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Information for Rural Development in Africa

Austine Phiri

Abstract

Information is one of the major contributors to sustainable development in Africa. Access to relevant information would offset the emerging challenges in market supply chains, climate change and shrinking natural resources. At the same time, information can help to reduce poverty and creating economic opportunity for the majority of the rural populace in Africa. Further growth of ICT can enhance lifelong learning and impart skills and knowledge for individual and societal growth. This growth in skills and knowledge would also impact access and use of information in agriculture, health, transportation and economy. Information is very important in business by presenting data in a way that can be interpreted by management and support growth in the industry. Relevant information can support teaching and learning and improve quality sustainable education development in Africa. The chapter proposes that access and use of information in Africa can be enhanced by designing and improving the existing information infrastructures such as the internet and information centres. Legislations such as Access to Information and others would compel African governments and institutions to reconsider the role of information for sustainable development and consequently use it for decision making and competitive advantage.

Keywords: information, knowledge, rural development, sustainable development, Africa

1. Introduction

The dawn of the new millennium has seen many possibilities for growth and development in Africa. Africa is positioned as the centre of trade and growth of the economy by 2050. Growth in the areas of the economy, agriculture, technology, transportation, and education will drive the current and prospects of economic prosperity in Africa. As economic growth in Africa is inevitable, the aspects of sustainable development are of particular concern. As the desire for economic growth improved standards comes into the picture in Africa, there is a need to carefully consider stabilising the natural resources as they are exploited to support growth. Access and use of Information and knowledge in Africa are important to support future economic growth and consequently sustainable development. This chapter will attempt to create a convincing association between access and use of information and knowledge and sustainable development in Africa. The discussion will revolve around sustainable environmental management, sustainable agriculture development, economy, technology, transportation, business and education for sustainable development. The concepts of information and knowledge and

sustainable development have been discussed to offer a context for information for sustainable development in Africa.

The sources of literature for the chapter were journal articles, published and unpublished dissertations, technical and research reports, and archival documents and collections. The sources of literature were accessed from databases such as World Bank, United Nations Development Programme, United Nations Conference on Trade and Development, United Nations Office of the Special Advisor on Africa, Food and Agriculture Organisation, New Partnership for Africa's Development, World Health Organisation, Government Ministers and Departments in Africa. Other sources were from journals such as Information Development, Developing Countries Studies, Journal of the American Planning Association, Chelsea Green, and Development. Other sources for the chapter were accessed from digital repositories such as Mzuzu University and University of Malawi repositories in Malawi, University of South Africa repository and Makerere University repository in South Africa and Uganda respectively. The search terms for the review were Information, Knowledge, rural development, sustainable development, and Africa. The inclusion criteria for information sources was that the information sources have to be peer-reviewed, less than 14 years old, except where the information source(s) was or were important and cannot be replaced with current source(s). The work has to be related to information and sustainable development in Africa and as such the sources reviewed were limited to African countries with a bias to a rural setting. Similar methodologies adopted for the chapter were used in literature review studies on agriculture information in developing countries in Africa by Phiri, Chipeta and Chawinga in 2019, Duta in 2009 [1, 2].

1.1 Concept of information and knowledge

Information and knowledge are highly regarded as the new 'factor of production', with equal contribution to human development as the traditional factors of production – land, labour and capital. It is an open secret and common knowledge in the twenty-first century that information and knowledge is the solution to any society's economic and social problems. Furthermore, information is considered as the most basic human need and a right. Despite the major contribution of information in social and economic development for the developing world, little attention is placed on managing and using such information. It is now a cliché to pronounce that Africa is the most underdeveloped continent in the world, where the majority lacks access to development-oriented information [3]. Trevor Haywood has called this marginalised group that has no access to the world's surplus knowledge, 'the information poor' and another with access to the essential information resources "the information-rich" [4]. There are numerous contributing factors to this sad situation in African and the situation is dire in a rural set-up with limited access to infrastructure and other basic facilities such as information centres, roads, schools, and hospitals. Partly, the cause of the problem is the lack of exposure to the importance of evidence/information which is key to development. This writing will demonstrate the practical contribution of information to sustainable rural socio-economic development in Africa.

Access and use of information resources largely depend on physical and technical connectivity. Rural setup in Africa is largely marginalised in terms of the availability of the physical infrastructures and let alone technical connectivity [5]. Most of the rural areas of the continent have no access to these information resources due to the lack of relevant infrastructures. Therefore, there is an urgent need to construct roads, schools, information centres and internet cafes to enable the rural population to access all types of information that concerns their everyday

lives [5]. Further still, ICT skills (or lack thereof) represent yet another defining characteristic of access to and use of information and technology. Equipping the rural people with skills on means of navigating the web can greatly influence their ability to access and use the information and consequently help others in accessing the information on the internet and other information centres. Therefore, understanding the social dimensions of the society such as poverty, race, age, caste can greatly influence access and use of information for the sustainable social-economic development of Africa. According to the International Federation of Library Associations and Institutions, studying the social context that enables meaningful use of information also reveals the intersectional nature of information use – where the personal dimensions of identity overlap, reinforce, and multiply the resources and barriers of people and communities [6].

1.2 Concept of sustainable development

Sustainable development is the principle for meeting development goals while simultaneously sustaining the ability of natural systems to provide the natural resources and ecosystems on which the economy and society depend. The implication is that system of continuously using the resources to meet the needs of the society without undermining the stability of natural resources. Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The current framework of the United Nations Sustainable Development Goals addresses the issues such as poverty, inequality, climate change, environmental degradation, peace, and justice. Under the framework, United Nations Charter on Millennium Declaration identified principles to achieving global sustainable development such as economic development, social development and environmental protection. The term sustainable development as used by the United Nations incorporates both issues associated with land development and broader issues of human development such as education, public health, and standard of living [7].

Over the years, the concept of sustainable development has developed and the focus has been towards the issues of economic development, social development and environmental protection. Developed economies are striving to streamline their economic development agenda with obligations of protecting natural resources and ecosystems. This also shifts the focus from mere conducting round table commitments towards sustainable development to leveraging the same for economic development. The result is the economic development that recognises the existence and needs for sustaining the environment and ecosystem called Managed Sustainable Development (MSD). In the context of this chapter, the concepts of information and sustainable development will be discussed in the dimensions of four domains: ecology, economics, politics and culture. An attempt for discussion on the close relation of the concept of information and sustainable development in the light of the domains will be exemplified across the chapter.

2. Sustainable development themes and information

2.1 Environmental (or ecological) management

Sustainable development in the realm of the environment (ecology) is the act of creating a co-existence between human settlements and the environment. Therefore, human ecology broadens the focus of sustainable development to include the concept of human health. Human health includes the availability

and quality of air, water, food and shelter are also the ecological foundations for sustainable development [8]. Environmental sustainability concerns the natural environment and how it endures and remains productive. Since natural resources are derived from the environment, the state of air, water, and the climate is of particular concern. The issue of environmental protection is of importance in Africa. According to the Data from Institute for Security Studies summarised in **Figure 1**, Africa's population is the fastest-growing in the world and it is expected to increase by roughly 50 per cent over the next 18 years, growing from 1.2 billion people today to over 1.8 billion in 2035 [9]. It is further predicted that Africa will account for nearly half of global population growth over the next two decades [9]. These statistics are very worrisome and they eventually threaten the environment as the scramble for natural resources such as air, water and minerals will exponentially increase in the next decade. Therefore, environmental sustainability will require society to design activities or processes that address the demanding needs of the population while preserving the planet. This entails using water, renewable energy, and material supplies sustainably [10].

Integral elements for sustainable use of the environment in Africa are research and innovation activities. This eventually generates information and knowledge that inform present and future decision making on environmental protection. Access to information and knowledge at all levels of decision making and systems in the African society can truly create a lasting behavioural change on the human perspective of the environment and the responsibilities therein. Universities and research institutions can lead these activities of generating knowledge for environmental protection. Issues of funding are equally critical in this equation and more resources need to be allocated towards activities that lead to the generation of research data for environment protection. Public libraries and other information centres can support the dissemination and access of environmental information by the public. Many public libraries in African can provide information services beyond their physical location. Many public libraries have mobile libraries services that serve people in rural communities, offering books, services, and internet access. In Namibia, a country with one of the world's lowest rates of population density, mobile libraries travel hundreds of kilometres from the country's regional libraries to loan out books, provide Wi-Fi access, and allow visitors to use a computer and printer [6]. Equally, several initiatives are being done on access to

Figure 1. Population increase forecast in millions, 2017–2035. Source: IFs v 7.26, historical data from US Census Bureau via CIA and United Nations population division (UNPD) 2015.

information that could benefit Africa as far as environmental protection is concerned. The most famous are the projects of Research 4 Life such as AGORA (Access to Global Online Research in Agriculture) and OARE (Online Access to Research in the Environment) with a focus on access to information on sustainable agriculture and environment in developing countries and Africa inclusive [11]. AGORA programme enables least-developed countries to gain access to a digital library collection of 3,500 journals and 3,300 books in the fields of food, agriculture, environmental science and related social sciences [11]. In addition, OARE provides access to information resources in a wide range of disciplines contributing to our understanding of the natural environment, including environmental toxicology and pollution, ecology, geography, environmental economics, environmental law, conservation policy, environmental engineering. The prospects of gaining potential from such huge literature can help support environmental protection initiatives in Africa through the provision of relevant information resources.

2.2 Sustainable agriculture development

Agriculture is the main economic activity for the majority of the rural population in Africa and a major contributor to the Gross Domestic Product index of the continent. According to the statistics in **Table 1** prepared by World Bank, African economies rely heavily on agriculture; for Sub-Saharan Africa, the agriculture sector’s share in GDP was 12.7 per cent in 2009 and employed more than 60 per cent of the labour force [12]. Statistics on trade in Africa are indicated in **Table 1**. Therefore, venturing into sustainable agriculture would greatly support the African population and economy. Elements of sustainable agriculture include permaculture, agroforestry, mixed farming, multiple cropping and crop rotation [13]. It involves agricultural methods that ensure the stability and quality environment for humans for survival.

Access and openness of agriculture information and knowledge can positively contribute to creating lasting awareness among smallholder farmers in Africa on sustainable farming methods that stabilise the natural environment without depleting its natural ingredients. Individuals and communities engaged in the agricultural sector need accurate, timely and reliable information to increase production and improve their living standards [14]. Phiri, Chipeta and Chawinga further argue that a positive relationship exists between agricultural productivity and information access and use of rural smallholder farmers in Africa. Therefore, extension agents have a role to play in disseminating such information to smallholder farmers [14]. Generation and dissemination of such information would help tackle the emerging challenges such as improving efficiency in market supply chains, climate change and shrinking natural resources [3]. A sample of the projects on generating agricultural information for the developing world are Agricultural Learning Repositories

Sector	2005	2006	2007	2008	2009
Agriculture	16.9	16.4	15.4	12.4	12.7
Industry (inc. mining and manufacturing)	31.4	31.9	32.4	32.5	30.6
Manufacturing	13.1	12.6	14.0	13.6	12.9
Services	51.7	51.8	52.3	55.1	56.6

Source: Based on World Bank World Development Indicators 2010 Database.

Table 1.
Trade indicators in Africa.

Task Force – AgLR-TF, AgriLORE, and e-Agriculture community. Agricultural Learning Repositories Task Force – AgLR-TF is run by the Food and Agriculture (FAO) of the United Nations to create a network of organisations that promotes the development of an open and interoperable global infrastructure to facilitate sharing and reuse of learning resources on topics related to agricultural and rural development worldwide. AgriLORE is part of the National Agricultural Innovation Project (NAIP) being implemented by ICAR in India. One of the objectives of the project is to generate, review, manage and publish approved learning materials for wider use and re-use by distance learning institutions and interested rural and community organisations and extension agencies. The e-Agriculture Community is a global community of practice in which people worldwide exchange information, ideas and resources related to the use of ICT for sustainable agriculture and rural development. The essence of the projects is to enhance the generation and use of data and information through ICT for sustainable agricultural development in developing countries such as Africa.

2.3 Economy for sustainable development

Rural poverty strains the environmental resources as the majority of the population scramble for resources for their daily living. Therefore, environmental resources are important economic assets. In the 21st Century, the quality of life largely depends on sustainable use of the environment. According to United Nations Development Programme 2017 Poverty Statistics in Africa, indicated in **Figure 2**, poverty rates range from a high of 74.8 per cent in Niger to a low of 45.3 per cent in Burundi (See **Figure 2**) [15]. Therefore, access to knowledge and information resources would help to mitigate poverty levels in Africa and enhance the economic activities of millions of people on the continent. Poverty and economic standing significantly affect people’s ability to use information meaningfully. At the same time, access does offer an avenue for reducing poverty and creating economic opportunity. Access to information, in its fullest sense, includes the production and sharing of information and multimedia, as well as the creation of physical objects. The use of wireless technology can help access information on the internet through mobile phones and computers. This approach can also help the youth to acquire skills and reduce illiteracy, inequality, ill-health and spur agricultural development in Africa. This can also be seen in outreach programs that target groups such as

Figure 2. Poverty levels in selected African countries. Source: United Nations development Programme, 2019.

workers in the agricultural or small-business sectors to help them improve their yields, find new markets, or increase sales through more effective business practices [6]. In this way, libraries support individuals' growth from passive consumers of agricultural products to active producers.

2.4 Technology for sustainable development

The last decade has witnessed the growth of the ICT sector in Africa and the information economy is becoming one of the main drivers for economic growth in general. For example, according to data in **Figure 3** by the South African Government, South Africa's ICT sector contributed more than 2.9 per cent to the country's gross domestic product (GDP) in 2012. The ICT sector in Tanzania contributed about 20 per cent to the country's GDP in the same while. It is projected that the ICT sector in the continent is growing rapidly with annual revenues estimated at around USD50 billion. One of the core concepts in sustainable development is that technology can be used to assist people to meet their developmental needs. Technology that endeavours to meet these human needs is referred to as appropriate technology. For example, In Burkina Faso, the Girls' Mobile Health Clubs found in four village libraries expand access to quality health information while also providing support to the participants to increase their information literacy and technology skills. In Ghana, the Volta Regional Library mobile library in 2012 to improve educational opportunities for students attending schools with limited resources through the provision of hands-on computer classes [6]. This intervention contributed to an increase of pass rate in ICT among the students to 50 per cent and additional funding for the expansion of the programme to other schools. These initiatives in these countries and other countries not discussed here

Figure 3. South Africa's ICT sector contribution to GDP. Source: Information and communication technology satellite account for South Africa, 2012.

demonstrate the tremendous contribution of ICT to sustainability in various sectors of the economy such as health and education. Therefore, investment and consequential growth of ICT in Africa can improve the lives of the people through life-long learning and access to various information through the infrastructure. Another landmark project with equal significance to the growth of ICT is ARDI (Access to Research for Development and Innovation) launched in 2009 by World Intellectual Property Organisation (WIPO) and partners in the publishing industry [11]. ARDI offers access to scholarly literature from diverse fields of science and technology and also promotes the integration of developing and least developed countries into the global knowledge economy, reinforcing the knowledge infrastructure and supporting researchers in creating and developing new solutions to technical challenges on a local and global level [11]. African countries can exploit these outstanding ICT initiatives and enhance the growth of the sector for sustainable socio-economic development.

2.5 Transportation for sustainable development

Sustainable economic growth and poverty reduction call for the development of all sectors of the economy to meet the needs of the current and future generations. Transport is one of the key sectors that play crucial roles in achieving the goals of poverty eradication and sustainable development. The transport sector in Africa is linked and stimulate developments in other sectors of the economy. Consequently, transportation contributes to the attainment of Millennium Development Goals (MDGs). Sustainable transport has many social and economic benefits that can accelerate local sustainable development. According to a series of reports by the Low Emission Development Strategies Global Partnership (LEDS GP), sustainable transport can help create jobs [16], improve commuter safety through investment in bicycle lanes and pedestrian pathways [17], make access to employment and social opportunities more affordable and efficient. It also offers a practical opportunity to save people's time and household income as well as government budgets [18], investing in sustainable transport a 'win-win' opportunity. World trade, in our increasingly globalised and networked economy, depends on the rapid and timely transportation of goods from manufacturing places to market areas [19]. Despite the positive contribution of the transport services to the sustainable development of Africa, the sector faces numerous challenges such as huge costs of transport systems and accidents and contribution to greenhouse gas emissions.

According to Working Paper no. 72 of March 2018 of Export-Import Bank of India, Africa's transport and insurance costs represent 30 per cent of the total value of exports, which compares unfavourably with 8.6 per cent for all developing countries [20]. The working paper further argues that some African countries incur high transport costs due to their landlocked nature. Accidents associated with the transport sector is huge in Africa. For example, over 225,000, or 19 per cent of 1.2 million people killed in the world were accounted for by deaths on African roads alone. Moreover, Africa has the highest number of road traffic accidents per capita. It is estimated that one-third of all gases produced are due to transportation [21]. Motorised transport also releases exhaust fumes that contain particulate matter which is hazardous to human health and a contributor to climate change [22]. Information can help to facilitate the logistical challenges in Africa as far as transport is concerned. Access and use of information can ensure the efficiency and effectiveness of an organisations operations. Information can help to quickly make decisions about issues of transport in the organisation. Efficiency and effectiveness in decision making can help to reduce delay costs of transporting goods and services by opting for efficient logistical organisations to handle the goods thereby reducing

delays in transportation. Information forms an important ingredient for improving the transport systems in Africa. Having access to the right information by institutions involved in the transport sector can help to reduce the risks of travelling through accidents and others by electing appropriate traffic signs and symbols. Information is equally important in reducing greenhouse gases emissions in Africa. Statistics on the amount of greenhouse may help policy formulation on instituting measures for reducing such emissions through various legislations on car manufacturing and certification.

2.6 Business for sustainable development

Currently, some African countries such as South Africa, Ghana, Mauritius and Tunisia are experiencing exponential growth in their economies [23]. In addition, the World Investment Report data of 2021 in **Figure 4** indicate that Foreign Domestic Investment (FDI) inflows to Africa are equally increasing year-to-year from 19.3 per cent and 3.5 per cent for the Democratic Republic of Congo and Nigeria respectively [24]. Economies in the African region are registering a steady growth attracting foreign investors. Several factors have positively contributed to this trajectory such as democratic and accountable government systems, economic policies, innovative information and communication technologies and the emerging spirit of entrepreneurship. Despite these opportunities, several challenges exist in the continent that impeded the further growth of business ventures. One such challenge is corruption which has serious consequences on the growth of businesses and economic stability. Others include civil unrest, poverty, high-interest rates of borrowing money and underinvestment in information and communication technologies. These challenges, among the others, pose a serious threat to the present and future growth of business and the economy in Africa. Of particular importance in the growth of the business in Africa is the power of data and information. Data and information are the facts and statistics needed for decision making in business and sustainable competitive advantage. It is believed that businesses with the right information on customers, products and others can influence the market potential of the products and grow their business. Therefore, to grow and manage business sustainably in the 21st century, high-quality data and information have to be available at all times at the disposal of the decision-makers. The value of data and information is equally important to the decisions made. This implies data and information on their own are meaningless without action/decision making. The value of data and information in business is equally dependent on actions being taken which may stimulate sustainable business development in Africa.

2.7 Education for sustainable development

According to United Nations Development Programme Report, Africa is the most youthful continent in the world with more than 200 million youth aged 15 to 24 [15]. A robust education system and employment opportunities for the majority of youth is key for economic development and growth in nations across the continent. The education system in African continues to grow with more students being enrolled in various schools. This calls for the huge infrastructure, teaching and learning materials and recruitment of several well-trained and qualified teachers. Students and teachers need access to relevant information resources to support their curricula. Access to relevant information is restricted in Africa due to several factors such as low budget allocation to purchasing teaching and learning information resources such as books and subscriptions to journals. In the 21st century, the internet is the major source of educational information globally but access to the

Figure 4. Africa: FDI flows, top 5 host economies, 2021. Source: UNCTAD, world investment report, 2021.

facility is privileged. The Internet provides access to e-books, electronic journals and other important teaching and learning resources. Internet access by students and teachers in most educational institutions in Africa is compromised either due to lack of ICT infrastructure or the exorbitant cost of internet subscription fees. A positive development is that most African countries are devoting substantial portions of their government budgets to their education sectors, despite often relatively modest GDP's and many other developmental issues. It is a fact that the increase in government spending on education is by far not enough to reach essential education levels and to provide decent education opportunities for their young people. Despite all these problems, positive development and momentum are arising as the African

countries are allocating the largest portion of their governments' expenditure to their education systems reaching as far as 18.5 per cent. It is envisaged that this expenditure will positively impact internet access by students and teachers, thereby, providing avenues for access to relevant information resources for sustainable education development.

3. Conclusion

The discussion has offered arguments that information and knowledge contribute to sustainable development in Africa. Information has the potential to support different sectors of the African economy from environmental management to business growth. Access to information and knowledge in decision making can create a lasting behavioural change in our perspective of the environment. Dissemination of information would help tackle the emerging challenges such as improving efficiency in market supply chains, climate change and shrinking natural resources. In addition, access does offer an avenue for reducing poverty and creating economic opportunity. Investment and consequential growth of ICT can support lifelong learning and access to various information. Access and use of information can support the efficiency and effectiveness of an organisation's transport operations. Information can also help businesses to make informed decisions by presenting data in a way that can be interpreted by management. Access to relevant information resources can support teaching and learning and improve quality sustainable education development in Africa. Designing and improving information infrastructures such as the internet and information centres would facilitate access to information at a low cost in Africa. Improving the skills of information providers through short-term and long-term training would also help users access information easily. Legislations such as Access to Information and others would compel African governments and institutions to reconsider the role of information for sustainable development and consequently use it for decision making and competitive advantage.

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