According to Wilson (1988), this is the mode of communication between the living and the dead, the supernatural or Supreme Being. This is usually done through incantation, spiritual chants, ritual, prayers, sacrifice, invocation, trance, hysterics, libation, mythical drawings (e.g. with native chalks), and so on. In their extramundane communication, local people equally employ cartographic concepts of location, direction, distance, geometric form, magnitude, generalization, grouping, ordering, and so on. (see fig. 11). As noted by Noxolo (URL):

> "… the *function* of maps, the purpose of spatial representation in indigenous Caribbean and African cartography, is often to connect the earthly with the spiritual, to make visible the links that are not evident, and the *sine qua non* of this is the connection of body with landscape. Maps can of course lend a spiritual weight to earthly authority: for example young people's initiation into society can involve standing on maps as a symbol of their strong relationship with place …, whilst map-making can be critically interpreted as part of the role of 'the priest-shamans in constructing the moral order by manipulating the cosmological order' … At the same time the everyday use of maps that are the design of village, house or fabric for example … becomes intrinsic to the patterns of everyday living, which makes maps function as banal tools of orientation, enabling the user to participate through everyday practice in a range of spiritual and physical relationships …"

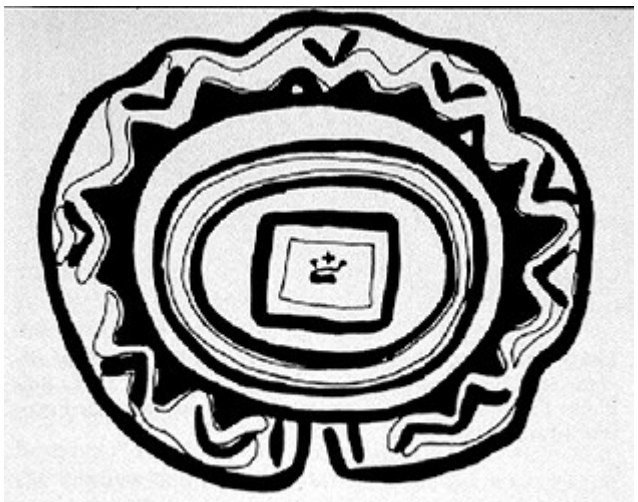

Figure 11: A North African map showing the tortuous life path to death and then path to afterlife. Source: http://krygier.owu.edu/krygier_html/geog_222/geog_222_lo/geog_222_lo05.html. Retrieved 17/11/16

Natural channels

This form of indigenous cartography more or less involves reading and interpreting natural maps of the immediate landscape or environmental. Nature communicates cartographically everywhere! Every landscape is a complex amalgam of cartographic realities. Landscape – anytime and anywhere – is one huge, real and life-size composite natural map, made up of many different thematic layers of features. The spatial location, distribution, arrangement, interrelation, and interaction of various natural and man-made phenomena constitute some form of maps—natural maps, if you like. Simply put, nature itself is a general map, being composed of many different natural and cultural features. Any discerning mind can read and interpret any portion of this natural map with some measure of accuracy. Through the process of observation and induction, people are able to decode the message being relayed by nature somewhere and infer the meanings therein. African indigenous people are very much aware of the fact that nature itself is a map of some sort. Local people often perceive their landscape or environment as containing maps that can be read and used. Accordingly, in various communities they have equally developed some skill and means of reading and interpreting the natural map around them. In this way, indigenous cartographic communication can take place through direct field observation and analysis of certain natural and/or cultural phenomena.

Cartography is not only about mapmaking; it equally involves the reading, analysis, use and study of maps. In various ways, the indigenous people of Africa often display their dexterity in reading, interpretation and utilization of the 'mapped' information within their geographical milieu. For instance, during a hunting expedition, hunters can use animal footprints and droppings to trace, trail and hunt down the game. Also the possible onset of a rainstorm at a place(s) can be predicted by observing and analyzing the nature and spatial distribution of clouds. (cp. Mundy and Compton, 1991; Mundy and Lloyd-Laney, 1992). In the same vein, based on their accumulated knowledge of their environment, local people are able to make accurate prediction of the spatio-temporal trend of certain events. For example, based on their indigenous knowledge and mental map, they can fairly forecast the cycle of flooding of a river, the onset of an invasive insect or pest. (See also Efa et al 2010).

5. Conclusion

The foregoing has largely been an attempt to classify indigenous cartographic channels in Africa. A considerable amount of scholarly work has been done on African indigenous communication in general. At various times, authors have tried to – among other issues – identify and classify the various forms of indigenous communication media in Africa. On the other hand, little has been done with respect to formal study, documentation and classification of indigenous cartographic communication modes and channels within the continent of Africa. In this respect, however, the seminal works of Bassett (1998), Woodward & Lewis (1998), and Uluocha (2003, 2010, 2015), are particularly worthy of mention. Nonetheless, the field of indigenous African cartography is still largely a virgin academic forest waiting to be thoroughly explored and conquered. Much more intellectual searchlight needs to be beamed on this rather unique genre of cartographic communication. The classification of the local African cartographic communication channels done here should not be considered to be strict, exhaustive and exclusive. Rather, overlaps and omissions are possible. More research work in the area of identification and classification of indigenous African cartographic communication channels will be a welcome development. Expectedly, the taxonomical scheme presented here can serve as a useful guide.

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