

## HARNESSING SOCIAL MEDIA AS VIABLE PLATFORMS FOR ENVIRONMENTAL MANAGEMENT IN THE 21<sup>ST</sup> CENTURY

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### ABSTRACT

Environmental problem is currently one of the major global challenges of the 21<sup>st</sup> century. In the past, the three components of the environment- air, soil and water were pure, virgin, undisturbed, uncontaminated and basically most hospitable. Today, the reverse is the case; this is largely due to urbanization and development of science and technology leading to total conquest of the earth by man. The results are soil erosion, flooding, pollution and land degradation among others. In the face of these numerous challenges however, it is discovered that not only the enforcement by government agencies concerned is the problem but also awareness regarding why, when, and how to prevent and manage a particular environmental problem in the immediate environment.

The use of social media platforms at getting information regarding the basic requirements and management of the environment closer to as many people as possible is therefore the central theme of this paper.

The various platforms of social media as well as their characteristics are discussed, and ways by which social media can accelerate environmental management are suggested to enhance environmental management and attain sustainable development.

**Keywords:** Social Media, Networking, Internet, Environmental Management, Sustainability, Sustainable Environment

## **INTRODUCTION**

Environmental problem as currently manifested is one of the major global challenges of the 21<sup>st</sup> century. In the past, the three components of the environment- air, soil and water were pure, virgin, undisturbed, uncontaminated and basically most hospitable. But the reverse is the case today because progress in science and technology is leading to environmental degradation and serious ecological imbalance, which in the long run may prove disastrous for mankind. (Sharma, 2002). Besides, urbanization has greatly modified the nature of the environment leaving many scars on the surface of the earth, ranging from waste generation, flooding and pollution in its different kind such as air, water, land and visual pollution to land degradation.

In Nigeria, like many other developing countries of the world, Man is totally dependent on the environment for his daily needs such as food, shelter and clothing and it is in the bid to acquire these basic needs that he has dealt adversely with the environment. Man is increasingly placing burden on the planet through their daily activities such as agriculture, industries, manufacturing, transportation and housing so much that it has negatively affected the environment thereby causing land degradation, water pollution, and air pollution among others. Besides, the increasing hostility and unhealthy use of the environment is causing dislocation of the ecosystem and depletion and extinction of species of plants and animals.

The concern for environmental management and sustainability therefore a front burner in the list of world programmes and efforts to stem the tide of unacceptable level of environmental degradation have gained more attention globally. The 1972 Stockholm United Nations Conference on Human Development established the nexus between underdevelopment and environmental integrity. Twenty years later, precisely in 1992, the United Nation Conference on Environment and Development also known as the Earth Summit held in Rio de Janeiro, Brazil generated an action plan for sustainable development in the 21<sup>st</sup> century, which forms the policy instrument for programmes on environment in various countries.

In a follow up effort, sustainable environmental management was well captured in the just concluded Millennium Development Goals 2000-2015 and as well, given a prominent place in the Sustainable Development Goals for 2016-2030.

## **SUSTAINABLE DEVELOPMENT**

As a new paradigm brought to the limelight by the World Commission on Environment and Development, and as presented in their 1987 report, *Our Common Future*, Sustainable development is development which “meets the needs of the present without compromising the ability of future generations to meet their own needs”. In this respect, three aspects of sustainable development are recognized (Jonathan, 2000)

**Economic:** An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances which damage agricultural or industrial production.

Social: A socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, and political accountability and participation.

Environmental: An environmentally sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resource systems or environmental sink functions, and depleting non-renewable resources only to the extent that investment is made in adequate substitutes. This includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as economic resources.

Consequently, convening the gospel of environmental related issues such as the types of environmental problems, areas prone to such problems, the vulnerable groups and the causes, prevention and solutions to those problems when occurred, must be speedily achieved to save millions of lives and properties that may be lost in the process. In the face of these numerous challenges however, it is discovered that not only the enforcement by government agencies concerned is the problem but also awareness regarding why, when, and how to prevent and manage a particular environmental problem in the immediate environment.

Harnessing social media platforms at getting information regarding the basic requirements and management of the environment closer to as many people as possible is therefore the central theme of this paper.

## **INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)**

ICT encompasses Technologies for information transfer, management, processing and sharing using computers and telecommunications equipment. It basically includes all activities related to information technology (IT) and telecommunications (telecom). Modern Technology in communication has unarguably turned the entire world into a “Global Village”. It helps people to be better informed, enlightened, and keeping abreast with world developments. The impacts are so pervasive, with so many complementarities as rightly described by (Bresnahan and Trajtenberg 1995). Ericsson (2015) has rightly viewed ICTs as creating an overall societal transformation, the so-called Networked Society. And to say that ICTs have demonstrated the fastest global diffusion in history is an understatement.

The time it has taken for the global public to adopt ICT-based applications, including mobile phones, social networking, e-finance, and other ICT solutions has outstripped previous technologies, and are likely to continue to set records in the future.

In the view of Paul (2012, p.301), internet is a massive “network of networks”, a networking infrastructure which connects millions of computers together globally, forming a network in which any computer can communicate with each other as long as they are both connected to internet. The network consist of Local Area Network (LAN), connecting computers in the same building while Wide Area Network (WANs) connecting several LANs in different locations. It connects both private, commercial, Government and Academic network including a grown number of home computer. These important facilities afford millions of users at different locations the opportunity to share and use information.

## **HISTORY OF THE INTERNET**

There are conflicting versions about the origin of the internet but the common story is that the internet is a product of a cold war. (Hafner and Lyon, 1996, p.116). Its origin is traced back to 1957, when the Soviet Union launched 'Sputnik 1 into space, as a reaction to this, in 1958, the United State founded the Advanced Research Project Agency (ARPA), a special agency under the department of defense whose mission was to develop a long term highly innovative and hazard research projects (Cartoni and Tarding, 2006, p.26).

In 1962, the air force wanting to maintain the military's ability to transfer information around the country even if a given area was destroyed in an enemy's attack, commissioned leading computer scientist to do so. ARPANET, the first prototype of the internet, was developed by the ARPA department and saw the light in 1969 when four (4) of United States Universities (University of California Los Angeles, University of California Santa Barbara, Stanford Research Institute Palo Alto, and University of Utah) were connected by network of computers (Lorenzo and Stefano,2010).

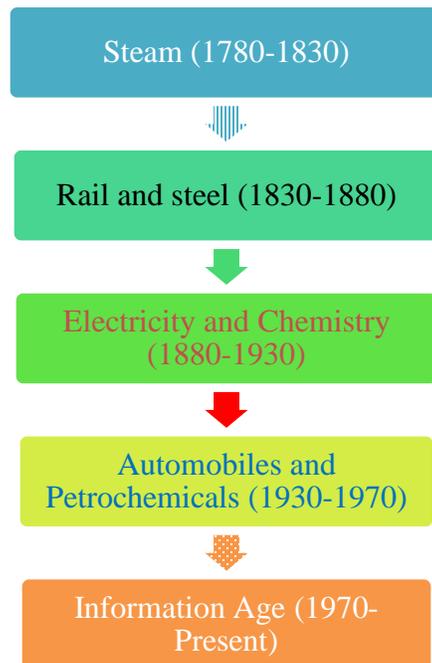
Leonard Klein rock of UCLA successfully developed the first computer network through "packet switching" to the concept of "distributed network", two fundamental concurrent inventions in the field of computer science, packet switching is a process that allows division of messages into packets and sending them to their destination following different routes, once they arrive at their destination, they are all recomposed into the original message. Paul in 1960 developed the concept of distributed network funded by United States Air force at the research and development corporation (RAND) which is aimed at developing a telecommunication network which can stand a nuclear war. (Paul, 1964, p. 220-223).

The growth of ARPANET accelerated in the second half of the 1980s, through computer protocol (Tcp/lp) Transmission control protocol/Internet protocol which was adopted by ARPANET (Vinton, 1969 UCLA) in 1983 and is still the core of internet. 'The transition of Tcp/lp was perhaps the most important event that will take place in the invention of the internet. After the installation of Tcp, the network could branch everyone' (Hafner and Lyon, 1998, p.249).In the same year, after the end of ARPANETs experimental phase, the network was split into two; A civilian network for the computer research community (ARPA internet) and military network (MILNET). In 1980, ARPANET was replaced by NSFANET created by National Science Foundation and in 1990, ARPANET was officially decommissioned and the commercial use of the internet was allowed in 1991, (Berners-Lee, 2000, p.223).

In 1995, the internet was just one networking system among many others such as Usenet, Fido net, Mintel, AT&T, but with advent of the web, the internet became by far the most important networking system. That led to what is now known as internet, a global network of interconnected computers that communicate freely, share and exchange information (Paul, 2012). What is now known as "the information age" by (Wilenius & Kirki 2014) kick started in the 70s and now dictates the global direction. Corroborating the infancy of the internet and ICT, among other technological era since the industrial revolution, Kim, (2004) observed that the younger a person is, the greater the chance that he or she has access to the internet. These

Five technological ages, also known as Kondratieff Waves, are arranged as follows and depicted in figure 1: Steam (1780-1830), Rail and Steel (1830-1880), Electricity and Chemistry (1880-1930), Automobiles and Petrochemicals (1930-1970), and Information (1970-Present). Even though each new wave of technology no doubt, has left an indelible mark in the global economic development, none has shaken the global terrain as the Information Age; nonetheless, many argue that the greatest gains from ICTs are yet to be achieved. It makes easy transfer of information across multiple receivers and as well encourages easy transactions in forms of e-banking, e-commerce and e-finance among others. This transformation with improvement and upgrading will without doubt provide the tools for additional, unprecedented advances in healthcare, education, energy services, agriculture, and environmental management and protection.

**Figure 1. The Five Waves of Technology (Kondratieff waves)**



**Source: Adapted from Wilenius & Kirki (2014)**

## **SOCIAL MEDIA NETWORK**

Since the term “social media” was first introduced in 2004, the rapid changes in technologies and fragmentation into various forms of social media has been beyond belief. This evolution makes defining social media a bit slippery. According to the Merriam Webster dictionary the definition of social media is “forms of electronic communication through which users create online communities to share information, ideas, personal messages, and other content”

They are forms of electronic communication which facilitate interactive base on certain interests. Social media include web and mobile technology. Also, Kaplan and Helen (2010) defined Social Media as a group of internet based application that allows the creation and exchange of user generated content.

The early 1990s witness the formation of chat rooms and bulletin boards as forms of Social Networking of sort; they offered people the opportunity to connect with others and shared issues of interest. In no distant time, dating sites for those looking for partners and class mates were formed. Communication of this kind allows people to connect with people they had known in high school and colleges and enable them to meet others.

Some Television Programmers' had started producing programmers' to air on MySpace in 2005. A competitor to MySpace is facebook which started in about 2004 by Mark Zuckerberg while he was a student at Harvard and grew rapidly in 2007. At first, face book was solely for college and high school students but Mark opened it to the public and like MySpace, it encourages all types of member postings. There are also smaller social networks like 2go, YouTube, and Blackberry BB chat and other several channels for people to have contact.

All these are made easy with the era of Global System of Telecommunication (GSM) and the internet. While this lasts, several millions of people keep harnessing the channels for various communication purposes, and the number of subscribers keeps surging by the day. For instance, the Mobile subscriptions went from a few tens of thousands in 1980 to around 7 billion subscriptions in 2015, while Facebook users went from zero in 2004, the year it was launched, to 1.5 billion users in mid-2015. According to projections by Ericsson (2015), mobile broadband coverage (3G or above) worldwide will go from almost 1 billion subscribers in 2010 to 7.7 billion subscribers in 2020, covering roughly 90 percent of the world's population while Smartphones will go from near-zero subscriptions in 1999 to 6.1 billion subscriptions in 2020.

## **CHARACTERISTICS OF SOCIAL MEDIA**

According to Cohen, (2011) the followings are the characteristics of social media

1. It encompasses wide variety of content formats including text, video, photographs, audio, PDF and PowerPoint. Many social media make use of these options by allowing more than one content alternative.
2. It allows interactions to cross one or more platforms through social sharing, email and feeds.
3. It involves different levels of engagement by participants who can create or comment or on social media networks.
4. It facilitates enhanced speed and breadth of information dissemination.
5. Social media provides for one-to-one, one-to-many and many-to-many communications.
6. It enables communication to take place in real time or asynchronously over time.
7. It is not device selective and therefore, it can take place via a computer, tablets and smartphones once connected to the internet
8. It extends engagement by creating real-time online events, extending online interactions offline, or augmenting live events online.

## **ROLES OF SOCIAL MEDIA NETWORK**

Social networks are increasingly gaining momentum in the world of information and communication. It has without doubt altered the conventional method of news gathering and dissemination, a confirmation of what seems to be paradigm shift from print and broadcast media to the more effective and efficient rave of the moment. Social networking played a pivotal role in information and communication in both developed and the developing world. Technological shift from analogue to digital has immensely changed the way people communicate in society. It has become part and parcel of today's society.

Many teenagers have joined and many more are still joining Social Networking Sites (SNS). Sunitha and Narayan (2010) observe that social networking has become part of the daily life experience for increasing number of people. Lenhart et al, (2007b) note that 85 percent of teens ages 12-17 engage at least occasionally in some form of electronic personal communication, which includes text messaging, sending email or instant messages, or posting comments on social networking sites, while substantial percentage of adults are also found on one social media application or the other.

Recent reports find that youth spend nearly 10 hours per day using some form of technology with socially networked media playing a large role in their daily lives (Rideout, Foehr & Robert 2010).

Explaining how social media works, Neelamalar & Chitra (2009), state that members of social sites can easily form groups (called communities) and share their opinions among themselves through discussions threads, forums and polls. On their research on the impact of social network on Indian youth they found out that 95% of people who are members in one or more social networking sites spend varying amount of time from less than an hour to five hours every day in social networking sites. They also found out that 95% of the youth find the social networking sites as a platform for reconnecting with lost friends, maintaining existing relationships and sharing knowledge, ideas and opinions.

Moreno & Kelb (2012) observed that for adolescents social media sites are an important medium for self-expression, communication with friends and relatives. They further assert that 22% of teenagers log on to their favorite social media sites more than ten times a day. Studies have shown that adolescents often believe social media sites reference to be accurate which may influence their own perception and actions (Moreno & Kelb: 2012)

Sunitha and Narayan (2010) observe that social networking has become part of the daily life experience for an increasing number of people. While so many people rely on the social media as sources of daily news, others derive pleasure in the entertainment gist, movies as well as other numerous activities happening on the sites. Social media networks are also avenue where knowledge on careers, endeavours and other various subjects can be shared and exchanged among members and non-members alike.

## **CATEGORIES OF SOCIAL MEDIA PLATFORMS**

Since the inception of the idea of networking on social media, several platforms have been invented for easy messaging and interaction and still counting.

According to Kaplan and Haenlein (2010) social media is classified into six different classes as follows;

- 1) Collaborative Project (Wikipedia)
- 2) Blogs and Micro blogs (Twitter)
- 3) Content Communities (U – tube)
- 4) Social Networking Site (Face book. 2go, BB chat)
- 5) Virtual Game World (World of war craft)
- 6) Virtual Second World (Second life)

The Technology includes the blogs, picture sharing, music sharing, crowd sourcing, e-mail, instant messaging and voice over. These services could be integrated via social network aggregation platforms.

In general however, some of these platforms are discussed below

1. Twitter: Perhaps the simplest of all social media platforms, Twitter also just happens to be one of the most fun and interesting. It affords the users to post a link, share an image, or even trade thoughts with their favorite celebrity or influencer.
2. Facebook: Considered to be synonymous with “social media” by some, Facebook is the one site where you’re likely to find friends, colleagues, and relatives all floating around. Although Facebook is mainly centered on sharing photos, links, and quick thoughts of a personal nature, individuals can also show their support to brands or organizations by becoming fans.
3. LinkedIn: One of the only mainstream social media sites that is actually geared towards business, LinkedIn is to cyberspace what networking groups once were to local business communities. It’s great for meeting customers, getting in touch with vendors, recruiting new employees, and keeping up with the latest in business or industry news.
4. Xing: Another professional networking and recruitment site, Xing has the global presence and focus that LinkedIn lacks. Although it can be mistaken for a job search portal, the site actually has a number of features and communities that make it easy to develop relationships with suppliers, colleagues and even thought leaders within industry.
5. Renren: Literally translating into “everyone’s website,” Renren is China’s largest social platform. Hugely popular with the younger crowd, it works in a way similar to Facebook, allowing users to share quick thoughts, update their moods, connect with others, and add posts or ideas to a blog-like stream.
6. Google+: This combines the best of Facebook and Twitter into one site – and backing it by the power of the world’s largest search engine, Google has given users a social site that has a little something for everyone. You can add new content; highlight topics with hashtags, and even separate contacts into circles.
7. LinkedIn Pulse: Even though Pulse is technically a part of LinkedIn, it’s big and important enough to deserve its own entry. Serving as something between a blog and “best of” outlet, it’s the perfect medium sharing new ideas and keeping up on the thought leaders in your industry.
8. Snapchat: This surprisingly-addictive app gives you the ability to take a picture, add art and text and then send it to recipients for a set amount of time (after which the photo will delete itself and be removed from the company’s servers).
9. Tumblr: This platform is different from many others in that it essentially hosts microblogs for its users. Individuals and companies, in turn, can fill their blogs with multimedia (like images and short video clips). The fast-paced nature of Tumblr makes it ideal for memes, GIF’s, and other forms of fun or viral content.
10. Pinterest: Serving as a giant virtual idea and inspiration board, Pinterest has made a huge impact on social media in the last few years. It allows people share pictures, creative thoughts, or especially before-and-after pictures of projects that others can pin, save, or duplicate.

11. Twoo: This Belgian social network site is geared for the 25 and under crowd all over the world. Alongside normal social features like posts, updates, and photo sharing, it also boasts online games and chat features that make it popular with younger users who want to stay entertained while connecting with each other.

12. MyMFB: Created as a Muslim alternative to Facebook and previously called MillatFacebook, it aims to connect the faith's 1.5+ billion followers into a single social platform. While that might sound ambitious, it's growing quickly and offers many of the same post, update, and sharing features as the original Facebook, and is already immensely popular in some parts of the world.

13. YouTube: As a video sharing service, YouTube has become so popular that its catalog of billions and billions of videos has become known as "the world's second-largest search engine" in some circles. The site has everything from first-person product reviews to promotional clips and "how-to" instruction on virtually any topic or discipline. Users have the ability to share, rate, and comment on what they see.

14. Instagram: Looking for a quick, convenient connection between the camera feature on smart phone and all social profiles, then Instagram is the answer. Not only does it allow people to share via Twitter, Facebook, and the Instagram website, one can also choose from a variety of photo filters and invite friends to comment on those photos or ideas.

15. Vine: This platform also available as an app, offers users the chance to share and view brief video clips.

16. WhatsApp: This is another social platform that is widely used by people in their millions. The WhatsApp concept is simple: send text-style messages to anyone else using the platform. It can be individual or group. That straightforward idea has already gathered more than 700 million fans, making the app the world's most popular messaging platform.

17. vk.com: Promoting itself as Europe's largest social media site, vk.com is essentially the Russian version of Facebook, with the same kinds of profiles, messaging, and games. Like Facebook, vk.com allows users to enter both personal and professional information about themselves, and to follow or show support for organizations and businesses.

18. Meetup: Meetup is a perfectly-named platform, because it's perfect for organizing local groups around specific interests. There are meetups centered on just about everything, from music to hobbies, and get-togethers are almost always open to newcomers. That makes it perfect for exploring an interest and making new friends at the same time.

19. Secret: This might be the best social media app most people haven't tried. The premise is simple: join into a group of friends (or create your own), and then share an anonymous message. It's great for fun interactions, idea starters, or just finally getting something off your chest.

20. 2go: 2go is a Social Networking Site, chat, and instant messaging (IM) application. It enables users to chat on their mobile phones free. You can meet users and 2go users as friends. Chat rooms on different topics are opened where you can join in the discussion and socialize with others and also, 2go has gateways that enable users chat with friends on Gtalk, Mxit, and face book. (Retrieved October 15<sup>th</sup> 2016) [www.socialmediatoday.com](http://www.socialmediatoday.com)

## **SOCIAL MEDIA AND ENVIRONMENTAL MANAGEMENT**

Social media services like Facebook, Twitter, Google+, and WhatsApp among others can be used to solve many environmental problems if judiciously harnessed. Given its wide and mass passage of information which of course can be

done at convenience, areas susceptible to environmental hazards such as flooding, pollution and host of others can be communicated to large volume of people across the affected areas. While the attention of the inhabitants of the area can be drawn to the danger inherent in such problems, they can also be fed with the necessary solutions and steps to be taken to ameliorate such. Being an interactive mechanism, where responses to posts can be instantly received, the government agencies in charge of such problems can also be quickly reached through social media as against the traditional and time consuming letter writing which in most cases take time to be delivered. As observed by Dimiter and Plamena (2012), social network paradigm can be used to enable individuals and organizations to collaborate in mutually beneficial ways, in all stages of emergency management: mitigation, preparedness, response and recovery.

During the rainy season for instance, when it is found out that there is going to be heavy downpour likely to cause overflowed rivers, in addition to disseminating the information to the public through the radio and TV stations, social media are helpful tools at hand to be adopted by governments at all levels because it already connects people and it is very easy.

People can directly access links to online information via a number of platforms including websites, mobile friendly sites, smartphone apps and video sharing sites as well as social networking sites. Once a handful of the people get the messages, they quickly forward to those on their site and the messages go viral. This allows for swift response to environmental problems by both the government and the people.

A study by the American Red Cross shows more people are connected to sites like Facebook and Twitter to learn about emergencies, get information and check on friends and family (Gorey, 2011).

It has also been found out by Badger, (2011) that citizens use social media technology in four primary ways during natural disasters

1. Family and Friends Communication - To connect with family members between affected and unaffected communities/areas (or within affected communities) for situation updates and planning responses. This is the most popular use. Primary tools used are Twitter, WhatsApp, Facebook and/or a blog.
2. Situation Updates - Neighbours and communities share critical information between each other such as; road closures, power outages, fires, accidents and other related damages.
3. Situational/Supplemental Awareness - in a number of cases citizens rely less and less on authority communication, especially through traditional channels (television, radio, phone.)
4. Services Access Assistance - Citizens would use social media channels to provide each other with ways and means to contact different services they may need after a crisis.

## **HOW SOCIAL MEDIA CAN ACCELERATE ENVIRONMENTAL MANAGEMENT IN NIGERIA**

Given the numerous roles played by social media in communication and information sharing and exchange through arrays of platforms as earlier discussed, and the large number of people connected to various social media platforms, the power of social media in the management of environmental problems in Nigeria can never be over emphasized. There is therefore the need by the government at all levels to make provision for the followings:

1. Increase in Broadband connectivity of all public and private facilities: This will afford all and sundry access to uninterrupted internet connectivity thereby enabling people to post and receive information regarding “what, where, how, and why” of environmental problems in a particular area.
2. ICT training of all relevant public officials and service providers: Reporting information to the public requires a lot of professionalism and ethical principles most of which the public lack, governments at all levels may therefore have to engage in a train the trainee exercise to guide the public on how to report cases in order not to jeopardise public interest.
3. Deployment of the Internet of Things (remote sensing and control of connected devices) for the public infrastructure and environmental management
4. Launching of environmental related interactive applications that can be dedicated for environmental management purposes. This can be done by various ministries and government agencies that have business with the environment generally.
5. Partnership with service providers including bloggers with the sole aim of incorporating programmes of government that are related to environmental issue into their services. This will enhance quality and up to date release, management and administration of posting and sharing of information.
6. Improvement in power generation and harnessing alternative power supply such as solar power generation: Most of the devices used for transmitting and management of both online and offline information need to be powered steadily to ensure all time connection, as such, there should be regular supply of power to enhance better performance.

## **CONCLUSION**

It is no longer news that the world has become a “Global Village”. This is as a result of paradigm shift in technology and innovation. Internet and Social media have completely altered our ways of communication in the modern world. Millions of people can now be connected together using the internet and social networking sites through different platforms: Facebook, Twitter and WhatsApp among others. Its efficiency and effectiveness in sharing information with large volume of people cannot be over emphasised.

Therefore, with several number of people connected to the internet and ability to interact on various platforms of social media, it is pertinent to harness the power of social networking sites to exchange valuable information on environmental issues with friends, family, neighbours and government ministries, agencies and parastatals.

Environmental problems such as flood, pollution and erosion and land degradation among others can be prevented, controlled and mitigated through exchange of early information with the appropriate authorities through post, photos and sharing of stories. Social Media has become a valuable means of communication in these respects.

Furthermore, while the people can utilize these platforms to reach authorities, the latter can also use the same platforms to educate the populace on what steps to take to avert a particular environmental problem in an area. This will substantially increase the ability to prepare for, respond to, and recover from events that threaten lives and properties.

Consequently, the time is now, to begin to deploy these innovative technologies while developing strategic principles for their effectiveness and the accuracy of information they provide in the bid to attain Sustainable Development Goals in Nigeria and the world at large.

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