

Continental Comparison of Human Development Index (HDI)

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Abstract: *Documentary analysis research design was used in this study to reliably, validly, authentically, and accurately ascertain the Human Development Index (HDI) of countries for comparison of continents in the world as objectively measured by the United Nations Development Programme via the World Wide Web. The investigation examined the three HDI indicators (long and healthy life, access to knowledge and quality education, and a decent standard of living) obtained from the different countries in the world and compared the HDI of the seven continents worldwide. A proportionally stratified sample of 182 was drawn from the 253 countries across continents in the globe for the study. Analysis of Variance and Bonferroni Post Hoc Test were adopted to test the null hypothesis of no significant continental difference in Human Development Index at 0.05 alpha. Results showed that Africa has HDI mean of 0.536 which is significantly lower than that for each of the other continents in the world (Asia 0.714, Europe 0.845, North America 0.733, South America 0.738, and Oceania 0.693), and the global average of 0.697. Europe has the highest HDI with significant overwhelming preponderance over the world average and greater than that of all other continents in the universe. Asia, North America, South America, and Oceania do not differ significantly in their HDI. Each African country should do everything possible to guarantee the three HDI indicators for all its citizenry to radically improve the Human Development Index of Africa. Every country in each continent is charged to fervently improve its Human Development Index by passionately striving at and actually attaining the peak of HDI for the world to essentially arrive at the ideal Human Development Index of 1.00.*

Keywords: *Human Development Index; Continental difference; Continents; United Nations Development Programme; HDI; HDI indicators; Long healthy life; Access to knowledge and quality education; Decent standard of living; Countries; Europe; Africa.*

1. INTRODUCTION

Man is the highest of all creatures primarily because nature has endowed the human being with the highest intelligence that guarantees him virtually limitless potentials for development (Kpolovie, 2016b; 2012b; 2012c; Jolly, Emmerij & Ghai, 2004). Human Development is the creation of fair opportunities and choices for all individuals that guarantee the expansion of the richness of human life. Human Development (HD) is the giving of people much more freedom and opportunities to live the kind of lives that they value most. It is the development of people's abilities and the provision of the chance for them to fully utilize the abilities. Human development is attained by a healthy and creative life of knowledge ability and quality education, and easy access to the necessary resources for a decent standard of living.

Human Development is concerned mainly with guaranteeing long and healthy life, knowledge and quality education, and a decent standard of living; as well as the creation of conducive conditions for the people to actively participate in the political and community life, environmental sustainability, protection of human rights and human security, and ensuring of gender equity (Alamieyeseigha & Kpolovie, 2013; Atkinson, 2015). Human development also covers the creation of a suitable environment for people to collectively and individually develop to their maximum potentials and to actually live the most productive and creative life of greatest value. In other words, human development goes far beyond Gross Domestic Product (GDP) to emphasize actual creation and sustenance of a flourishing wellbeing and welfare for the people.

Human development, according to Nations Online (2016) has since 2011 gone beyond national income on the basis of which Norway followed by Australia and the Netherlands ranked top and

Burundi, Niger and Democratic Republic of Congo ranked from the bottom. Human Development in today's life is first and foremost about, allowing people to lead the kind of life they choose, and secondly, providing the people with the requisite tools and opportunities to make those choices a practical reality. Human Development now embodies Human Development Index (HDI); life expectancy at birth; many years of schooling; expected years of schooling; Gross National Income (GNI) per capita; GDI minus HDI; and non-income HDI; all of which can be summarized in a long healthy life, knowledge, and a decent standard of living. Human development in this sense is an alternative measure of national development that depicts equity and sustainable better future for all. The components of human development are defined by Nations Online (2016, 29) thus:

- *Human Development Index (HDI)*: A composite index for measuring average achievement in three basic dimensions of human development (a long and healthy life, knowledge and a decent standard of living).
- *Life expectancy at birth*: Number of years that a newborn infant is expected to live if prevailing patterns of age-specific mortality rates at the time of birth stay the same throughout the infant's life.
- *Mean years of schooling*: Average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level.
- *Expected years of schooling*: Number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life.
- *Gross National Income (GNI) per capita*: Aggregate income of an economy generated by its production and its ownership of factors of production, less the incomes paid for the use of factors of production owned by the rest of the world, converted to international dollars, using Purchasing Power Parity (PPP) rates, divided by midyear population.
- *GNI per capita rank minus HDI rank*: Difference in rankings by GNI per capita and by the HDI in which a negative value means that the country is better ranked by GNI than by the HDI.
- *Non-income HDI*: Value of the HDI computed from the life expectancy and education indicators only.
- *Long and healthy life*: as measured by life expectancy at birth.
- *Knowledge*: as measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary and tertiary gross enrollment ratio (with one-third weight).
- *A decent standard of living*: as measured by GDP per capita that is the value of all goods and services produced in the economy divided by the population (Nations Online, 2016).

Human development has three major generally acceptable indicators or dimensions that are: 1) a healthy long life, 2) access to knowledge/quality education, and 3) a decent living standard (UNDP, 2016; 2016a; Social Science Research Council, 2015; Nation Master, 2015; Roser, 2015; Blanchflower & Oswald, 2005; Nations Online, 2016; Economic Times, 2016; European University Institute, 2016). The aggregate of equal contributions of these three indicators to human development as measured validly and reliably by the United Nations Development Programme (2015; 2015a) is what has come to be termed as Human Development Index (HDI). Due to the robust nature of these three indicators, the extent to which each country is developed in comparison with other countries world-over is currently better measured with Human Development Index unlike the past that such measurement was done with national economic growth alone (Global Footprint, 2015; Hack & Treeten, 1979; Stanton, 2007; UNDP, 2015b).

Collection and analyses of data on a healthy and long life (Hosseinpoor, Bergen & Schlotheuber, 2016), access to knowledge and quality education (OECD, 2015), and a decent standard of living (Pew Research Center, 2015) for determination of Human Development Index (United Nation Development Programme, 2015) for the various countries in the world are made possible with efficient use of Information and Communication Technology (Nafukho & Irby, 2015). "Information and Communication Technology (ICT) has so revolutionized all spheres of human endeavor to the extent that its effective and efficient use or otherwise in any area is synonymous with the success or

failure, respectively, of that field” (Kpolovie, 2011). With ICT deployment via statistical software like IBM SPSS (Kpolovie, 2017), the current study shall collect Human Development Index data across the globe and analyze them for determination of continental differences, if such a difference exists significantly. The essence of the current investigation is anchored on the fact that previous works on Human Development Index from its introduction by Mahbub ul Haq in 1990 till date have only compared countries and not continents for possible significant difference (Haq, 1990; UNDP, 2016; 2015; 1990a; Global Footprint Network, 2015; Chowdhury, 1991; Stanton, 2007; Roser, 2015; Pew Research Center, 2015; United Nation Development Programme, 2015). Every year since 1990, the United Nation Development Programme (2015; 2015a; UNDP, 2005) ranks countries, not continents, based on their Human Development Index. This great knowledge lacuna that does exist shall hopefully be filled by findings of the current investigation.

2. LITERATURE REVIEW

Human Development Index (HDI) is very aptly defined by the Economic Times (2016) as “a statistical tool used to measure a country’s overall achievement in its social and economic dimensions. The social and economic aspects of a country are based on the health of people, their level of education attainment and their standard of living”. This definition implies that the calculation of HDI is an accumulation of three core indicators of a nation’s social and economic development. The primary indicators are life expectancy for health, expected years of schooling as well as the actual years of schooling for education, and the Gross National Income (GNI) per capita for the standard of living.

The technicalities involved in the measurement of the three essential indicators of Human Development Index require being mentioned very briefly here for a better grasp of the complexity of HDI computation. The geometric mean of standardized and normalized indices for each of the three dimensions (long healthy life, education, and living standard) is used for expression of HDI. After collection of the data from the valid and reliable sources, the calculation of HDI is in two phases which are a) creation of the dimensional indices, and b) aggregation of the dimensional indices (UNDP, 2016).

At the first phase, lower and upper limits are set for a transformation of the indicators that are expressed in Z-scores with a mean of 0 and a standard deviation of 1 (Kpolovie, 2014; 2016, 2010) into standard score units that range between 0 and 1. These boundaries respectively indicate the state of nature which is zero and the ideal or aspirational state that is ultimately 1. For instance, the minimum boundary for life expectancy has a mean of 20 because historical evidence has shown that every country from the 20th century to date has a life expectancy that is not less than 20 years, while the maximum limit for life expectancy has a mean of 85 years. The expected years of schooling have 0 as the minimum limit as education in each nation begins from birth to grave; the expected mean of education is 18, which is the expected years of schooling for obtaining a master’s degree in most nations by 2025 projection (OECD, 2015). Gross National Income per capita as a measure of standard of living has a minimum mean of \$100 with maximum mean that is set at \$75,000 per capita GNI. The minimum \$100 per capita GNI purchasing power parity (PPP) is anchored on historical evidence over the past century that every nation has a great deal of unmeasured subsistence and nonmarket production that is not captured in the official economic data. The maximum mean of \$75,000 per capita GNI PPP is because less than four countries are expected on the basis of yearly growth projection of 5 percent to exceed \$75,000 in the next five years (UNDP, 2016; 2015).

The second phase of scientific measurement of HDI deals with obtaining the geometric mean of the three core indicators namely health, education, and a decent standard of living; and aggregating them. The distributions of HDI are observed over different units. While the life expectancy or health is distributed across a hypothetical cohort; the knowledge ability, quality education or years of schooling; and the decent standard of living or income are distributed across individuals. In other words, the HDI distribution is presented over age intervals such as 0–1, 1–5, 5–10, and 10–15, down to 85 and above. The mortality rate is also used and measured with an average age at death specified for each interval (OECD, 2016; WHO, 2010a; Programmed Aging, 2009). For education, the mean years of schooling, using household survey data that have been harmonized in international databases, such as the Luxembourg Income Study, Eurostat’s European Union survey of income and living conditions, the World Bank’s international income distribution database, and the United Nations Children’s Fund’s multiple indicators cluster survey, are used. Estimates of GNI per capita purchasing

power parity in the World Bank's 2015 database is used for measuring standard of living (World Bank, 2015) after the official comparison rates by the International Comparison Programme for countries has been produced.

Multidimensional Poverty Index (MPI) from micro household data surveys are also employed to identify multiple deprivations of households in education, health and standard of living (Kovacevic & Calderon, 2014). Every individual gets a deprivation score in accordance with his family's deprivations in each of the aggregated three HDI indicators such that 33.33 percent is the maximum obtainable for each of the health, education, and living standard dimensions. A multidimensionally poor household (plus everyone in it) is that which the total of its deprivation scores are equal to or greater than 33.33 which is one-third of the total maximum score of 100. A household with a total deprivation score within 20.00 and 33.22 is classified to be near multidimensional poverty. At the extreme, a 'severely multidimensionally poor household' is the one with a total deprivation score from 50 percent and above. The measurement of multidimensional poverty plays a central role in Human Development Index, particularly when Human Development is viewed as defined by the Social Science Research Council (2016, 1) as "the process of enlarging people's freedoms and opportunities and improving their wellbeing. Human development is about the real freedom ordinary people have to decide who to be, what to do, and how to live". What qualifies a household to be a deprived one (UNDP, 2015b) are as shown in Table 1.

Table1. *Components of HDI indicators*

Core Indicators	Sub Indicators	Conditions
Healthy long life	Nutrition	A household member is malnourished, as measured by the body mass index for female adults aged within 15 to 49 or by the height-for-age Z-score calculated using World Health Organization standards for children under age 5
	Child Mortality	A child has died in the household within the five years before the survey
Quality Education or Knowledge ability	School attainment	No household member has completed at least six years of schooling
	School attendance	A school-age child 11 to 13-year-old is not attending secondary or middle school
Standard of Living	Electricity	Not having access to electricity
	Drinking water	Not having access to clean drinking water that is within 30 minutes normal walking distance
	Sanitation	Lack of access to improved sanitation that is not shared (i.e., not public)
	Cooking fuel	Using dirty cooking fuel such as firewood, charcoal, or dung
	House-type	Living in a home that is a mud house with thatch roof; dung floor; sandy floor or floor that is not tiled
	ICT assets	Lacks at least one information-related asset such as functional computer, telephone, television, or radio
	Mobility assets	Lacks usable mobility-related assets like a car, truck, motorbike, motorboat, or animal cart
	Livelihood assets	Lacks usable arable land, refrigerator, or livestock (at least a horse, a head of cattle, five goats, five sheep or 30 chickens)

Gender differences in the indices are then harmonized to arrive at the composite HDI for each country (International Monetary Fund, 2015) by the principles of international statistics (UNDP, 2015b; 2015c). Sustainability of scientific, technological, social, political, economic, and environmental development relies heavily on statistics that statisticians professionally gather, analyze, and interpret transparently, impartially, reliably, and validly. The emergence and sustained use of Human Development Index lies primarily on statistical data collected, analyzed, synthesized and evaluated by international principles of best practices that are based on fundamental characteristics that chiefly include:

- High quality and globally accessible to all.
- Highest professional production standards that ensure scientific impartiality and transparency.
- Use of sources and methods that guarantee timeliness and cost-efficiency.
- Multilateral coordination and cooperation across countries.

International statistics guarantees high quality and globally accessible data to all. This is done to ensure that vital statistics of various countries are made available and disseminated internationally for free public accessibility. Works on global Human Development Index information like the current study are anchored substantially on this principle. Regular consultations with primary users in and outside relevant organizations are done for periodic reviews of statistical programs to maintain high-quality statistical information globally. Landmark decisions about statistical work programs as well as reports on statistical meetings are publicly made available at no cost. The development and promulgation of methods, good practices, and standards of statistics from progressive national statistical offices and other national organizations for official statistics are synergized and published online for the generality of the public to adopt. In this way, the implementation of internationally agreed statistical standards is carefully monitored to avoid conflicts of interest. The continental comparison of HDI in the current investigation is aimed at arriving a central unit of such general principles that will at a glance reveal the relative position of each continent world-over in Human Development Index.

Human Development Index is a product of highest professional statistical standards that ensure scientific impartiality and transparency. HDI strictly employs professional considerations for arriving at a decision on terminology, methodology, codes of conduct, data collection, and processing procedures, and according credit to the source of data to clearly distinguish between policy-advocacy comments and analytical comments in the dissemination of information. Individual data collected by legal entities and natural persons and subjects' aggregations pertaining federal confidentiality rules are strictly kept confidential while using the data exclusively for the statistical purpose. Human Development Index takes stringent measures to prevent overt or covert disclosure of data on households, respondents, and businesses. It has inbuilt framework for describing methods and procedures to allow anonymous micro-data for further analysis as done in this investigation and subsequent replication studies by qualified researchers.

Human Development Index uses sources and methods that guarantee timeliness (Charmes, 2015) and cost-efficiency in the gathering, analysis, and communication of findings of data from the various countries worldwide. It applies the foundational principles of official statistics to globally encompass national statistical offices as well as other national organizations that deal with official statistics to minimize the burden on data providers on the one hand, and to improve the timeliness of international statistics (Global Entrepreneurship Association (2015)). HDI not only allows but practically encourages the joint collection of data and the sharing of collected data with other statistical organizations with a view to the presentation of much more integrated statistical programs that clarify and harmonize existing gaps and overlaps (Atkinson, 2015).

Multilateral coordination and cooperation across countries are a unique characteristic of international statistics that is adopted in HDI. Human Development Index statistical analysis is anchored on the principle of collaboration and sharing of knowledge among the various nations, regions, and international organizations to enhancing further development of national, regional, continental, and global statistical systems. It requires the active participation of all stakeholders in international statistical multilateral and bilateral consultations and statistical meetings to arrive at the series of possibilities to consider or accept and use authoritatively for every important set of statistics (Pollin, 2015). The HDI takes cognizance of local circumstances and phases of statistical evolution by promoting more advanced cooperation projects, and coordination of technical cooperation on the user requirements via full participation of all the stakeholders.

Human development was defined traditionally solely regarding the performance of the economy of a given country; and virtually measured with the Gross Domestic Product (GDP) of the country (Hick & Streeten, 1979). Haq (1990) saw great inadequacy in the traditional definition and measurement of human development because it did not adequately account for the real purpose of development, which is the improvement of human lives. In particular, he believed that the commonly used measure of Gross Domestic Product failed to sufficiently measure human wellbeing in a given society. Haq (1990; 1999) then defined human development as "the process of enlarging people's freedoms and opportunities and improving their wellbeing. Human development is about the real freedom ordinary people have to decide who to be, what to do, and how to live" (Social Science Research Council, 2016). Human development in this broader sense could only be measured in relations to human capabilities that can only attain its fullness when a healthy long life, easy access to quality education,

and a decent standard of living are guaranteed. The new perspective that much later came to take center stage of human development laid much emphasis on the creation of a conducive environment on the one hand, and the role that the individual must personally play to actualize his vision of a good life on the other hand. This proposition differed dramatically from the then traditional view to the extent that other economists at the time declared Mahbub ul Haq as a “heretic among economists” (The Economist, 1998). In fact, far from being an economic heretic, Mahbub is celebrated in this century, and perhaps in the centuries to come, as the greatest economist as Human Development and Human Development Index is viewed and measured in accordance with the postulation of Haq (1990).

From the 1990 till date, the United Nation Development Programme (UNDP) has annually published Human Development Reports that are readily available on the UNDP platform with this functional link <http://hdrnet.org/view/subjects/20o.html> or this other link <http://hdr.undp.org/en/data> as a composite score that best represents Human Development Index for each country around the world that is derived from the three dimensions of:

- A long and healthy life
- Access to knowledge and quality education
- A decent standard of living.

Please, just click either of the two links to freely access and study the Human Development Reports published by UNDP from 1990 to date (Human Development Resource Net, 2016; UNDP, 2015c; Wikipedia, 2016f) for countries all over the world. Human Development Index computed from about the same three indicators has also been published annually for the American (Social Science Research Council, 2016). There is general consensus universally that a long healthy life, access to knowledge and quality education, and a decent standard of living are the core components of Human Development Index (European University Institute, 2016; EUROSTAT, 2015; Nation Master, 2015; Quora, 2016; Blanchflower & Oswald, 2005; Chodhury, 1991; Lee, Park, Khosnood, Hsieh, & Mittendorf, 1997; Global Footprint Network, 2015; Stanton, 2007; United Nations Development Programme, 2015; 2015a). Even Chowdhury (1991) in his criticism of human development index could not dispute the three core indicators, health, access to knowledge, and a decent standard of living as a good agglomeration of HDI.

A long healthy life is the indisputable capacity of highest value that every person has. A lifeless human body will have virtually nothing to do with access to knowledge/education, and standard of living. This accounts for why the first and foremost capacity for human development index is a long and healthy life. The opportunities that will make people to successfully avoid premature death, to be protected arbitrary denial of life, and to prevent disease and injury must be created and improved upon regularly throughout a country for a good HDI. The most possible physical and mental health of the people must be guaranteed. The highest possible quality medical care, healthy environment, and constant practice of living a maximally healthy lifestyle must be created and sustained. While infant mortality demands to end (Lee, Park, Khosnood, Hsieh & Mittendorf, 1997), life expectancy at birth which is ‘the average number of years that a newly born baby is expected to live if the current mortality patterns continue all through his lifetime’ must be extremely optimized (Kpolovie, Oshodi & Iwuchukwu, 2016). Excellent nutrition levels, free access to good healthcare services and a very high life expectancy at birth constitute a significant measure of the quality of life in HDI.

Access to knowledge and quality education in the best form is indispensable for individuals’ freedom, self-sufficiency, self-actualization, and self-determination that human development index demands. No person can be said to be genuinely having the freedom to decide what to rightly do and become who he best values to be without first having excellent formal education at great heights (Kpolovie & Awusaku, 2016). Early school enrolment, long enough length of time in schooling, and the attainment of a sound first degree at age 25 and master’s degree at the age of 28 is used for measuring of the education indicator of HDI for the population. In this age of globalization, it is extraordinarily difficult for a person without good education to have a secure economic livelihood, peace of mind, self-sufficiency, and self-respect. This is because education is the inexorable tool for skills acquisition, self-confidence development, dignity building, status attainment, and horizons broadening of positive possibilities (Kpolovie & Iderima, 2013; 2016; Kpolovie, Iderima & Ololube, 2014).

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A decent standard of living, reflected in Gross National Income (GNI) per capita purchasing power parity (PPP), is crucially essential for human development index determination for a people. Unfailing legitimate and steadily increasing income is vital for the meeting of human needs for physical, safety, gregariousness, esteem, and self-actualization development as postulated in Maslow's Hierarchy of needs (McLeod, 2016). The Social Science Research Council (2016) upheld that income is a necessary means to a host of critical ends, such as a safe and clean living environment, quality education, good health, security in illness and old age, and even have a say in the decisions that affect a person's life. The Christian religious book, the Holy Bible, has it that money answers all things. The absence of good income prevents valuable options and alternatives, and substantially limits access to several opportunities, thereby restricting life chances that human development index for a people demands.

On the whole, countries low on Human Development Index tend to have annual population growth rates that range from 1.5 percent and above; population in urban areas that is less than 35 percent; and an under-15 population that significantly outnumbers those who are above 65 years. On the contrary, countries that are high on HDI tend to have annual population growth rates of 1 percent or less; high urban population percentages ranging from 65 and above; and an equal percentages of people who are under 15 and above 65 years of age. Based on these parameters, Nation Master (2015) gave a ten-point summary of Human Development Index in 2006 for the various countries in the world as follows:

- Australia ranked first for HDI amongst Hot countries.
- Norway ranked first for HDI amongst Christian countries.
- Brunei ranked first for HDI amongst Muslim countries.
- Iceland ranked first for HDI amongst Heavily indebted countries.
- Argentina ranked first for HDI amongst Emerging markets.
- Canada ranked second for HDI amongst Former British colonies.
- Luxembourg ranked first for HDI amongst the European Union.
- Israel ranked first for HDI amongst Middle Eastern and North African countries.
- All of the bottom 24 countries by HDI are Sub-Saharan Africa countries.
- Lebanon ranked first for HDI amongst Former French colonies.

A Human Development Index that is 0.8 and above for a country is considered and classified as a high HDI (Global Footprint Network, 2015). This means that the country in question has a universally acclaimed high average achievements in the three crucial areas of long healthy life, access to knowledge and quality education, and a decent standard of living that is significantly better than those of 80 percent of all other countries in the world. The HDI of the past years tends to show that for each year, not more than 15 percent of countries globally get HDI that is up to or higher than 0.8.

3. METHODOLOGY

Documentary analysis research design was used for this study. The documentary analysis research design (Kpolovie, 2010; Kpolovie & Obilor, 2013; 2013a; 2013b; 2013c) guarantees reliability, validity, authenticity, and accuracy (Kpolovie, 2017; 2017a; 2016; 2014a) in ascertaining the Human Development Index of countries for comparison of continents in the world as objectively measured by the United Nations Development Programme (2015, 2015a). In the 21st century, documental analysis is a very crucial research design that allows for gathering of both secondary and primary data qualitatively and quantitatively from the World Wide Web through internal and external criticisms for authenticity, accuracy, validity and reliability of the online data source (Kpolovie, 2010; 2016; Kpolovie & Obilor, 2013; 2013a). The universally valid and reliable online Human Development Index as unquestionably reported by the United Nations Development Index (2015; 2015a) was used as the data source of the current investigation (Wikipedia, 2016). The UNDP (2016a; 2016b) and United Nations Development Programme (2015; 2015a) data on global Human Development Index were validly and reliably generated over the required time from each country on the basis of excellent research works that adequately covered the three indicators of HDI for the year 2015 (Wikipedia,

2016). This investigation examined the relative Human Development Index data obtained from the different countries in the world and compared those of each continent with the human development indexes of each of the other continents in the world. Thus, Human Development Indexes of the seven continents in the world (Africa, Asia, Antarctica, Oceania, Europe, North America, and South America) were quantitatively compared for the establishment of the relative position of each continent and determination of all pair wise comparisons that statistically differ significantly. Authentication of the Human Development Index for each country every in continent can easily be done by anybody via this relevant functional link: https://en.wikipedia.org/wiki/List_of_countries_by_Human_Development_Index. Other links are http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf and <http://hdr.undp.org/sites/default/files/hdr15standaloneoverviewen.pdf>. Keenly interested persons may also wish to know the Human Development Index of countries annually down to 1980 from this link: <http://hdr.undp.org/en/data>.

3.1. Population

The population of this investigation consists of the 253 countries in the seven continents in the world as tabulated.

Table2. *Population of the study*

S/No	Countries	Continents
1	Africa	57
2	Asia	54
3	Europe	50
4	North America	41
5	South America	14
6	Oceania	33
7	Antarctica	4
Total		253

Table3. *Countries in each Continent*

S/No	AFRICA	ASIA	EUROPE	NORTH AMERICA	OCEANIA	SOUTH AMERICA	ANTARCTICA
1.	Algeria	Afghanistan	Albania	Anguilla	American Samoa	Argentina	Bouvet Island
2	Angola	Armenia[2]	Andorra	Antigua and Barbuda	Australia	Bolivia	French Southern Territories
3	Benin	Azerbaijan[2]	Austria	Aruba	Baker Island	Brazil	Heard Island and McDonald Islands
4	Botswana	Bahrain	Belarus	Bahamas	Cook Island	Chile	South Georgia and the South Sandwich Islands
5	Burkina Faso	Bangladesh	Belgium	Barbados	Fiji	Colombia	
6	Burundi	Bhutan	Bosnia and Herzegovina	Belize	French Polynesia	Ecuador	
7	Cameroon	India	Bulgaria	Bermuda	Guam	Falkland Island	
8	Cape Verde	Brunei	Croatia	British Virgin Island	Howland Island	French Guiana	
9	Central African	Cambodia	Czech Republic	Canada	Jarvis Island	Guyana	
10	Chad	China	Denmark	Cayman Island	Johnston Atoll	Paraguay	
11	Comoros	China	Estonia	Clipperton Island	Kingman Reef	Peru	
12	Congo D. R. (Kinshasa)	Christmas Island[4]	Faroe Islands	Costa Rica	Kiribati	Suriname	
13	Congo R (Brazzaville)	Cocos	Finland	Cuba	Marshall Islands	Uruguay	
14	Cote d'Ivoire (Ivory Coast)	Cyprus[2]	France	Dominica	Micronesia	Venezuela	

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15	Djibouti	Georgia[2]	Germany	Dominican Republic	Midway Atoll		
16	Egypt	Hong Kong	Gibraltar	El Salvador	Nauru		
17	Equatorial Guinea	India	Greece	Greenland	New Caledonia		
18	Eritrea	Indonesia	Guernsey	Grenada	New Zealand		
19	Ethiopia	Iran	Hungary	Guadeloupe	Niue		
20	Gabon	Iraq	Iceland	Guatemala	Norfolk Island		
21	Gambia	Israel	Ireland	Haiti	Northern Mariana Islands		
22	Ghana	Japan	The Isle of Man	Honduras	Palau		
23	Papua New Guinea	Jordan	Italy	Jamaica	Palmyra Atoll		
24	Guinea-Bissau	Kazakhstan	Jersey	Martinique	Papua New Guinea		
25	Kenya	Korea, South	Kosovo	Mexico	Pitcairn Islands		
26	Lesotho	Korea, North	Latvia	Montserrat	Samoa		
27	Liberia	Kuwait	Liechtenstein	Navassa Island	Solomon Islands		
28	Libya	Kyrgyzstan	Lithuania	Netherlands Antilles	Tokelau		
29	Madagascar	Laos	Luxembourg	Nicaragua	Tonga		
30	Malawi	Lebanon	Former Yugoslav Republic of Macedonia	Panama	Tuvalu		
31	Mali	Macau	Malta	Puerto Rico	Vanuatu		
32	Mauritania	Malaysia	Moldova	Saint Barthelemy	Wake Island		
33	Mauritius	Maldives	Monaco	Saint Kitts and Nevis	Wallis and Futuna		
34	Mayotte	Mongolia	Montenegro	Saint Lucia			
35	Morocco	Myanmar	Netherlands	Saint Martin			
36	Mozambique	Nepal	Norway	Saint Pierre and Miquelon			
37	Namibia	Oman	Poland	Saint Vincent and the Grenadines			
38	Niger	Pakistan	Portugal	Trinidad and Tobago			
39	Nigeria	Palestinian Territory	Romania	The Turks and Caicos Islands			
40	Reunion	Philippines	Russia[6]	United States			
41	Rwanda	Qatar	San Marino	The United States Virgin Island			
42	Saint Helena	Saudi Arabia	Serbia				
43	Sao Tome and Principe	Singapore	Slovakia				
44	Senegal	Sri Lanka	Slovenia				
45	Seychelles	Syria	Spain				
46	Sierra Leone	Tajikistan	Sweden				
47	Somalia	Thailand	Switzerland				

48	South Africa	Timor-Leste	Ukraine				
49	Sudan	Turkey	United Kingdom				
50	Swaziland	Turkmenistan	Vatican City				
51	Tanzania	United Arab Emirates					
52	Togo	Uzbekistan					
53	Tunisia	Vietnam					
54	Uganda	Yemen					
55	Western Sahara						
56	Zambia						
57	Zimbabwe						
Total	57	54	50	41	33	14	4

Source: Kpolovie, Oshodi, and Iwuchukwu, (2016)

3.2. Sampling Technique and Sample

A large representative sample of 182 which constitutes 71.94% of the entire population of 253 was randomly drawn proportionally with the aid of Table of Random Numbers (Kpolovie, 2017; 2011) from the population for this investigation. The spread of the sample across the continents is as shown in **Tab. 4**.

Table3. Sample drawn for the study

S/No	Countries	Continents
1	Africa	49
2	Asia	47
3	Europe	39
4	North America	23
5	South America	12
6	Oceania	12
7	Antarctica	00
Total		182

3.3. Method of Data Analysis

Data obtained in this investigation were subjected to One-Way Analysis of Variance (ANOVA) with the aid of IBM SPSS Version 24 for testing the null hypothesis at 0.05 level of significance (Kpolovie, 2017). Beyond the ANOVA, Post Hoc Pairwise Multiple Comparisons were executed (Kpolovie, 2007), using Bonferroni for determination of the pair of continents that statistically differ significantly (Kpolovie, 2017; 2012a) in their Life Expectancy at 0.05 alpha (Kpolovie, 2011; 2011b).

4. RESULTS

The research question of “What is the Human Development Index of the different continents in the world?” is answered with descriptive statistics that give the mean and standard deviation of HDI in each continent as shown in Tab 5.

Table5. Descriptive for answering the research question

Descriptives								
HUMAN DEVELOPMENT INDEX								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
AFRICA	49	.5356	.11106	.01587	.5037	.5675	.35	.78
ASIA	47	.7141	.11933	.01741	.6791	.7491	.47	.91
EUROPE	39	.8453	.06313	.01011	.8248	.8657	.69	.94
NORTH AMERICA	23	.7333	.09223	.01923	.6934	.7732	.48	.92
SOUTH AMERICA	12	.7379	.06248	.01804	.6982	.7776	.64	.84
OCEANIA	12	.6926	.13816	.03988	.6048	.7804	.51	.94
Total	182	.6967	.14935	.01107	.6749	.7186	.35	.94

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It can be discerned from Table 5 that Human Development Index in Africa where the N (number of cases or countries) is 49, has a mean of .5356, standard deviation of .11106, .01587 standard error, .5037 lower bound, .5675 upper bound at 95% Confidence interval of means, and .35 and .78 minimum and maximum scores, respectively. Asia with 47 N has a Human development Index mean of .7141 and standard deviation of .11933, standard error of .01741, the lower bound of .6791, the upper bound of .7491, minimum and maximum of .47 and .91 respectively. A similar explanation goes for each of the other continents. Europe with 39 sampled countries has .8453 mean and .06313 standard deviation of HDI. North America with 23 sampled countries has a life expectancy mean of .7333 and standard deviation of .09223. South America with 12 countries has a life expectancy mean of .7379 and standard deviation of .06248. The HDI mean of .6926 and standard deviation of .13816 represent Oceania with 12 sampled countries. Generally, the six continents with 182 countries have a total Human Development Index mean of .6967 and .14935 standard deviations. The total standard error is .01107, the lower bound is .6749, the upper bound is .7186, the minimum is .35 and maximum is .94.

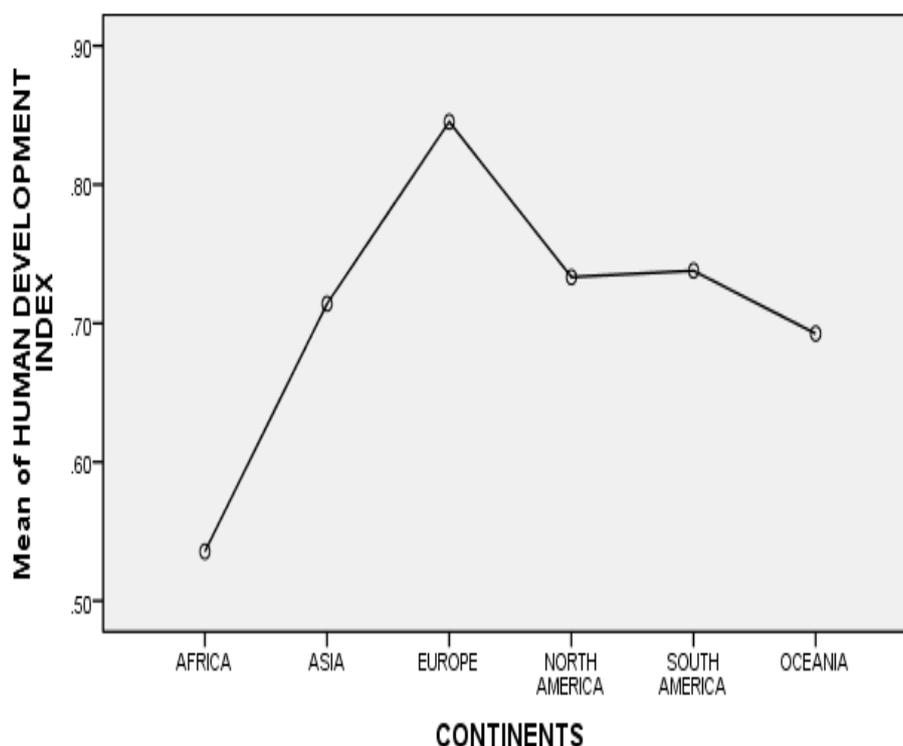


Figure1. Graphical presentation of continental difference in Life Expectancy

The graphical presentation of continental difference in life expectancy as illustrated in Figure 1 has simply revealed that Africa has a mean of .536, Asia has a mean of .714, and Europe has an average of .845. The means of life expectancy for North America, South America, and Oceania are .733, .738 and .693, respectively.

Table6. One-Way ANOVA for testing the Null Hypothesis

ANOVA					
HUMAN DEVELOPMENT INDEX					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.199	5	.440	42.099	.000
Within Groups	1.838	176	.010		
Total	4.037	181			

The ANOVA in Table 6 shows that for between groups, the sum of squares is 2.199, with 5 degrees of freedom, and .440 mean square. For within groups, the sum of squares is 1.838 and the degrees of freedom is 176 with .010 mean square. The total has 4.037 sum of squares and 181 degrees of freedom. The computed F is 42.099, which is statistically significant at 0.05 alpha, and even significant at 0.001 alpha. Therefore, the null hypothesis that “there is no significant difference in the Human Development Index of continents in the world” is rejected; $F(5, 176) = 42.099, p < .05$. In

other words, there is a statistically significant difference in the life expectancy of continents in the world. To ascertain the pairs of continents that significantly differ in their life expectancy, a Post Hoc Multiple Comparison was done as shown in Table 7.

Table 7. Multiple Comparisons of continents' life expectancy, using Bonferroni

Multiple Comparisons						
Dependent Variable: HUMAN DEVELOPMENT INDEX						
Bonferroni						
(I) CONTINENTS	(J) CONTINENTS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
AFRICA	ASIA	-.17856*	.02087	.000	-.2407	-.1165
	EUROPE	-.30971*	.02193	.000	-.3750	-.2444
	NORTH AMERICA	-.19775*	.02583	.000	-.2746	-.1209
	SOUTH AMERICA	-.20237*	.03292	.000	-.3003	-.1044
	OCEANIA	-.15703*	.03292	.000	-.2550	-.0591
ASIA	AFRICA	.17856*	.02087	.000	.1165	.2407
	EUROPE	-.13115*	.02214	.000	-.1970	-.0653
	NORTH AMERICA	-.01920	.02601	1.000	-.0966	.0582
	SOUTH AMERICA	-.02381	.03306	1.000	-.1222	.0746
	OCEANIA	.02152	.03306	1.000	-.0768	.1199
EUROPE	AFRICA	.30971*	.02193	.000	.2444	.3750
	ASIA	.13115*	.02214	.000	.0653	.1970
	NORTH AMERICA	.11195*	.02687	.001	.0320	.1919
	SOUTH AMERICA	.10734*	.03374	.026	.0069	.2077
	OCEANIA	.15267*	.03374	.000	.0523	.2531
NORTH AMERICA	AFRICA	.19775*	.02583	.000	.1209	.2746
	ASIA	.01920	.02601	1.000	-.0582	.0966
	EUROPE	-.11195*	.02687	.001	-.1919	-.0320
	SOUTH AMERICA	-.00461	.03640	1.000	-.1129	.1037
	OCEANIA	.04072	.03640	1.000	-.0676	.1490
SOUTH AMERICA	AFRICA	.20237*	.03292	.000	.1044	.3003
	ASIA	.02381	.03306	1.000	-.0746	.1222
	EUROPE	-.10734*	.03374	.026	-.2077	-.0069
	NORTH AMERICA	.00461	.03640	1.000	-.1037	.1129
	OCEANIA	.04533	.04173	1.000	-.0788	.1695
OCEANIA	AFRICA	.15703*	.03292	.000	.0591	.2550
	ASIA	-.02152	.03306	1.000	-.1199	.0768
	EUROPE	-.15267*	.03374	.000	-.2531	-.0523
	NORTH AMERICA	-.04072	.03640	1.000	-.1490	.0676
	SOUTH AMERICA	-.04533	.04173	1.000	-.1695	.0788

*. The mean difference is significant at the 0.05 level.

The Multiple Comparisons in Table 7 have shown the 30 possible pairwise comparisons of the Human Development Index means across continents in the globe. While there is the significant mean difference in 18 of the pairwise comparisons, 12 of the multiple comparisons do not have a significant difference. Each of the 18 pairwise multiple comparisons that differ significantly at the chosen alpha, 0.05, is marked with an asterisk in Table 7. For instance, the Human Development Index in Africa is significantly lower than the Human Development Index in each of all the other continents in the world. That is, the HDI in Africa (with the mean of .536) is lower significantly than the HDI in Asia (with a mean difference of -.17856); Europe (with -.30971 mean difference); North America (with -.19773 difference in mean); South America (with a mean difference of -.20237); and Oceania (with a -.5703 difference in in mean). Asia has significantly lower HDI than Europe and a significantly higher HDI than Africa on the other hand. Europe has significantly higher Human development Index than each of the other continents (Africa, Asia, North America, Oceania, and South America). Similar explanations apply to the other pairwise comparisons that have an asterisk in Table 7 in favor of the continent with a higher HDI mean. Recall that the descriptive statistics has earlier shown that Human Development Index mean in Africa is .536, in Asia is .714, in Europe is .845, in North America is .733, in South America is .738, and in Oceania is .693. The average Human development Index of all continents in the world is .697.

5. DISCUSSION

Results of the continental comparison of global Human Development Index in the current investigation have shown a significant preponderance of overwhelming evidence that while Europe has the highest Human Development Index, Africa has the lowest Human Development Index of all the continents in the cosmos. The Human Development of every continent world over is significantly greater than that of Africa. The HDI mean of countries in Africa is statistically lower significantly than the mean of Human development Index in the entire world. On the contrary, the Human Development of Europe is higher significantly than the Human development index of each of the other continents worldwide. The HDI mean of European countries is overwhelmingly higher significantly than HDI mean of all countries in the universe.

It conclusively implies authentically that of all continents in the world, Africa has the greatest disregard for provision of means for a long healthy life, access to knowledge and quality education, and decent standard of living (Programmed Aging, 2009; Kirkwood, 2002; 1977; Leigh, 2007; Mackenbach, 2002; Mile, 2016). Life expectancy in Africa is the worst in the world as empirically demonstrated by Kpolovie, Oshodi and Iwuchukwu (2016); and shown by the World Health Organization (WHO, 2010; 2010a; 2015; OECD, 2016). The top 10 causes of death (WHO, 2016; Roser, 2015; Robine & Ritchie, 1991) are much more predominant in Africa than in any of the other continents. The World Bank (2007) World Development Report also indicated the deplorable situation of African countries. A historical examination of Human Development Index from 1980 to date by the United Nations Development Programme have all consistently portrayed that African nations are on the average doing very poorly on all the indicators of HDI (UNDP, 2015c; United Nations Development Programme, 2015). Taking 0.600 as the cutoff point for a globally accepted low Human Development Index (Global Footprint Network, 2015), only Africa has an average HDI of .536 that is even markedly lower than the 0.600 cutoff that depicts poor HDI index.

In each of the reports cited in the above paragraph, European countries performed extremely well vis-à-vis countries in each of the other continents. Taking 0.800 as the cutoff point for a universally accepted high Human Development Index (Global Footprint Network, 2015), only Europe has HDI mean (.845) that is up to and greater than the .800 cut off point. The findings of the current investigation therefore excellently corroborate past works that have compared countries in the world. The present study has gone beyond existing studies to show quantitatively that Africa has significantly worse Human Development Index than each of the other continents in the world; and that Europe has the very best Human development index in comparison with each of the other continents worldwide. Statistically speaking in line with areas of the normal curve, while HDI of Africa falls below $-3Z$, the HDI of Europe falls above $+3Z$ of the normal curve areas (Kpolovie, 2014; 2016; 2017; Herrnstein & Murray, 1994).

In provision of access to knowledge and quality education which is the best means for attaining individual freedom, self-sufficiency, self-actualization, and self-determination that human development index demands, African countries are, on the average, the least while Europe is the best over the past decade (OECD, 2014; 2015, 2016; 2016a; United Nations Development Programme, 2015; 2015a; UNDP, 2015c; Kpolovie, Joe & Okoto, 2014). No person can be said to be genuinely having the freedom to decide what to rightly do and become who he best values to be without first having excellent formal education (Wikipedia, 2016a; Ololube, Kpolovie & Makewa, 2015; Ololube & Kpolovie, 2012; Kpolovie, 2016a; 2014) at great heights (Balchin, 2010; Kpolovie & Obilor, 2014). Early school enrolment, long enough length of time in schooling, and the attainment of a sound first degree at age 25 and master's degree at the age of 28 that serves as education indicator of HDI are worse in African countries in comparison with the countries in other continents. It is extremely difficult for a person without good education to have a secure economic livelihood, peace of mind, self-sufficiency, and self-respect, good standard of living; and this tends to be a common phenomenon in Africa. When education that is an inexorable tool for skills acquisition, self-confidence development, dignity building, status attainment, and horizons broadening of positive possibilities is adversely lacking in Africa, the continent cannot compete favorably with any other continent in the world.

A decent standard of living (reflected in a Gross National Income per capita) that is never guaranteed in African countries (Carnegie, 2002; Infoplease, 2016; Inequality Watch, 2016; Reddy & Pogge, 2007; Pogge, 2007; 2008; Wikipedia, 2016b; 2016c; 2016d; 2016e; World Economic Forum, 2016)

would not let Africa to have Human Development Index that is comparable with those of countries in other continents world-over. The absence of good income as in Africa prominently prevents valuable options and alternatives, and critically limits access to several opportunities, thereby restricting life chances that a good Human Development Index for a people demands. This negative situation is the very opposite of what is obtainable in European countries, and even in countries of other continents. It is therefore not surprising for Africa to be having the Human Development Index that is significantly lower than the average HDI in the universe, and significantly less than the Human Development Index of each of the other continents. In fact, it is Africa alone that has dragged the Global Human Development average to be lower than 0.745 (i.e., $0.714 + 0.845 + 0.733 + 0.738 + 0.693 \div 5$).

A way forward demands that each African country should do everything possible to guarantee good and long healthy life, unlimited access to knowledge and quality education, and a decent standard of living for all its citizenry for the overall improvement of the Human Development Index of Africa. Ideally, the average Human Development Index should be 1.00. On this note, there is much room for improvement in the Human Development Index of every continent to actualize the ideal HDI of 1.00. Each country is therefore charged to fervently improve its Human Development Index by passionately striving at and actually attaining the peak of each of the three indicators of Human Development Index.

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