

Thomas Berry's Idea of Technological Transformation

*Its Relevance to the Management of Oil Technology in Nigeria's
Niger Delta*

Mark Omorovie Ikeke

Department of Religious Studies and Philosophy

Delta State University, Nigeria

Ikeke7@yahoo.com

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thoughtandpractice@gmail.com

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Abstract

Nigeria's Niger Delta, which produces the oil and gas that have made the country the twelfth largest oil producer in the world, has suffered from environmental degradation caused by oil and gas exploration involving the use of technologies that are very often applied without consideration for the health and well-being of the entire ecosphere. This paper argues that the ideas of the eco-philosopher, Thomas Berry, on technological transformation can be helpful in mitigating such damage in the Niger Delta. The paper concludes that oil technology is not essentially undesirable, but can actually be used to positively transform the Niger Delta. The paper contributes to efforts at promoting ecological conservation.

Key Words

Thomas Berry, Technology, Oil, Niger Delta, environment, philosophy

Introduction

Technology is a neutral instrument: its uses determine whether it is good or evil. For instance, the compass by itself is neutral, but when used to "discover" new lands for conquest and plunder, the use becomes evil. In *Technology as the Root of All Evil*, Emeagwali (2008) suggests that it is through the use of a technological instrument - the compass - that Africa was oppressed, and contends that the continent's continuous lack of substantial technological knowledge can cause it to be subjected to further manipulation. This observation is relevant to the crisis arising from the manner in which oil and gas exploration is carried out in Nigeria's Niger Delta. Nigeria is the twelfth largest oil producer in the world, with more than 80% of its national income from oil revenue. Nevertheless, the exploration for oil has also caused extensive harm to the peoples and environment of the Niger Delta.

The philosopher wonders why things are the way they are. In a word, "... philosophy seeks answers to the foundational questions that are then assumed in other areas of inquiry" (Clark, Lints and Smith 2004, 69). It is concerned with the "whatness" and "whyness" of reality, and not with simply stating that reality is. Eco-philosophy is the application of the critical tools of rationality to the human-earth relation. It is critical thinking on the value of the earth and the place and responsibilities of humans on it.

The use of technology in nature by human beings is a subject of enquiry in both philosophy of technology and eco-philosophy. In his article, "Definitions of technology", Li-Hua (2013, 19) cites various definitions of technology. He cites Karatsu who defines technology as "the combination of human understanding of natural laws and phenomena accumulated since ancient times to make things that fulfil our needs and desires or that performs certain functions". For Miles as cited by Li-Hua (2013, 19), it is "the means by which we apply our understanding of the natural world to the solution of practical problems". According to Maskus as cited by Li-Hua (2013, 19), technology is "the information necessary to achieve a certain production outcome from a particular mean of combining or processing selected inputs." Tersely, technology is the application of human knowledge to the production of goods and services for human welfare. All that humans have discovered to improve their existence on earth are a form of technology. Technology could be material or immaterial. In its material forms it includes tools, instruments, facilities, structures, and all tangible elements that human persons use. In its immaterial form it involves ideas, ideals, mental processes, and words that inform the making of material culture. Nevertheless, due to the environmental crisis, it is now necessary to speak of technology for the benefit of the entire earth. According to the *McGraw-Hill Science and Technology Encyclopaedia* (2005), human tools and techniques that constitute technology ought to enhance the human-earth relationship.

Using insights from the ecophilosopher Thomas Berry, this paper argues that oil technology in the Niger Delta of Nigeria ought to be designed with the protection and development of the people and the environment in mind. It further urges that it will not be enough to adopt technology that remediates environmental harm; instead, environmental harm ought to be prevented as much as possible. In addition, the paper contends that while technology has its negative effects, it can also be transformed and renewed to protect the environment, and to bring social and economic benefits to the people. This being so, a total eradication of technology is not needed, but its ethical use is imperative.

We set out with an examination of the context and content of Thomas Berry's views on technology. This is followed by reflections on the use of oil technology in the Niger Delta. The relevance of Berry's eco-philosophy to the Niger Delta is then appraised.

Technology in Berry's Thought

How technology can help to protect the Niger Delta environment is a pertinent issue. Thomas Berry offers guidelines that are worth reflecting upon in this regard. It is imperative then to ask, who is Thomas Berry? What informed his ecophilosophical thought? What prescriptions did he offer for the healing of the earth? Does his ecophilosophical views on technology have any relevance to Nigeria's Niger Delta which has suffered from the unsustainable implementation of oil and gas technology? In our examination of Berry's views on technology, our focus will be on his chapter on "Technology and the Healing of the Earth", which is contained in *The Dream of the Earth* (1988), because it is in that chapter that he dwells extensively on the impact of technology on the earth.

With regard to the life and times of Thomas Berry, the short biography given here is adapted from two sources (Tucker 2009; Berry 2007). Thomas Berry was born in Greensboro, North Carolina in the United States of America on 9th November 1914, and died on 1st June 2009 in a retirement home in his birthplace. He spent his early childhood in the place of his birth, and also spent some of his later life there. He entered the Roman Catholic Passionate Order in high school, and was later ordained into the catholic priesthood. Berry, though initially named William Nathan after his father, became known as Thomas, the name he took for his profession into the religious life because of his admiration of the great catholic medieval philosopher and theologian Thomas Aquinas. Berry studied European Intellectual History at the Catholic University of America, Washington DC, producing his doctoral dissertation on Giambattista Vico. Berry was an avid historian of culture (Tucker 2009; Berry 2007).

Berry was director of the Riverdale Center for Religious Research for more than twenty years. He taught at St. John's University, New York, Fordham University, New York, and Seton Hall, New Jersey. The books that he wrote reveal his unalloyed love for the earth. Among his numerous books are *The Dream of the Earth* (1988), *The Great Work: Our Way into the Future* (1999), *Evening Thoughts: Reflections on Earth as Sacred Community* (2006), *The Sacred Universe: Earth, Spirituality, and Religion in the Twenty-First Century* (2009), and his 2009 work, *The Christian Future and the Fate of the Earth* (see Tucker 2009). There is no doubt that Berry's membership of the Passionist Order informed his philosophical thoughts on human relationship with the earth. The Passionist Order, like most other religious orders in the Roman Catholic Church, commits itself to a life of evangelical poverty. Members are not allowed to own land. The community can only own the house and land attached to it that its members use collectively. The members of the order rely on their own labour and on contributions from people to sustain themselves. They are simple in their dressing and manner of life. This emphasis on the need for humans to live humbly and simply on the earth informed Berry's "ecothoughts". His enormous scholarly contributions to saving the earth from degradation have earned him various titles such as cultural historian,

ecoth theologian, eco-philosopher, cosmologist, geologist, and earth scholar (Tucker 2009; Ockham 2013).

Berry's central concern is the human-earth relationship. According to him, the presence of humans through much of history has been hostile and damaging to the earth and its life forms:

Our ultimate failure as humans is to become not a crowning glory of the earth, but the instrument of its degradation. We have contaminated the air, the water, the soil; we have dammed the rivers, cut down the rain forests, destroyed animal habitat on an extensive scale, we have driven the great blue whale and a multitude of animals almost to extinction. We have caused the land to be eroded, the rain to be acid. We have killed ten thousand lakes as habitat for fish (Berry 1988, 50)

When Berry asserts that humanity has devastated the earth, there is no gainsaying the fact that he sees this as having been done through the use of science and technology. It is through science and technology that the rivers have been dammed, deforestation has taken place, endangered species have been destroyed, and the biosphere and ecosphere have been polluted with chemicals and poisonous gasses. This is not to say that every form and shade of environmental degradation is as a result of technology. There are many ways that humans degrade the earth that do not involve massive or high technology.

Technology has a role to play in drastically improving human well-being, but it should be utilised without damaging the earth. According to Berry, our future should not be created by polluting the air we breathe, the water we drink, and the soil on which our food is grown. He does not deny the benefits of technology:

This critical view of the technological age admittedly does not adequately recognize the gains in human knowledge and the mitigation or elimination of many human miseries achieved by our new sciences and technologies. While weighing these benefits, however, we must inquire into the new, and perhaps greater and more universal, difficulties we are causing (Berry 1988, 51).

According to Berry, there is need to pay closer attention to the devastation caused by science and technology:

Until recently we have never reflected in depth upon the larger consequences of our industrial processes or their real meaning. Some made fortunes, others obtained jobs. For all of us, these modern developments provided an expansion of life and understanding, although this enlargement often went with the extinction of basic human sensitivities and the loss of contact with the world of natural forces, its spontaneities, and the expansion of the mental and emotional life it offers us (Berry 1988, 51).

Berry was deeply concerned about the fact that industrial agriculture and the industrial system have put tremendous stress on the earth. Citing Rachel Carson's book, *Silent Spring* (1962), he criticises the chemical poisoning of the North American continent. He notes that "chemical engineering was central to all the basic technologies of that period. It was deadly" (Berry 1988, 54). In an interview with Caroline Webb, he states:

We have been caught up in a mechanistic world, because what we make makes us. We are now in weird dream world of industrial technological imagination. Who would be so destructive to the very basis out of which we exist, that we spoil our water and our air? For what? To invent an industrial economy. We are so brilliant scientifically and so absurd in any other way. We are into a deep cultural pathology-in other language, we are crazy. To think that we can have a viable human economy by destroying the Earth is absurd (cited in Webb 2002, question 2).

Berry categorizes the responses to the devastation caused by chemical engineering and other technological forms into four, namely, the new entrepreneurs' method, the humanistic viewpoint, the integrity of nature movement, and the healing of the earth paradigm.

According to Berry, those who belong to the group of new entrepreneurs have so much faith in human progress through scientific industrial processes that they have no sensitivity to what is happening to the earth:

This group has almost no sensitivity to the degradation of the earth that has been taking place in the twentieth century, especially in the postwar years when chemical engineering, electronic and nuclear engineering, aeronautical and space engineering and agricultural engineering took control of the North American continent ... Benefits, surely, in abundance: inventions, jobs, washing machines, refrigerators, telephones, travel, education, entertainment, and the shaping of an industrial world. This group seems devoid of any appreciation of the disturbance caused by brash human intrusion into the ecosystems of nature that was evolved with such care over some hundreds of millions of years (Berry 1988, 54-55).

Berry cites Julian Simon and the late Herman Kahn who claim that the crisis is over exaggerated. They propose that in the face of challenges we should press on with more development and technological inventions. The new entrepreneurs either do not care that they are poisoning the environment, or they simply do not understand the consequences of what they are doing (Berry 1988, 55).

The second response to the technological-environmental crisis is the humanistic critique of technology. One of such critiques is Jacques Ellul's *Technological Society* (1964), which "outlines the invasion of the technocratic process into every phase of human life, the

imposition of a technosphere on the biosphere, and even on the psychosphere, with its progressive devitalization and dehumanization of life" (Berry 1988, 59). Another author that Berry cites is Theodore Roszak, who in *The Making of Counter-Culture* (1969), argues that the youth revolt of the 1960s had an aspect of opposition to technology. Roszak argued in *Person/Planet* (1978) that technology is moving towards a more harmonious human-earth relationship. Berry also mentions Ivan Illich who gives a stinging critique of technology and science in his various writings on the medical profession, education, energy production, etc. Berry notes that the critique of technology comes from various segments of society including the socialist movements, labour movements, and religious groups such as catholic popes. They rail against the injustice in the production process and the inequities in the distribution of the burdens and benefits of the production-manufacturing process. Nevertheless, Berry is of the opinion that none of these critics seems to be concerned with the consequences of the industrial plundering of the natural world (Berry 1988, 59).

The third approach to the unsatisfactory human-earth relationship comes from those who criticise the way in which technology disturbs the natural ecosystems. According to this group, there is need to move from anthropocentrism because when only human interest is considered, the result is harm to the natural world. Consequently, it contends that humanity needs to move away from a conquering attitude to a more evocative one in its relations with nature (Berry 1988, 60). There are traditions of intimate human relations with the earth in the lives of Henry Thoreau (1817-1862) and John Muir (1838-1914). Both lived in natural surroundings and were friendly with nature. Speaking of the American continent, Berry notes that from the World War II era, the world has witnessed industrial ascendancy, advance in chemical, agricultural, automotive, construction, electronic, military and space industries. Through all these the resources of the earth continue to be exploited, upset, and destroyed. More industries mean more deforestation, more desertification, more climate change, etc (Berry 1988, 60). The post-war years is also a period that has witnessed growth in ecological consciousness which has come in the form of the 1968 Club of Rome report, the rise of Greenpeace and Earth First, the works of Biologists Anne and Paul Ehrlich, the birth of Deep Ecology, the approval of the World Charter on Nature by the United Nations, etc.

The fourth response to the unhealthy human-earth relationship calls for the healing of the earth. Berry notes that "They [Edward Schumacher, Wes Jackson, John and Nancy Jack Todd, Robert Rodale and others] wish to provide functional models of human-nature relations that could remedy or at least modify our current dysfunctional industrial patterns.

The most effective of these models are functioning with regard to food production, energy, housing, architecture, craft skills, waste disposal, sanitation, health maintenance, and forestry” (Berry 1988, 62). To give two examples, the group advocates for improved food technology that is earth-friendly, and for cars that cause less damage to the atmosphere. The group therefore does not totally condemn technology, but rather calls for its improvement.

In the light of human hostility to the earth, Berry advocates for a new human future which he calls the ecozoic era. This era will be one of conservation of the earth and the universe from despoliation and degradation. He acknowledges that the critique of technology needs to be tempered, as he concedes that “some beginnings have been made to lessen the pollution, to neutralize toxic or hazardous wastes, or to contain the wastes until they lose their potency” (Berry 1988, 56). In outlining an agenda for an ecological age, Berry prescribes the following seven criteria:

(1) “human technologies should function in an integral relation with earth technologies, not in a despotic or disturbing manner or under the metaphor of conquest, but rather in an evocative manner.”

(2) “we must be clear concerning the order of magnitude of the changes that are needed ... the industrial age has so alienated and so conditioned humans that survival outside the industrial bubble is difficult. Yet we must learn survival in more intimate relations with the natural world ...”

(3) “sustainable progress must be progress for the entire earth community. For humans to advance by eliminating, degrading, or poisoning other life systems is not only to diminish the grandeur of earthly existence, but also to diminish the chances for human survival in any acceptable mode of fulfilment.”

(4) “our technologies need to be integral. They need to take care of their waste products. Waste disposal should be associated with the process, either the immediate process or a related process.”

(5) “there is need for a functional cosmology, a cosmology that will provide the mystique needed for this integral earth-human presence ... what we need is a sense of reverence such as we find with the great naturalists ...”

(6) “nature is violent as well as benign. Our technologies have a defensive role to play.”

(7) "Our new and healing technologies need to function within a bioregional context, not simply on a national or global scale" (Berry 1988, 65-67).

Thus for Berry, technology should move beyond being humanized to being ecocentric. He does not in any way propose that we should not make use of the earth's resources. Caroline Webb, in an interview with him, asks, "Some critics of ecological philosophy say that we are advocating that we go back to a pre-industrial stage. Are you saying it is not a technological future?" Berry replies thus:

No. It is a technological future - but with a difference from how we are doing things today. We can never go back to being pre-industrial. But we can think of being post-industrial. The way to look at it is to have human technologies that are coherent with Earth technologies. It is the coherence-that is, the proper interplay and their mutual interaction-that fosters both the natural systems and human systems. We need to work out patterns of interaction where the human and the natural world interact creatively. We need a mutually beneficial mode of human presence on the planet Earth. For instance, we should improve the fertility of the land rather than dis-improve it by exploiting it. That is the criminal aspect of our whole chemical cultivation of the soil (Webb 2002, question 8).

It is crucial to re-invent human innovations such as oil and gas technologies and to ethically re-define their purposes, thereby helping to create a sustainable planetary society. It is in the light of this that the issue of oil and gas technology in the Niger Delta is next examined.

Technology in Nigeria's Niger Delta

The Niger Delta can be described in terms of politics, economy, social life, ecology, culture, geography, etc. In terms of geography, it is the area covered by the natural delta of the River Niger as it empties into the Atlantic Ocean. Nigeria's government documents speak of a political Niger Delta which includes Delta, Rivers, Ondo, Edo, Cross Rivers, Abia, Imo, Bayelsa, and Akwa Ibom. This region situated "in the southern part of Nigeria and bordered to the south by the Atlantic Ocean and to the East by Cameroon occupies a surface area of about 112,110 square kilometres" (Federal Republic of Nigeria 2006, 49). The Niger Delta is the largest wetland in Africa and the third in the world. It is endowed with a rich ecosystem and biodiversity. It is made up of six or nine oil producing states in South-South Nigeria, depending on one's definition. In the process of prospecting for oil and gas wealth in the Niger Delta, oil multinationals have degraded its environment, resulting in ecological problems in the region.

The fact that technology has brought some good to the Niger Delta cannot be gainsaid. With medical technology in hospitals in the region, infant mortality and maternal death at child birth have reduced. Furthermore, educational technology has improved the processes of teaching and learning in the region's schools. Technologies have also enabled the construction of good roads, bridges, water purification facilities, and telecommunications, among others.

However, we cannot gloss over the evils that the misuse and misapplication of technology have also brought to the Niger Delta. There is no doubt that very often when people hear of the Niger Delta, their minds go to ethnic militancy or oil politics, without reference to the issue of technology. The problem very often is that much of the oil and gas wealth is looted by corrupt and inept politicians who use it to build themselves foreign estates and industries, while the benefits that accrue to the mass of the population come in trickles.

In *Environmental Impact of Natural Resources Exploitation in Nigeria and the Way Forward*, Gutti, Aji and Magaji (2012) argue that oil exploration, which involves a series of mining procedures, often damages the environment. Petroleum exploration causes oil spills, extensive deforestation, loss of farmlands, loss of soil fertility, effluent discharge, and the pollution of rivers and streams. The point is that these negative effects come from poor maintenance of oil facilities or neglect of ethical principles in the process of prospecting for oil. No wonder Gutti, Aji and Magaji (2012, 101) affirm further that "The oil and gas sector should ensure the integrity of their pipelines; follow the guideline policy of gas flaring and in times of oil spillage the best industrial technology employed to effect remediation." It is interesting to note that when recently there was a massive oil spill in the Gulf of Mexico, there was a heavy public outcry in the United States. Not too long ago the company responsible was made to pay billions of dollars (Monaghan 2013). It is regrettable that in Nigeria, oil companies do not follow the best international standards. Even when there are massive oil spills, the oil companies are hardly held accountable. In Nigeria's Niger Delta, oil companies can cause massive damage to human lives and the natural environment and get away with it. Global corporations, extractive industries and the petroleum economy have done extensive damage to the lives of people and the environment. Here it is worth recalling insights from another important work of Berry's, *The Great Work* (1999), in which he argues that corporations have ambivalent commitments and have devastated the planet because of their dominant profit motive, which needs "to be replaced with dominant concern for the integral life community" (Berry 1999, 118). He asserts:

To seek benefit for humans by devastating the planet is not an acceptable project. The ruin brought on this planet over the last two centuries causes a certain foreboding concerning the possibility of the corporation, as we have known it in the past, reforming itself so that it will be a support rather than an obstacle in achieving a viable future. Yet this is the challenge that is before us. We will change or we will die in a major part of our inner being (Berry 1999, 118).

While attacking the extreme focus on profit that characterises corporations, Berry does not forget to interrogate the extractive petroleum industry. He views the extractive economy as a terminal one, producing many contaminants that pollute the environment (Berry 1999, 138). Berry argues further that:

As we seek the far reaching adjustments needed for a more viable way of life, we are now finding that we are now so conditioned by our dependence on petroleum and its benefits that we can hardly imagine life without these benefits. To discover how we will move from a non-unsustainable petroleum-based economy into some alternative form of sustainable economy is the problem. Just now, in this transition period into the twenty-first century, no comprehensive program seems to be available. Our efforts in every field of human activity, in economics, social structures, legal enactments, education, scientific research, in spiritual and religious life all need to be directed towards this restructuring of human life in a more integral relationship with the planet. This relationship will enable us to survive in a state of well-being in the post-petroleum period (Berry 1999, 151).

It is noteworthy that in this present age when there are technologies to drastically reduce or eradicate gas flaring, Nigeria still flares gas into the open ecosphere:

Nigeria ... flares more natural gas associated with oil exploration than any other country in the world and it releases toxic components into the atmosphere and contribute to climate change. Gas flares have potentially harmful effects on the environment, health and livelihood of communities as they release a variety of harmful and poisonous chemicals including nitrogen dioxides, sulphur dioxide, and volatile organic compound such as benzene, toluene, xylene and hydrogen sulphide as well as carcinogens like benzopyrene and dioxin which can cause health complications (Gutti, Aji and Magaji 2012, 100).

Furthermore, "oil spills in Nigeria occur due to a number of causes that include corrosion of pipelines and storage tanks, sabotage, and accidents in oil production operations" (Emoyan, Akpoborie and Akporhonor 2008, 31). The impact of technology on the Niger Delta cannot be overstated. As Tiles (2013, 236) has noted, mining often is "locally unsustainable, exploitative and hugely disruptive of the natural and social environments in which it begins to operate. Mineral deposits occur in limited quantities that will sooner or later be exhausted and the extraction of which becomes increasingly uneconomic."

Before the discovery of oil in 1959 in Oloibiri in Nigeria's Niger Delta, apart from local skirmishes between ethnic groups and the ravages caused by colonial British merchants, the people of the Niger Delta enjoyed some measure of peace and lived in harmony with their environment (Ekuerhare 2007, 556-557). The discovery of oil has brought much suffering to the Niger Delta. The present deputy governor of Delta State in the Niger Delta narrates his personal experience thus: In 1956 there was a great influx of foreign workers into the serene and peaceful environment of Otu Jeremi. They came cutting down forest and cutting through farmlands and plantations. Then seismographic activities followed in the search for oil. There was promise in the air that oil will bring many benefits. In 1988, three decades later many have been displaced from their occupations and the community is without public water system, roads remain un-tarred and people's rooftops are darkened with carbons (Utuama 2009, 9). That the discovery of oil and the oil technology that came with it has caused serious and at times irreversible damage to the Niger Delta is not in doubt. In a word, "The Niger Delta has witnessed a heavy disregard for environment by the oil multinationals for over four decades. This has translated to severe oil pollution, which has affected the atmosphere, soil fertility, waterways and mangroves, wildlife, plant life and human health in general" (Ojakorotu 2010, 46-47).

The Relevance of Berry's Thought to the Environmental Crisis in the Niger Delta

As we earlier noted, Berry holds that technology has some desirable results, but they are often overshadowed by the extensive destruction that it has caused. We also earlier pointed out that according to Berry there are various shades of response to the crisis arising from technological innovations, namely, the new entrepreneur's method, the humanistic viewpoint, the integrity of nature movement, and the healing of the earth. The first believes in unlimited human progress through technology; the second criticises technology without attending to its negative eco-consequences; the third response is attentive to the devastation caused on nature by technology; the fourth calls for a healthy and ecologically appropriate technology. These responses could be roughly merged into two groups, namely, technological optimists (technocentrists), and technological transformers (eco-centrists). The first group described by Berry can be classified as technocentric. The second, while affirming technology, is critical of it, but it is not ecocentric. The third and the fourth are ecocentric. Yet as O'Riordan (1999, 33)

has noted, "we should avoid the temptation to divide the world neatly into an ecocentric camp ... and technocentric camp ... In real life the boundaries are much more blurred."

The group that glorifies technology is rooted in a Baconian worldview that sees the human mandate as one of conquering and dominating the earth (Briggle 2009, 305). This group, as classified by Carl Mitcham, is based on an "engineering philosophy of technology" mindset that sees technology as central to human life (Briggle 2009, 306). Persons who belong to this group which glorifies technology and is optimistic about its prospects include Ernst Kapp, Friedrich Dessauer, Julian Simon, and Francis Fukuyama. To be included in this group also are Adrian Berry and Steve Austin. The other group sees some good in technology, but is critical of the damage that it has caused. This group does not write off technology, but calls for its transformation. From an ecocentric perspective which moves beyond a humanistic viewpoint, human technologies should be designed in such a way that they function in line with earth technologies and natural processes. Technology should work to ensure a harmonious human relationship with nature. This group has romantic influences from Ralph Waldo Emerson and Henry David Thoreau as its basis (Briggle 2009).

The technocentric viewpoint has an obvious shortcoming. Human persons are citizens of the biotic community (Leopold 1949). Human life depends totally on the earth and its natural processes. Achieving the Millennium Development Goals depends on a healthy environment (Maathai 2009, 239-240). Harm that is done to the earth ultimately affects human beings. Technology should not be seen as an end in itself. We are not called to make a choice between the environment and development; rather, what is needed is a balance (Maathai 2010, 250). Technology should be designed to respond to the need for sustainability (Orr 1992). In addition, humans ought to make lifestyle changes to counter the damages done by technology on the earth (Commoner 1976).

In Nigeria's Niger Delta, there are voices akin to that of Berry that have objected to the damage done to the environment and to communities in the process of oil and gas exploration. One of the foremost voices in this regard is that of Ken Saro-Wiwa, who, arguing from an environmental justice perspective, objected to the violence and death that oil multinationals have done to the environment. The United Nations Environment Programme (UNEP) News Center reveals that it will take more than twenty-five years to remediate the environmental harm caused by oil and gas exploration in the Niger Delta (UNEP 2011). Berry highlights the responsibility to develop technologies that are in tune with natural

processes. This should be informed by three considerations - extending human responsibility to include protecting the environment through being cautious in the use of technology, democratizing the use of oil technology to ensure that those affected by it are part of the decision-making process, and cultivating a new understanding of the good life that includes the deep ecologist idea of preserving wilderness (Briggle 2009, 307-309). The idea of wilderness refers to “a natural environment which has not been modified or affected by human activity” (Stranks 2008, 475). Preserving wilderness means restricting or even banning human activities in designated wilderness areas; but it does not exclude legitimate human efforts, especially on the part of governments, to conserve biodiversity in such areas.

It is important to be vigilant with regard to oil technology whose catastrophic impact is manifest. Recall the damages caused by the 1989 Exxon Valdez oil spill in Prince William Sound, Alaska and the recent BP oil spill in the Gulf of Mexico. The harm to humans and the environment is tremendous. One need only to pick up a daily newspaper to see that human reliance on technology is a major contributor to the deterioration of the environment (Gruen 2001, 439). The Niger Delta witnesses numerous oil spills and petroleum fire disasters that often result in the destruction of human lives, property and plant and animal life (Ekeh 2007). Berry asserted that one of the most environmentally hostile enterprises is the petroleum industry which has produced all kinds of chemicals and by-products that have caused the extinction of species and disturbed the ecosystem (Berry 1999, 154-155). In this Berry is in consonance with the concerns of Rachel Carson (1962), who called attention to the chemical toxins that are damaging the environment.

In the Niger Delta the implication of Berry’s idea is a call for transforming technology. It is neither a plea for technological optimism which has unbridled faith in the powers of technology, nor an appeal for an anthropocentric technology that takes only the human interest into consideration. Berry advocated for an ecozoic relationship between human beings and the earth. The human-earth relationship ought to be a mutually beneficial one in which human technologies are coherent with earth technologies. In the Niger Delta this implies that oil technology ought to be redesigned to ensure that the workings of the ecosystem are respected. Berry’s outline of what an ecozoic era entails is relevant to the Niger Delta. According to his *The Dream of the Earth* (1988), technologies should not operate in a despotic manner causing deforestation and harming lives. They should not alienate us from the earth, but rather foster sustainability. They should be integral innovations that take care of their waste products. They should foster a new cosmology and be proactive

in preventing violent aspects of nature. They should function within a bioregional context, and not simply on a national or global scale. This last point is vital: oil technology should not simply be transferred from western countries to the Niger Delta. Not only must there be a thorough environmental impact assessment before the technologies are used, but the technologies should be specifically made with the context of the Niger Delta in mind, since it is a very different terrain from that of western countries where the technologies are designed.

As Gruen (2001, 442) has correctly observed, "when technology can aid in protecting the natural world and can be developed and implemented in a non-coercive and participatory way, then it is morally acceptable. When, however, technology is damaging to the environment or is undemocratically developed and forced on people it is open to criticism on moral ground." It is true that humans are part of nature. Yet, it will not be enough to argue that human culture is as natural as predation in nature. There would be no objection if all aspects of technology enhanced human life and environmental balance. It is humans who make use of technology. The human person is a moral being, and so the use of technology cannot be excluded from moral discourse. Technology must be used with the aim of achieving the highest good (Nwoko 1991, 110). This good is inclusive of both the human and the entire biotic spheres. Thus Berry's views on environmental conservation are relevant to the Niger Delta, where, in the process of oil and gas exploration, dangerous chemicals have been released into the environment.

Conclusion

The Niger Delta has experienced environmental degradation in the process of oil and gas exploration. This has not only resulted in the suffering of human beings, but also the extinction of some plant and animal life-forms. The technology that is used in oil exploration was not specifically designed with the Niger Delta in mind. Oil exploration is mainly motivated by profits and cares little for the biotic well-being of non-human lives. Berry related how technology has caused harm to the air, water and soil and destroyed ecosystems. He was cognizant of the good that technology has brought. Nevertheless, he insisted on the need to design human technologies that are in tune with the natural processes of the ecosystem. According to him, this will be at the heart of the ecozoic age, when humans will live in a mutual and healthy relationship with the earth. All hope is not lost. Though humans have devastated the planet through their technologies, they can salvage it. They have the ability to design environmentally friendly technologies.

In order to combat the abuse of oil and gas technology in the Niger Delta, it is not enough to have better oil and gas equipment and facilities or repair old ones; instead, there needs to be an improvement in the moral eco-consciousness. Both personal and corporate attitudes to the environment determine how humans treat the environment. A perception that the environment does not simply exist for human consumption or pleasure but for the betterment of all life forms on the planet, and that human technological presence ought to protect nature will promote better technology. Policy on the environment ought to be informed by ecocentric values: only then will there be better practices in the management of the environment. This is the relevance of the ecosophic ideas of Thomas Berry. There is no doubt that if his prescriptions on an integral technology-earth relationship are implemented, they would help to create a better Niger Delta. The need to transform both the Niger Delta and technology is more urgent than ever before; and since oil technology has caused much harm to the peoples and environment of the Niger Delta, the same oil technology must make a vital positive contribution to remediating the Niger Delta.

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