



universität
wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

The Cultural and Health Effects of Water Pollution on the
Ughelli People in Delta State, Nigeria

verfasst von / submitted by

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angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of
Master of Arts (MA)

Wien, 2015/ Vienna 2015

Studienkennzahl lt. Studienblatt /
degree programme code as it appears on
the student record sheet:

A 066810

Studienrichtung lt. Studienblatt /
degree programme as it appears on
the student record sheet:

Masterstudium Kultur- und Sozialanthropologie

Betreut von / Supervisor:

Univ.-Prof. Dr. Peter Schweitzer

Acknowledgment

During the time of writing this thesis I received support and help from a lot of people. In particular, I am profoundly indebted to my supervisor Prof. Dr. Mr. Peter Schweitzer, who was very generous with his time, and for his assistance to me in each step of this thesis. I am grateful to my interview partners during my fieldwork, among whom were Mr. Johnson Olotu, Mr. Samuel U. Eriwo, Ms. Esther Erder, Ms Esther Onoghure, Mr. Andrew Osunbo, Ms. Mary Chadu, Igho Chadu and others. Many thanks to Elisabeth Huber, Emma Street and Elise Papineau for reading through my thesis.

Finally, my thanks goes to my husband Werner H. Scholz who was supportive to me in the course of writing this thesis.

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1. Introduction

*If you want go wash, na water you go use
If you want cook soup, na water you go use
If your head dey hot na water go cool am
If your child dey grow, na water he go use
If water kill your child, na water you go use,
Nothing without water
Water, him no get enemy*
(URL 1: Fela Kuti song lyrics 1975).

Water is the most important vital natural resource in the world because there is nothing that is as important. Without water we cannot cook, wash our clothes and build our houses, etc. *Water, him no get enemy*, this is what Fela Kuti expressed in one of his famous songs, because water is of importance to all mankind. At the same time, water is essential for the survival of all living beings all over the earth. Water is the world's most precious resource, however, it has been depleted by human beings which has resulted in a shortage of potable drinking water worldwide.

According to the World Health Organization (WHO), the quality of drinking water has been a key pillar of primary prevention for over one and a half centuries. It continues to be the means of prevention and control for waterborne diseases. The predominant waterborne disease diarrhoea, has an estimated annual incidence of 4.6 billion episodes and causes 2.2 million deaths every year (2010: 1). Additionally, the U.S. Department of State on water issues (URL 2: Department of State on water issues US 2010) also states that "by 2025, as much as two-thirds of the world's population could be living under water-stressed conditions where water becomes an impediment to health, peace, and socio-economic development".

In Ughelli in particular and in Nigeria in general, the problem with water sources is not the access to water but rather the insufficiency of good-quality drinking water, which is a result of environmental pollution and degradation. Several Nigerian academics from different disciplines living in Nigeria and outside of Nigeria have in recent times focused on environmental degradation. In the Niger-Delta area, oil exploration degradation is a special problem to the whole environment. This is the place where urban Ughelli, the case study of my thesis, is located.

Several studies have attested to the discovery of oil in the Niger Delta in the 1950s, and since then, an estimation of more than 4,000 oil wells had been drilled (e.g. Adeg 2011: 5). For example, the Shell-BP had acquired since this time forty-six oil mining leases covering fifteen thousand square miles, and its oil operation across the basin is also expanding rapidly (Watts 2011: 52). Therefore, these constitute the potential pollution, such as drilling wastes, drill cuttings, oily sludge and various toxic hazardous chemicals (Adeg 2011: 5). Another cause of environmental pollution that effects water sources comes from oil spill incidents in the Niger Delta. Consequently, numerous soil nutrients have been destroyed which makes farmlands useless for agricultural activities, which in addition destroys the crops and trees. Oil spills also pollute water sources (rivers, creeks, and streams) and destroys the marine life such as fish or other aquatic animals. As a result, farmers and fishermen are displaced from their occupations for a very long time before the polluted lands or rivers/creeks are restored to their original state (Ukaga 2012: 7).

Accordingly, the US Department of Energy estimates that since the 1960s, there has been more than 4,000 oil spills. Thus, discharging several millions barrels of crude oil into ponds, ditches, creeks, beaches, streams and rivers in the Niger Delta (Nduka 2011: 238). In the Nigeria Medical Journal (2013: 11), it was also attested that oil spills affected 1500 communities in the eight crude oil producing states in Nigeria. These were mainly from the 5284 oil wells that were drilled until 2006, and the 7000km of crude oil pipelines that criss-crossed the Niger Delta region. Hence, oil spills often result in the contamination of surface water with hydrocarbons and trace metals, as measured using atomic spectrometry.

Another reason for water pollution in Nigeria is waste disposal, which is a result of the problem with waste management. One of the reasons behind this is the high concentration of population in urban environments and the waste generation management. As recorded in 1921, only 8 percent of Nigeria's population was living in urban areas. However, the figure rose to 20 percent in 1970, 30 percent in 1993 and then 40 percent in 1996 (Efe 2013: 4). For this reason, in most cities, waste is gathered into heaps on the already overflowing open dumps. Yet, there are no awareness rising initiatives by the government that would encourage the people to avoid environmental degradation. Hence, the main sources of water pollution include municipal, industrial and agricultural waste (Adededeji and Ako 2009: 643).

The general aim of my thesis is to look at the changes of environmental degradation of water sources in Ughelli. In other words, how these changes affect health challenges like waterborne diseases, and economic activities such as fishing and the use of water in everyday life. The Ughelli population was once well known as farmers and fishers. Due to the effects of industrialization and environmental degradation on water sources, most of its inhabitants have changed from farming and fishing to other commercial businesses. Presently, in terms of fishing, most people establish fish-farms. This means artificial ways of keeping fish. In terms of potable drinking water, new water companies are being established yearly as well as other alternatives like borehole water system and the emergence of private water taps.

This thesis draws on anthropological theoretical frameworks, which examine the cultural meanings and interactions of a particular ethnic group with water. Thus, analyzing the ways in which water related social activities are organized as well as the perception of formal qualities of water and the experience of drinking water. I will also focus on theories from environmental anthropology on water and infectious diseases, water in environmental justice, water in historical ecology, and water in political ecology. Here I will describe the concept on how to situate and understand the politics and policy aspects of human environmental relationships. For example, Ignatius Adeg (2010) "Corruption and Environmental law; the case study of Niger Delta". This dissertation focuses on Niger Delta Nigeria, looking at the role of corruption in environmental degradation. It explains pollution of drinking water in Niger Delta as a situation of waste dumps from drilling sites; radioactive materials and oil spill which are recklessly dumped into rivers and lakes.

Thus, in this thesis I will focus on how different groups of people in Ughelli experience these changes and the effects of water pollution, and also what the people presently do to manage these challenges. I will also look at new strategies, which the people see as solutions to the problem associated to water pollution. It is also my aim to look at the meanings and values given by the people to water in the olden times compared to today. Additionally, I want to know the importance of water in the traditional religious aspects of Ughelli people and how this has changed because of modernization.

Therefore, this thesis draws on ethnographic findings from the research I conducted in the month of August 2014 in urban Ughelli and in two of Ughelli's peri-urban communities. The qualitative research involves individuals and experts' interviews,

participant observation, and photography. The various groups of participants who were interviewed consisted of twenty-one elderly persons and youths who were born and raised in urban Ughelli, a doctor, a water company manager, two fish farmers, two borehole drillers, and an employee at the Ughelli North Urban Water Board Division (UNUWBD) as well as little children and adults at shell public tap and a private manual tap.

1.1. Personal Interest

I choose this topic first, because I am from Ughelli in Delta State of Nigeria. This is the Niger Delta region of Nigeria, where the changes of water pollution currently affect the daily life of its inhabitants, as I mentioned above. However, very little has been written on how the inhabitants perceive water pollution in Ughelli. At the same time, less awareness is created on this problem, which does indeed exist. It is not only a problem of the contemporary Nigeria, but it is a problem especially in developing countries. I say this, because when I was still in school (primary and secondary school), there were no basic subjects that focused on environmental issues. Back then, we only had a subject that focused on physical and health education (bodily hygiene and sport), but it was not focused on the causes of environmental degradation in Nigeria at this time.

I grew up in Nigeria before I came to Austria. At the time, I was always falling sick from typhoid fever and was also often hospitalized. During this time, I never thought of the causes of that typhoid fever, this was also I was the only one who suffered from it within my family. Most people usually fall sick from waterborne diseases. However, not everyone who is sick goes to hospital for blood check. This makes it more difficult for people to know the effects that water pollution has on their health.

Second, during my studies preparation course (Vorstudienlehrgang der Universität Wien), in order to be admitted as a regular student in the 'Department of Cultural and Social Anthropology', I had to learn the German language. In this class, we learned contemporary topics such as the causes of environmental pollution, the use of computers, and living conditions in Austria. However, of all the topics, I found the causes of environmental pollution more interesting because of the reasons already mentioned above. I also came across this topic again when I had started my master-studies 'cultural and social anthropology'. When I had the chance to choose topics that

were of interest to me, I took the seminar course "Sustainable Cities: das Afrika der Städte". The focus of this seminar was on environmental degradation, the increase of pollution in Africa and environmental management in Africa. After taking this seminar, I made up my mind that this would be the focus in my master's thesis.

Finally, water related issues are contemporary focal points not only in the field of anthropology, environmental anthropology, medical anthropology, religious anthropology and bio-cultural anthropology, but also in global environmental change discourse. For example, anthropologists have in recent times focused on water scarcity and insecurity, water sustainability, and water pollution (Wutich and Brewis 2014; Orlove and Caton 2014; Nilsson 2006; Colten 2005). Amber Wutich and Alexandra Brewis (2014) focus in their essay 'Food, Water, and Scarcity' on the causes and consequences of resource insecurity (Wutich and Brewis 2014: 444). On a global level, different ministries have set goals to meet water security e.g. the Ministerial Declaration of The Hague on Water Security in the 21st century (URL 3: The Hague 2000). This is because of the lack of access to adequate and safe drinking water to meet basic humans needs in the 21st century. Recently, environmental anthropologists have contributed to the cultural explanation of particular environmental problems as well as to a universal explanation that is based on the theory of human nature (Shoreman-Ouiment and Kopnina 5). Additionally, environmental anthropologists have sought to provide updates on the state of science and the theoretical and methodological pressing global, political and social issues in the field of anthropology (Shoreman-Ouiment and Kopnina 2011: 1). The issue of water quality as lived experience has been observed by environmental anthropologists Merrill Singer and Jacqueline M. Evans (2013) in their paper 'Water Wary Understandings and Concerns about Water and Health among the Rural Poor of Louisiana'. Singer and Evans examines in their paper the daily-to-day understandings of and attitudes towards water, for drinking and cleaning of self and children, among low-income rural African Americans in Louisiana who live in an "impacted environment," one that is subject to considerable pollution and manipulation (Singer and Evans 2013: 173). As Orlove and Caton point out "anthropologists contribute by seeing water not only as a resource, but also as a substance that connects many realms of social life" (Orlove and Caton 2010: 401).

Based on these interests that I mentioned above, I find environmental problems relating to water pollution in Ughelli as an important topic to serve for my master's

thesis. This will enable me as an anthropologist to have knowledge about the people's perceptions and explanations of environmental issues concerning the water sources in Ughelli.

1.2. Research Questions

1. To what extent does water pollution change the cultural and economic life of Ughelli people? For example, how does the use of the river as well as the different sources of water provision in Ughelli change because of water pollution?
2. What are the perceptions of different groups of people in Ughelli on water pollution and how are they adapting to the changes that accompany water pollution? How do these perceptions differ according to age and profession?

1.3. The Structure of This Thesis

The first part of this thesis covers the introductory chapter, theoretical framework and methods. I started in the introduction by expounding on the importance of water as an essential substance for the survival of all living beings. I also reviewed some studies which have already investigated the problem of water degradation in the Niger Delta. Furthermore, I gave a short description of the theories and the methods I used to carry out my ethnographic fieldwork, which I used in the thesis as well as in the general aim. Next, I further elaborate on my personal interest, on my research questions.

In chapter two I focus on the theoretical framework used for the analysis of the thesis. These includes environmental anthropology theories from historical ecology, political ecology and environmental justice theories. In the second chapter, I also elaborate on anthropology of water as well as the religious definition and some examples of water related studies with a particular focus on religious practices.

In chapter three, I expound on the description of the ways I carried out my ethnographic research in the month of August 2014. I first described how I conducted my semi-structured interviews with both individual persons and experts in Ughelli. Second, I described the different observation I made in Ughelli. These include Shell public tap

and a private tap, rivers, one fish farm, UNUWBD, markets, a water company and the ways houses are structured. I also explained the collected data.

The following five chapters describe my ethnographic results on the cultural and health-related effects of water pollution on the Ughelli people of Delta State Nigeria. Therefore, in chapter four, I started with the description of my case study and the study area and the people of Ughelli. So, I elaborate on the location of Ughelli in Delta state, Nigeria as well as a short description of Ughelli North and South local government areas. However, my ethnographic fieldwork was conducted only in the Ughelli North area.

In chapter five, I explain the various causes of environmental degradation of water sources in Ughelli according to the perceptions of the people as well as my personal observation. These include oil exploration chemical and toxic waste, factory's waste and domestic waste pollution on water sources such as rivers, streams and ponds as well as ground water and surface water.

In chapter six, I explain the effect of water pollution on the people and the aquatic animals. There I started by explaining the information a doctor at the Ughelli general hospital gave me about the health implication of water pollution. In this chapter I also describe how the people of Ughelli expressed their experiences of waterborne diseases to me. I also give a short description of water pollution effect on the aquatic life. In this chapter I continued with the different sources of drinking water (rivers, ponds and streams) as well as the complex cultural ways water was used in the olden days, according to the information I acquired from elderly persons. In this chapter I also describe the different types of drinking water (branded water, borehole water and Shell public tap and private manual taps) in contemporary Ughelli.

In chapter seven of this thesis, I look further on the importance of water in the economic life of the people of Ughelli in the olden times and how this has changed as a result of urbanization and water pollution. Then, I expound on the sources of fish in the olden times and the ways in which the people acquired wild fish (in the olden times, the people ate wild fish). Furthermore, I expound on the sources of fish sold today in both Effurun market in Warri and Ughelli central market. In this chapter I also describe fish farming which I call the new trend in Ughelli.

In chapter eight, I describe the meanings and values of water in the olden days compared to nowadays, based on the perceptions of elderly persons on how people of today treat water sources in a careless way. Then, I also give a short explanation of traditional religious changes in the use of water in Ughelli. This change, however, is not only caused by water pollution, but also by the growing beliefs in Christianity.

In chapter nine, I focus on the role of the municipal government in supplying water in Ughelli. I continue by explaining my childhood experience on how my older siblings and I went to the private tap in the late 1980s to fetch drinking water, which was supplied by UNUWBD at that time. Then, I describe how the UNUWBD was functioning before today and the reason why it is not supplying water anymore. I also make reference to the National Agency for Food and Drug Administration Control (NAFDAC) who is not doing their work properly because not all the branded water in Ughelli is safe for human consumption. I also give a short explanation on the perceptions of the people in regards to health workers and environmental workers on inconsistent performance in carrying out their duties.

2. Theoretical Framework

In the following I will expound on the theoretical framework I intend to use for the analysis and discussion of my thesis.

2.1. Environmental Anthropology

The problem of water pollution in contemporary times, especially in developing countries, is a life threatening issue because it affects the health of urban city dwellers and aquatic animals. The reason why there are more health problems from water pollution in urban cities today in developing countries is based on rapid growth of urban population and also the increase of waste production. Moreover, no resilient solutions have been provided for waste reduction. Thus, streams and rivers are now used to sink waste from industrial factories as well as domestic waste. This can be understood through the distinction of consumption issues. For instance, environmental anthropologists Richard Wilk (2002) has addressed consumption issues, viz. individual choice theories and social theories of consumption. In other words, “individual choice

theories are primarily concerned with consumption as needs-driven behaviour”, and “social theories of consumption see consumption as a group phenomenon, a form of collective behaviour and signal membership” (Wilk 2002: 6). Many studies in recent times have addressed water pollution as a problem that affects not only the health of city dwellers, but also that of aquatic animals.

According to anthropologists Eleanor Shoreman-Ouimet and Helen Kopnina “anthropology of the environment or environmental anthropology is a specialization within the field of anthropology that studies current and historic human-environment relationships” (2011: 1). Furthermore, anthropologists Thomas L. Leatherman and Thomas R. Brooke point out that environmental urgency in this century, accompanied by population growth, might impact degradation of environmental resources and biodiversity. These include “increased penetration of world capitalism, resulting in higher rates of resource extraction, consumption, and waste; iatrogenic effects of modern technologies, including increased levels of toxins in the environment and new and resurgent infectious diseases; political and ethnic conflicts that produce environmental destruction, human displacement from their homelands and the loss of local systems of knowledge” (2001: 118).

In this respect, the impact of environmental degradation of water sources is one of the major health problems in African countries that not only affects human beings but also affect aquatic animals as well as biodiversity. Thus, I start by first explaining anthropological theories on water and infectious diseases, which have become a growing concern in anthropology subfields. Second, I will elaborate on water in environmental justice, as a means for understanding oil exploration as one of the major reasons for health problems in the Niger Delta. Third, I will discuss water in historical ecology as well as other studies that have already accomplished research on the historical importance of water in some communities and cites. Fourth, I will explain the theory of political ecology about environmental policies and issues, which is one of the most important aspects for the understanding of present environmental degradation. Finally, I expound on anthropology of water framings as well as the use of water in religious practices, although I will only give a short explanation of the use of water in religious practices in Ughelli. Therefore, for the analysis of this thesis, the aforementioned anthropological framework will be used.

2.1.1. Water and Infectious Diseases

New and re-emerging infectious diseases from the late nineteenth century to recent times have become a growing concern for scholars from different disciplines as well as an issue for development policy worldwide, requiring the need to survey its severity and the causes of the problem (Kunitz 1987: 379; Barrett et al. 1998: 248). Anthropological subfields, from historical ecology perspective, biological, physical to medical anthropology had been giving explanations and discussions, on infectious diseases (e.g. Leatherman and Thomas 2001; Sattenspiel 2000; Barrett et al. 1998; Newson 1998; Wirsing 1985; Kunitz 1987; Cockburn 1971). Most importantly, all these studies on infectious diseases are built on the interrelationships between parasites, human hosts and their environments (e.g. Cockburn 1971; Newson 1998).

Since the 1960s, biological anthropology came into existence, “with a merging ecological and evolutionary perspective, in which the concept of adaptation provided a powerful means of understanding human biological diversity and change” (Leatherman and Thomas 2001: 114). Within anthropology another subfield of anthropology, physical anthropology, also applied the evolutionary perspective, however, with a focus on races as “ideal types”. Hereafter, the human population became a focal point of evolutionary analysis as well as the environment as the principle for organising features of human adaptation, and social conditions (Leatherman and Thomas 2001:114). In this view, Frank B. Livingstone’s work on sickle cell gene distribution in West Africa (1958), became a means of understanding anthropological studies of evolutionary perspective in finding genetic disposition in contemporary human populations (e.g. Inhorn and Brown 1990: 91-92; Leatherman and Thomas 2001: 114). Livingstone had shown in his concept that two results of agricultural revolution account for the change in the role of disease in human evolution. He describes at first the great changes in the environment and secondly the huge increase in the human population, and continues to explain that these seem to be involved in the development of holoendemic malaria. When human population disrupts the vegetation of any area, they severely disrupt the fauna and often cause the disappearance of mammals, particularly the large ones. This makes many parasites of these animals adapt to human population as their new host. Secondly as human population increases rapidly, this population remains sedentary and human beings also became the most widely spread living beings. This

results to human population as the only available blood meal for mosquitoes as well as the only host for parasites. "This change resulted in the adaption of several species of the *Anopheles* mosquito to human habitation and adaptation of many parasites to man as their host" (Livingstone 1958: 556).

However, anthropological frameworks focused on the evolution of human disease interactions assume that there are a number of factors in the shift of infectious diseases. For example, Cockburn concentrates on two factors, "the pre-human and human hosts and their environments during the period of man`s from the earliest days to the present" (1971: 45). According to Cockburn a number of distinct eras can be discerned, among which are the precursors of man, early man, agricultural man, industrial man and man of one world (1971: 45).

Other anthropological studies in recent times see new and re-emerging infectious diseases such as waterborne diseases to be associated with environmental change (e.g. Newson 1998; Sattenspiel 2000). In this regards, changes like anthropogenic environmental disruptions include any changes, such as those that can increase exposure, reduce coping capacities, lower resilience to the consequence of biological, social, and economics of disease. Deforestation, construction of roads, irrigation canals and dams; poor sanitation and hygiene; climate change; migration; urbanization and, inadequate health services are seen as environmental, demographic, and social conditions that are linked with infectious diseases (Leather and Thomas 2001: 122).

Hence, these recent studies see water disruption as result of waterborne diseases. Linda A. Newson describes human environmental change to be associated with increased incidence of diseases resulting from irrigation and dam building. These activities as Newson stated "create stagnant water bodies that constitute favoured habitats for the reproduction of mosquitoes and snails involved in the transmission of and schistosomiasis" (1998: 48). Additionally, Inhorn and Brown also described the rapid spread of schistosomiasis in places like Africa as almost entirely due to programs of water sources development involving the construction of high dams, man-made lakes and reservoirs, and irrigation canals (1990: 98).

Within these regards, Lisa Sattenspiel`s (2000) work on 'Tropical environments, human activities, and the transmission of infectious diseases' describes tropical regions of the world to be more affected by infectious diseases than the temperate world. Sattenspiel states that the risk of transmission in the tropical regions is higher

largely because of the wide distribution of inadequate water sanitation systems. That alone makes some places to be the “emergence of chlorine-resistant strains of cryptosporidiosis and giardiasis” (2000: 11), cryptosporidiosis being a parasitic disease that effects the intestines, and giardiasis being a zoonotic parasite that inhibits the digestive tract the causes diarrhoea, loss of appetite, vomiting, watering stool, stomach cramps, etc.

The problem of waterborne diseases mostly affects children in tropical regions. Because of the tropical rain seasons that come with the occurrence of floods, this worsens the problem of inadequate sanitation systems, thus resulting to high volumes of sewage overload flowing near dwellings and children. These alone can lead to waterborne diseases such as diarrhoea and other severe disease consequences (Sattenspiel 2000: 11). Population growth, especially in Africa, results in a lack of plots of lands for building water systems or wells for household use and this is also seen as a reason for waterborne diseases. As Settenspiel also states, the population density in Africa is now posing problems because plots may be too small for placing wells. Normally it is recommended to dig a well at least 30m from a pit latrine, but because of small plots today, most latrines are too close to the well, and this alone causes contaminated water (2000: 11).

2.1.2. Water in Environmental Justice

“The term environmental justice is derived from an analysis of the links between toxins and waste in U.S. communities and has distinct political meaning, over the past few years the environmental justice framework has been expanded to include diverse peoples and the problems from around the world and used to explore the links between environmental crisis and human rights abuse” (Johnston 2001: 134). Although environmental justice comes from within mostly white middle-class nationally based environmental conservation groups and people of colour grassroots activists, the term is now used in academia. The term environmental justice was used to bring about change in environmental policies to impact the lives of poor people of their society (Johnson 2009: 20).

As Glenn S. stated in 1992 after a meeting with community leaders, academics, civil rights leaders and the U.S. Environmental Protection Agency (EPA; under the leadership of William Reilly) they admitted that there was a problem and established the Office of Environmental Equality. Afterward the name was changed to the Offices of Environmental Justice under the Clinton administration (Johnson 2009: 21).

In the subfields of anthropology, environmental racism and environmental justice are of growing concern and of research interest among environmental anthropologists and political ecologists. Additionally, “biological anthropologists have in recent times entered this arena by examining the distribution of risk and consequence to pollution in urban environments” (Leatherman and Thomas 2001: 120). For example, anthropologist Larry Shell (1997) modelled the social determinants and biological consequences of exposure to lead in urban environments. Shell shows that “chronic exposure to ambient lead in air, food, and water produces detrimental effects on growth, cognition, reproduction, and other physiological parameters (e.g., disruption of haematological, neurological, and kidney function)” (Leatherman and Thomas 2001: 120).

In this sense, many recent studies have investigated the Niger Delta region of Nigeria. Centred on various analyses and surveys that were carried out in the oil-bearing communities of Niger Delta, it shows that oil spills could lead to reduction in household food security. This is as a result of prevalence in childhood malnutrition, causing infertility, cancer and long-term effects on human health (e.g. Nigeria Medical Journal 2013; Godson al el. 2009).

For understanding environmental risk factors in the Niger Delta, especially because of oil exploration, Francis O. Adeola (2009) summarized the major environmental impacts of oil and gas activities from exploration to extraction, refinery, and transition in the Niger Delta as follows:

- Deforestation – Forest are cleared during exploration, and access roads, navigable canals, pipelines, and oil wells are constructed without regard to environmental protection; SO₂ (sulphur dioxide) and NO₂ (nitrogen dioxide) released into the atmosphere contribute to acid rain and deforestation.
- Toxic waste dumping – Oil residues and other waste are dumped into rivers, wetland, and the sea or in the open oil wells that kill or contaminate fish and other marine

species. Consumption of fish high in mercury and other heavy metals has been linked to serious health problems in humans.

- Destruction of soil and water – In the process of laying seismic lines for oil exploration and construction of access roads and canals, hydrological equilibrium is disturbed and the soil is damaged beyond regenerative capacity.
- Frequent oil spills and leakages – Major oil spills occur on a regular basis in the Niger Delta without due accountability and clean-up. Also, oil leaks from improperly maintained rusty pipelines into agricultural lands, wetlands, and rivers rendering them barren. Available data show that between 1976 and 1999, approximately three thousand oil spill events were reported by oil companies operating in Nigeria, which translate into more than two million barrels of oil spilled into the environment without a comprehensive clean-up effort. Since the majority of the people in OBSs (oil-bearing communities) depends on agriculture and fishing, their livelihood is often destroyed and that fuels the anger against the MNOCs (multinational oil companies). High- pressure oil pipelines laid across Niger Delta villages and towns transporting crude oil, motor spirits, diesel and gas, rupture quite frequently either by defect or vandalism, causing oil spills and forest fires that destroy arable lands, crops, forests, aquifers, human lives, and wildlife.
- Gas flaring – More than 76 percent of the gas released during oil extraction in Nigeria is flared (i.e., burned), making the country number one for gas flaring in the world. Gas flaring plants are in close proximity to people`s residences, and the flaring is carried out day and night with continuous lighting in certain areas. The emissions of SO₂ and NO₂ into environment have been linked to adverse health effects among the residents of the OBCs. The emissions of CO₂ (carbon dioxide) and CH₄ (methane) contribute significantly to global warming and the greenhouse effect, and the emissions of SO₂ and NO₂ significantly contribute to acid rain.
- Health problems – Gaseous pollutants, oil spills, and dumping of toxic wastes have adverse health effects on resident pollution of human and nonhuman species. Among the health effects of gaseous pollutants and persistent organic pollutants released in the course of oil production, processing, storage, and transportation are headaches, eye and skin irritation, dizziness, liver disease, cancer of various sites, birth defects, embryo toxicity, and reproductive disorders. People who live in the immediate vicinity of gas flaring and oil production facilities are registering in growing numbers of health problems previously known to their communities (Adeola 2009: 145-146).

2.1.3. Water in Historical Ecology

As Heather J. Hoag (2013: 6) noted, “a history that views water as lead actor in shaping the human and natural environment is not new to the field of environmental history”. Studies from different disciplines have addressed the historical ecology of water around the world in order to understand the historical landscape of places and the importance of water to first settlers of a particular region. Additionally, recent studies have also addressed the changes and continuity of water sustainability today by looking at the history of such communities. In the context of history of environmental change, anthropological approach answers the question of “How did we get here” (Winthrop 2001:206).

An example of water in historical ecology and the importance of water to first settlers is an African study book series by James F. Searing (1993). This book is about West African slavery and Atlantic commerce in the Senegal River Valley from 1700 to 1860. In this book, Searing used oral traditions to describe the historical ecology of Lower Senegal patterns of settlement. According to him the myths of Wolof, Sereer, and Lube as earlier settlers were connected to the search of water after a long migration from their various homelands (Searing 1993: 1). In this regard, current studies about Nigerian rivers have particularly addressed the historical ecology of `Osun River` that is located at the Osogbo town in South-western Nigeria, which has a rich cultural heritage today, to be the result of the search for water by an ancient ruler of Osogbo community (e.g. Joni 2009, Omojola 2011, Ogundiran 2014).

Another African example is a book on environmental history by historian Hoag (2013). This book is about the development of the East and West African rivers. Hoag offers in this book the key themes of African rivers history, in order to understand the different ways people have interacted with African rivers. Additionally, she also reflects the central themes of rivers in African history – European exploration, colonial agricultural development, postcolonial economic development strategies and conservation.

The problem with cities and water pollution is already a historical problem in developed countries since the early 20th century. For example, Craig E. Colten (2005) with his paper “Cities and Water Pollution”, through the use of historical and geographic perspective, describes the opening of Chicago’s Sanitary and Ship Canal as an event of pollution history (Colten 2005: 439-440). Thus, Colten shows through the evidence

and testimony of trial that there was already evidence in 1905 of typhoid bacteria cases in St. Louis as result of dangerous nuisance that were exported into the Great Lakes and the Mississippi River basins. Furthermore, Colten also explained that in 1908, larger cities such as New York and New Jersey had the same problem of water pollution trial alleging an impending sewage release from cities in the Passaic River valley (Colten 2005: 440).

Studies about historical ecology on water sustainability in Africa are by David Nilsson, who has shown in two separate articles the historical ecology of water sustainability. One (Nilsson 2006) is about a heritage of unsustainability, the large-scale of water and sanitation system in Kampala, Uganda and the other (Nilsson 2008) is about pipes and politics, a century of change and continuity in Kenyan urban water supply. In Kampala, Nilsson described the evolution of pipe water sewer system between 1920 and 1950 as the influences on the later development of the city (Nilsson 2006: 369). In Kenya, Nilsson focused on urban water supply sustainability from the 1920 until the 1980s, to look at the ways that institutions, organizations and technology interact with political, economic demographic processes.

Thus, this master`s thesis will not only look at the historical importance and meanings (below) of water to the fore-fathers of Ughelli but also the historical role of water in Ughelli. Subsequently, I will describe the complex ways in which the people of Ughelli interacted with water in the olden times and in the present days. In this sense, I will discuss why water was important in the cultural lives of the people and why water was important in economic activities by the Otor-Ihwreko river banks.

2.1.4. Water in Political Ecology

Environmental anthropology, in ecological politics, engages with both domestic and international environmental policy. According to Susan Charnley and William H. Durham, anthropologists are concerned with environmental policy because it not only affects the land and its resources but it also has major implications for social justice and human health (2010: 397). Political ecology also offers the clear excitement of policy-oriented politics, radical critique to influence both technical policy and public opinion (Crumley 2001: 4). Peter B. Larsen (2011: 75) has also argued that the relevance of anthropology is grounded in its capacity to critically address how policy

matters intersect with human environment relationships. Furthermore, this requires addressing the multiple levels, effects and intersections of policy in everyday relations as well as an agenda requiring multiple theoretical frameworks and empirical details.

Water pollution, its health effects and the ways in which people deal with it are the main focus of this thesis. In this regard, recent studies in applied anthropology have acknowledged water insecurity in developing countries as a ‘political dilemma’ (Boelens and Seemann 2014).

As Orlove and Carton put it, “many anthropologists look to see how different groups insert themselves in the larger debates over water sustainability. This question leads researchers to examine the strategies of water sustainability discourse and to compare the framings that consider practical challenges with solutions and the framings that address broader relations among states, societies, and environments” (2010: 405).

In this sense, the framework in this thesis focuses on environmental awareness, which is a global issue today. It actually began with the Stockholm Summit in 1972 and continued in Rio de Janeiro in 1992, and then more African countries joined the World Summit on Sustainable Development in South Africa in 2002. This entails a wide range of new laws, policy frameworks, regulatory monitoring instruments coupled with active involvement of both national and international NGOs (Adeh 2010: 1-2). The access to potable drinking water concerns environmental awareness.

However, there is no active awareness program in the Niger Delta region of Nigeria, where the ground water is more polluted because of oil spillage. As a result of this, many current studies have focused on the Niger Delta laws and policy frameworks and they blame the political leaders as corrupt for lack of access to potable drinking water for the majority of the Niger Delta population (e.g. Adeh 2010, Agbiboa and Maiangwa 2012).

In the late 1990s, government policy on environmental issues remained ineffective. Furthermore, as the natural resources of the Niger Delta such as land, water, wildlife and biodiversity continued to be degraded with significant effects on the health and the socioeconomic life of the people, new movements did arise. Three political militant groups emerged in the Niger Delta region in the last twenty years. However, it is hard to separate political movements from criminal gangs in the Niger Delta due to the fact that some of them are involved in bunkering (i.e. illegally filling a ship with oil for sale

in the black market) (Cline 2011: 278). These groups were supposed to create initiatives for solving environmental problems but the problems remained the same.

Political ecology also focuses on environmental policy programs such as programs organised by the United Nations (UN). An example of such environmental program is the UN Millennium Summit held in September 2000 Millennium Development Goals (MDGs) and among the targeted goals in this program is environmental sustainability. Here the world leaders agreed to a set of specific, measurable, time-bound and tough targets for intensifying a focused programme to eliminate poverty, disease, illiteracy and environmental degradation (OECD 2003: 4). Thereby, eight goals and targets were set up in which most of these goals and targets are to be achieved by 2015. One of the goals is to ensure environmental sustainability such as to reduce by half the proportion of people without access to safe drinking water by 2015 (OECD 2003: 8).

Nigeria is among those countries that adopted MDGs (access to drinking water) to be achieved by 2015 (Adedeji 2009: 643). Yet, in Nigeria after almost 15 years of the declaration of the MDGs, almost all the people lack the access to potable drinking water. However, as I already mentioned above, the most affected population without the access to potable drinking water in Nigeria is the rich oil producing area of the Niger Delta, where Ughelli, the region of this case study, is located. With this regard, I will discuss below why the MDGs goals are not successful in Ughelli.

Water sustainability is the main focus of this study. This master's thesis draws on my ethnographic findings which expounded on the failure of the municipal government on water policy, the Ughelli North Urban Water Board Division (UNUWBD) for not supplying potable drinking water for the population of Ughelli. Specifically, the UNUWBD, which is supposed to provide potable water to the people of Ughelli, has not been doing that for the majority of the people for more than two decades now. The reason for this lies in the hands of the Ughelli North Municipal Government and their inconsistent policy towards water sustainability. The Ughelli North Municipal Government's policy in the UNUWBD can be seen from two premises. First, privatisation of the UNUWBD to incompetent companies to care for the infrastructure and water supply. Second is lack of participation, in other words, there is a gap of misunderstanding between the people and the municipal government in how the UNUWBD is managed. While looking at the lack of participation, I discussed this issue based on the perceptions of the people of Ughelli from my ethnographic findings.

At the same time, the National Agency for Food and Drug Administration and Control (NAFDAC) is also failing in its responsibility to inspect water companies to know if the water that is being supplied to people in Ughelli (not only Ughelli but the whole of Nigeria) meets the standards for human consumption. In this aspect, not only is the NAFDAC responsible in tackling environmental problems in Nigeria, but also, in the Niger Delta, there are also various agencies that have emerged under Niger Delta Development Commission (NDDC) funds. Thus, in this thesis I cited (below) studies (e.g. Adeh 2010) that have addressed such issues.

Another aspect of the municipal government's inconsistency with the water policy in Ughelli, which will be discussed further, is waste management. In Ughelli there is no waste management control strategy, which forces the people to use the rivers as waste dumps. In this regard, I used my ethnographic findings to examine the problem of waste disposal and management in Ughelli.

2.2. Anthropology of Water

Anthropological studies have contributed a lot to the understanding of a particular people's relationship with water. For example, anthropologists have on the one hand focused on the meaning of water to people, and on the other hand water as a substance (Hahn 2012; Strang 2004). In the sense of the 'meaning of water', as Hans Peter Hahn puts it, the anthropological perspective focuses "on the various ways men and women regard, deal with it and make an evaluation on the basis of their own experiences of and with it" (Hahn 2012: 25). An example that deals with the metaphorical use of water is imagined in the construction of ideas about the self, and the models of the relationship between individuals and their social and material environments have been explored by Veronica Strang (2004) in her book 'the meaning of water'. In the chapter two of this book, entitled 'losing water', Strang used a historical perspective on water use and management in Dorset in UK to explore the way in which people think and evaluate water today (Strang 2004: 21). According to Strang "water is always a metaphor of social, economic and political relationships – a parameter of the extent to which identity, power and resources are shared" (Strang 2004: 21).

Therefore, Strang described Dorset first land enclosures and the shift away from the collective control of water that started with the Roman invasion. For instance, the archaeological record suggests that the Celts were involved with little technological interference for the worship of natural resources, rather than of economic purposes, in the sense that the Celts placed a few stones to improve access to spring waters as well as the planting of sacred trees around holy wells. However, the Romans had great enthusiasm for the physical management of water, in the sense that they were building magnificent aqueducts to supply their towns and garrisons. In other words, the Romans introduced water wheels and mills, which established an important idea of water as a creator of physical energy, which is a generative force for economic growth. This remained for many subsequent centuries and it also created economic activities in the UK (Strang 2004: 21-22).

Furthermore, as Strang puts it, “one thing that emerges plainly in the historical account [in Dorset] is that technological development has always articulated with shifts in ownership and control, and other change in material culture has both concretised and enabled seemingly irreversible changes in the control of water” (Strang 2004: 39). In other words, water has since been in Dorset, from the Roman invasion until contemporary times, bound with social, economic and political relationships.

An anthropological example that deals with the meaning of water, in regard to water management is by John R. Wagner (2012) in his paper ‘Water and the commons Imaginary’. Compared to Strang, his approach is much more focused on ‘commons theory’. Common property as Wagner puts it, “is normally defined by distinguishing it from public property, private property, and open access” (Wagner 2012: 617). In this sense, Wagner argues that the term has come to constitute a kind of social imaginary with powerful political and ethical implications, especially with regard to water management (Wagner 2012: 617). Thus Wagner applies this approach to a case study from the Okanagan Valley of British Columbia to demonstrate its applicability within a typical North American water governance setting (Wagner 2012: 617).

This is because the Okanagan Valley is one of many settings in the world where water occupies a critical position in both symbolic and economic terms. Therefore, “the pattern of distribution of property rights to water is also typical of what occurs throughout western Canada and much of western United States” (Wagner 2012: 622). In this sense, according to Wagner, water management in the Okanagan Valley has

always been linked with economic development in the region. First as an orchard oasis surrounding valley-bottom lakes and more recently as a site for recreational and resort tourism, and simultaneously linking the global flows of capital, people and imagination.

The use of Water in Religious Practices

Anthropologist Clifford Geertz's definition of religion is as follows "(1) a system of symbols which acts to (2) establish powerful, pervasive, and long-lasting moods and motivations in men by (3) formulating conceptions of a general order of existence and (4) clothing these conceptions with such an aura of factuality that (5) the moods and motivations seem uniquely realistic" (Geertz 1973: 90). Geertz's definition of religion can be used in understanding what water means to people in the spectrum of religious practices. Anthropologist Hans Peter Hahn for example, approaches how in northern Togo "perceptions of water can radically change and how practices and socially acknowledged meanings jointly contribute to specific roles" (2012: 38-39).

Here Hahn described an event in a pond that the women used for the laundry and that the children used as a playground. One day a child drowned while playing in the water. According to Hahn the people accepted that the child had been a victim of the water spirit. Then with "the shared experience of the presence of a powerful spirit marked the beginning of rituals. From that day onwards, women who were seeking a cure of their infertility came to the pond, sacrificed a chicken or goat and asked the water spirit for help (Hahn 2012: 38). In other words, due to this particular accident with a child, the pond became a place for religious practices.

2.3. Niger Delta Overview

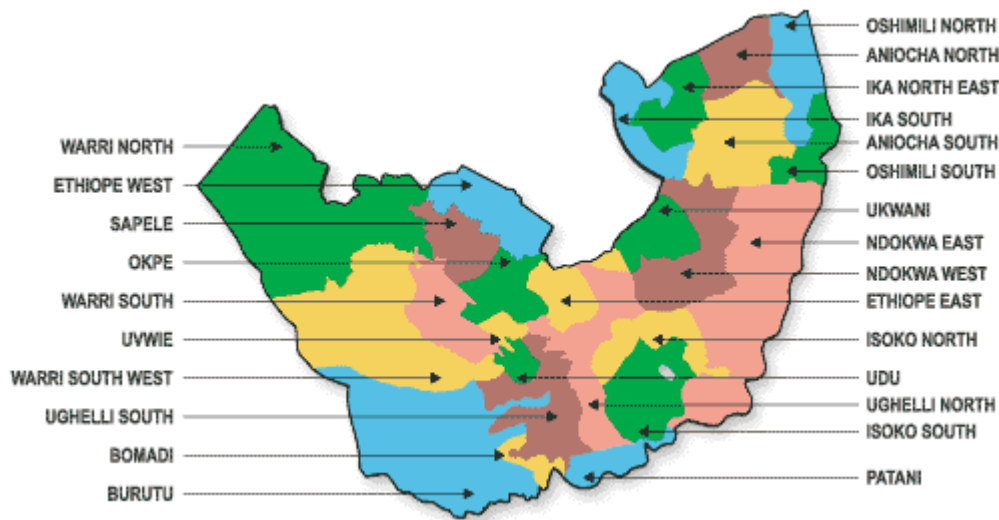


Fig.1. Delta State map (URL 4)

2.3.1. Natural Resources

Before the discovery of oil in the Niger Delta in Nigeria, the population in this region depended on water as their main source of livelihood either by means of fishing or farming. At the same time, the people also depended on water as the only way they could move around to their neighbouring ethnic groups with the help of locally made canoes. The Niger Delta region in Nigeria is the largest wetland in Africa and is considered one of the largest in the world, whose area is made up of 36,000 square kilometres of marshland, creeks, tributaries and lagoons. Furthermore, the area is a rich biosphere with natural resources such as fish and wildlife resources that are high in biodiversity and grouping of flora and fauna (Omotala in Agbiboa and Maiangwa 2012 and Ite 2013).

However, since the 1950s the main natural resource of the Niger Delta is oil and this region has become the centre of Nigeria's oil production. It has been attested that since the discovery of oil in the 1950s, close to 4,000 oil wells have been drilled in the Niger Delta and its offshore areas (Guardian News in Adeh 2010: 5). At the same time about 2 million barrels of crude oil have spilled into the Niger Delta environment since the 1960s (Okodudu in Ukaga 2012: 7). Thus, these oil spills in the Niger Delta environment have not only led to the distortion of soil nutrients, farmland, crops and

trees but it also led to water pollution of rivers, creeks and streams as well as the distortion of marine life such as fish (Adeyemo in Ukaga 2012: 7). Additionally, "Niger Delta is described as "one of the world's most severely petroleum impacted ecosystems and one of the 5 most petroleum-polluted environments in the world" (Niger Delta Natural Resource Damage Assessment and Restoration Project 2006 in Obi 2011: 221). In other words, oil is now the main resource of the Niger Delta yet it has destroyed the other natural resources in the Niger Delta.

2.3.2. States and Ethnic Groups in the Niger Delta

There are five oil producing states in the Niger Delta which are Akwa Ibom, Bayelsa, Cross Rivers, Delta and Rivers State. These states are made up of at least 25 ethnic groups (Ukeje 2010: 34), among which are the Urbobo people. The Urhobo people form one of the 7 indigenous ethnic groups in Delta State. According to Chief T. E. A. Salubi "the Urhobo are a heterogeneous people whose social organization is based on small units, commonly called clans. There are some 16 autonomous clans each ruled by an Ovie [i.e. king] or an Okpako [i.e. elder]" (Salubi 2007: 67). Although Urhobo people live in three of the major towns Sapele; Warri and Ughelli in Delta, my focus is about the Urhobo people in Ughelli.

3. Methods

3.1. Qualitative Research

Most of anthropological data are based on ethnographic research. This makes “anthropology distinguish itself from other social sciences through the great emphasis placed on ethnographic fieldwork as the most important source of new knowledge about society and culture” (Eriksen 2010: 27). According to Russell H. Bernard (2011: 20) this makes anthropology a thoroughly empirical enterprise. Ethnographic fieldwork is also seen as the only key element in the practice of anthropology and its attention has always been drawn on details present in a village or a community. Moran F. Emilio explains this (2011: 97) as the only way anthropologists are expected to carry out anthropological research. Furthermore, this preference fits well with a desire to provide a holistic picture of human society and to help ecologically oriented anthropologists to measure the relevant variables with some degree of completeness.

Water related issues have become a recent concern in the field of cultural and social anthropology as well as other disciplines, especially in developing countries. These have influenced anthropologists and scholars to carry out ethnographic fieldwork on water related issues in particular regions. An example is the research of the American anthropologist Paul Trawick (2001) on the moral economy of water in the Andean Commons. Trawick focused on irrigation and water use in a community in the Peruvian Andes. Another example that is also from Peru is by Rutgerd Boelens and Miriam Seemann (2014) about forced engagements, water security and local rights formalization in Yanque, Colca Valley, Peru. Thus, for me as an anthropologist and a Nigerian from Ughelli in Delta State, I am interested in how water pollution has affected the people and the aquatic animals in Ughelli. Hence, it became my desire to undertake my ethnographic fieldwork in Ughelli in regards to water pollution as a subject for my master`s thesis.

This section of my work focuses on how I acquired the data for this thesis. Hence, for me to acquire empirical materials for this master`s thesis, I used inductive research methods: “Inductive consists of going out there, `watching and wondering`, collecting information about what people say and do” (Eriksen 2010: 31).

This inductive research was carried out in Ughelli Delta State, Nigeria, in the month of August 2014. My objectives were to inquire new knowledge and data about water pollution and its health effects on the people as well as the aquatic animals. Additionally, I wanted to acquire new knowledge on how the people now adjust in the provision of drinking water from different sources of water supply in Ughelli. I was interested in the ways the people now manage not to fall ill from waterborne diseases caused by water pollution. Furthermore, I wanted to know the various perceptions of the people on the subject matter, from the perspectives of the elderly, and the youth who were born and grew up in Ughelli as well as the people presently living there. It was also important for me to know the different perceptions of experts that are concerned about the provision of water and health issues. Thus, I have chosen experts such as a doctor, a water company manager, borehole drillers, fish farmers and an employee at the UNUWBD. Finally, it was also important for me to acquire data of the historical meanings and values of water to the people of Ughelli.

Therefore, the data was collected from urban Ughelli and two peri-urban communities of Ughelli. The qualitative research involved interviews with individuals and experts as well as participant observation on the subject matter that have particular importance in this thesis. I observed how houses are constructed, the different sources of water which people use and the kind of fish that are been sold in the markets. Additionally, I also observed how the children and adults fetch water from Shell public taps and a private manual tap. During my observation at a Shell public taps and a private tap, I conducted informal interviews with both children and adults. Then I observed the ways fish are being nurtured in a fish farm as well as the ways branded water (sachet and bottled water) are produced in a water company.

In the following sections, I will first of all begin by explaining the various interview methods I used for the interviews I conducted. These include the methods I used for individual interviews, which involved elderly persons and youth that were born and raised in Ughelli. I also discuss the methodology related to expert interviews and its importance for this thesis. Secondly, I will describe the participant observation method and why the data I acquired from the observation is relevant for this thesis.

3.2. Interviews

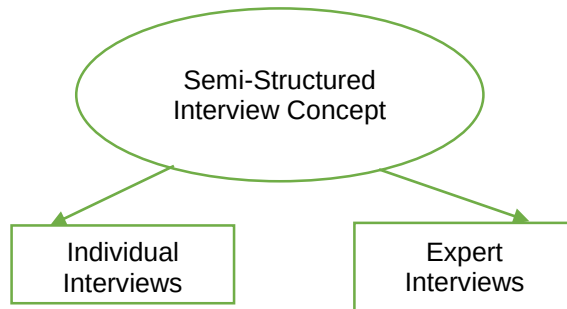


Diagram: Interview Methods, Semi-Structured interview guide

3.2.1. Semi-structured Interview Guide

For the interviews conducted with both individuals and experts, I used the concept of semi-structured interviews. This notion of semi-structured interviewing is based on the use of an interview guide, which comprises a list of questions to cover particular topics (Bernard 2011: 158). Before I carried out my ethnographic fieldwork, I wrote different lists of questions that were related to what I intended to inquire from each of the individuals and experts. The individual interviews for this thesis, includes elderly persons and members of the youth. I grouped people who are over 50 years old as elderly persons¹. The expert interview guides were prepared for fish farmers, water company managers, doctors and employees at the UNUWBD. There were general questions in the interview guide as well as questions that are selected for a particular group of experts.

However, I did not ask all the questions in the semi-structured interview guide that I used for the individuals and experts because most of the questions were previously answered in discussion. I also developed new questions based on the answers I received from each of the participants. Some of the questions I asked were not answered honestly, due to social desirability bias. For example, questions that were answered honestly by elderly persons that are very relevant for this thesis are ‘How

¹ There is one exception, a woman that neither belongs to the group of youth or elderly persons because she is above forty years. However, due to her perception about the past, I classified her in the group of elderly persons.

has water pollution affected the traditions and culture of Ughelli?’ and ‘What meanings does water have in traditions and culture of Ughelli?’ From these two questions I acquired knowledge on the importance of water to the fore-fathers of Ughelli as well as the historical and cultural use of water in daily and economic activities in Ughelli. A question that was not answered honestly was, ‘How do you respond and adapt to water pollution?’ This question was in all the semi-structured interview guidelines and it was not answered honestly from some of the persons interviewed. In regards to the sources of drinking water, the use of participant observation allowed me to verify their statements.

Languages that I have used for conducting both individual and expert interviews were Urhobo, Pidgin English and English. Urhobo is the language spoken by the Urhobo ethnic groups in Nigeria and these ethnic groups are situated in three towns of Delta state, Ughelli, Warri and Sapele. Pidgin English is an English creole spoken as a lingua franca all over Nigeria. The English language is the official language of Nigeria. Urhobo language was spoken during my interviews with elderly persons and it was sometimes mixed with English and Pidgin English. Pidgin English was used sometimes with youth and experts in some phrases to explain themselves better. However, the main language that was spoken was English.

3.2.2. Individual Interviews

As I already mentioned above, I used semi-structured interview guides to orient me with relevant themes needed for this thesis. Additionally, I used the semi-structured interview guide for my individual interviews because my ethnographic fieldwork only took one month and all the elderly persons I interviewed are elite members of Ughelli that are highly respected. Thus, interviewing these persons was important for me to acquire both historical and contemporary issues relating to water sources in Ughelli. Therefore, I had to interview twenty-one elderly persons and youths to acquire their various perceptions on water pollution as well as the historical values of water to Ughelli people.

There are no references on the historical values and meanings of water in Ughelli, which explains the relevance of interviewing these elderly persons for the thesis. Oral history relies upon the interview as its core and this is a subject with affinity to

anthropology. The aim is to “pursuing the past through the spoken word” (Henige in Skinner 2012: 14). From the individual elderly persons that I interviewed, I acquired new knowledge about the historical values and meanings of water to the forefathers of Ughelli. For example, water was the reason why the forefathers of Ughelli settled in the region. I also inquired on the cultural use of water in the daily activities and economic activities to the Ughelli people in the olden days. Finally, I acquired knowledge from the elderly about their perceptions and their awareness on water changes in contemporary times, how they have experienced these changes and how they now adjust in order to avoid falling ill from waterborne diseases.

From the individual interviews that I conducted with youths, I acquired new knowledge on their perceptions on water pollution as well as their differing awareness on water pollution. Additionally, I acquired knowledge of the different sources of drinking water, in terms of the sources of water they used before and the sources they are now drinking.

3.2.3. Expert Interviews

Just like the individual interviews, I also used the method of semi-structured interviews for the expert interviews. These dealt with ‘high-level bureaucrats’ that are ‘accustomed to efficient use of their time’ (Bernard 2011: 158). It was of importance to me to acquire new knowledge on how each of these persons (a water company manager, a doctor at the Ughelli General Hospital, two fish farmers, borehole drillers and an employee at the UNUWBD managed the issue of water pollution in their various professions.

First, interviewing a water company manager is relevant because I found out about the ‘new trend’ of water companies that have become more established in Ughelli, as a result of water pollution. Second, interviewing a doctor at the Ughelli General Hospital helped me to learn more on the effects of water pollution on the health of the people as well as develop awareness about waterborne diseases in Ughelli. Third, interviewing fish farmers was also important because I was able to acquire knowledge on another new trend in Ughelli which is fish farming. This includes new techniques for keeping fish in several artificial fish ponds according to their age and size and providing the fish with borehole water. This method entails a continuing flow of water for the fish.

Fourth, interviewing borehole drillers gave me an understanding on why all borehole water systems in Ughelli aren't safe for human consumption. Finally, interviewing an employee at the UNUWBD was relevant because I acquired new knowledge on the failure from the side of the municipal government to continue serving potable water to the people of Ughelli for more than two decades.

3.3. Participant Observation

For this thesis, I also used the method of participant observation to collect my data. This research approach “involves getting close to people and making them feel comfortable enough with your presence so that you can observe and record information about their lives” (Bernard 2011: 256). But for me, I already had contact with most of the people in Ughelli. This is because it is my region, and I was also comfortable with the people during my fieldwork. For example, I was able to visit some places unannounced and still be able to dialogue freely and easily with the people because I am a native of Ughelli, and thus, they see me as one of them. Additionally, participant observation also makes it possible for an ethnographer to acquire “field notes or extended transcripts [that] are rarely available; these would be very helpful in order to allow the reader to formulate his or her own hunches about the perspective of the people who have been studied” (Bryman in Silverman 2006: 285). In this regards, I was able to acquire information from the field notes that I took during my participant observation.

Hence, I observed different areas that are important for this thesis, which include urban Ughelli and two of Ughelli peri-urban communities and Warri central market (although the focus of this thesis remains on Ughelli itself). The following are the locations in which I practiced participant observation;

3.3.1. Observation of the Position of Cesspit, Well and Borehole Water System in old and new Houses

Observing the ways new houses and old houses are built is relevant for this thesis. Most of the old houses I observed are located at the middle of urban Ughelli, while the

new houses I observed are located in new communities in Ughelli. The reason is that most of the people I interviewed always talked about how the houses are now constructed on inadequate space between the cesspit, the well and the borehole water system. This observation helped me to investigate why most of the people in contemporary times no longer drink the water from their well and borehole water system. It also helped me to understand why old houses have their well situated in the front of their compound and the cesspit in the back of their compound.

Personally, as I was growing up in Ughelli, my mother used to tell us to fetch water only from a particular well for cooking, but then I was not aware of the reason for her advice. However, observation of this particular well allows me to have a good understanding of the reasoning now. The reason is that the well in this compound is located at the front of the compound and the cesspit in this compound is in the back of the compound. Accordingly, this compound is spacious. In other words, it seems that in previous times people had a better understanding of how to construct a compound. Another reason I observed is based on the fact that buying a land now in Ughelli is very expensive. This is in fact the reason why the people can no longer buy enough land for the building of houses. Therefore, the people are more interested in the space for the house than in the distance between cesspit and borehole.

3.3.2. Observation of Ughelli Rivers

One of the reasons for water pollution in Ughelli's streams, rivers and ponds is based on the fact that these places are now used by the people as their waste dumps. Thus, I observed some of the rivers in Ughelli and according to my observation they are all waste sites. Therefore, observing some of the rivers in Ughelli helped me to acquire new knowledge on why the people use rivers as their domestic, mechanics and factories waste dump sites. I also acquired knowledge on why there are no more fish in the streams, rivers, and ponds in Ughelli as well as why the water is no longer drinkable as it was in the olden days.

3.3.3. Observation of a Fish Farm

In Ughelli, during the olden times, two of the main occupations of the population in order to make a living, were the practices of fishing and farming. However, because of water pollution it is no longer possible for the people of Ughelli to fish naturally anymore. This is based on the fact that all the streams, rivers and ponds are now polluted from waste dumps as I mentioned above (in 2.3.2). This has influenced some people in Ughelli to start what I call the `new trend` fish farming or artificial fishery. Therefore, I visited one fish farm in one of Ughelli`s peri-urban communities. However, I have also talked to another fish farmer but I was not able to enter this area. The reason why I was unable to have access to the farm was because the farm is situated far away in the bush. Observing a fish farm enabled me to acquire knowledge on the procedures fish farmers have to take with water provision for the fish to survive since it is no longer possible for the fish to survive in their natural environment in Ughelli as it used to be.

3.3.4. Observation of Fish sold in the Market

It was also important for me to observe the different sources of fish that are now sold in the markets, based on the fact that there are no wilder fish in the Ughelli streams, rivers and ponds. On one hand, my aim was to find out more, through small talk with the fish sellers in the market, about the places where they buy their fish. On the other hand, I wished to acquire knowledge on the difference between prices of wild fish and farmed fish. Hence, during my field work I visited first Effurun Warri market and then Ughelli central market to observe the different kinds of fish that are sold in the markets, and where these fish are from as well as the price differences between wild fish and farmed fish.

3.3.5. Observation of a Private Tap Shell Public Tap and a Water Company

The main aim of this thesis is to identify how the people of Ughelli in contemporary times do provide themselves with potable water in order to stay healthy from waterborne diseases. In this sense, it was important for me to observe live experience

in the places where the people provide themselves with potable drinking water. At the same time, I wanted to carry out informal interview with the people I would meet in these places. An informal interview is part of participant observation that is more like a casual conversation. The goal of using informal interviewing concept is for the researcher to participate in naturally unfolding events, and to observe them as carefully and objectively as possible (Dewalt and DeWalt 2002:120).

Therefore, I visited a water company, a private public tap and Shell public taps. Based on what I was told by the people I interviewed, these are the main sources of potable drinking water in recent times in Ughelli. Thus, during my observation in both Shell public tap and a private tap I was able to have conversations with the children and adults I met there. Through the conversations I had with the children and adults I met in these places, I acquired new knowledge on their differing perceptions on water pollution as well as their perceptions on whether drinking water from these taps may or may not be safe for human consumption. Additionally, observing a water company also helped me to achieve a better understanding on how pure water and bottled water are produced. However, not all pure water and bottled water I drank during my fieldwork are potable drinking water². The fact about this is that some of the bottled water I drank during my field work did not taste pure because it had odour and smelled bad. For the informal interview I conducted at both public taps, I used only Pidgin English, which is the lingua franca in Nigeria.

3.4. Technique for Data Collection

3.4.1. Field Notes

As I already mentioned above (in 2.3.5), during my participant observation I did carry out informal interviews with both children and adults that I met at the two public taps in urban Ughelli. Thus, when I left, I went home and I made notes for the conversations I had with both these children and adults in my field-notebook. I did this by memorizing the conversations I had with these children and adults which I met at these places in

² The findings from a study about bottled water in Nigeria “indicate that the water produced by the 10 institutional, medium and small scale producers ought not to be in the market for public consumption” (Igbeneghu and Lamikanra 2014: 5)

my field-notebook. Field-notes according to Barnard means that a “researcher tries to remember conversations heard during the course of a day in the field. This requires constant jotting and daily sessions in which you sit.....your memory by developing field notes” (Bernard 2011: 156).

Additionally, I made field notes after I left the scene where I carried out interviews with both experts and individuals. Hence, I wrote down in my field notes the date, the age range of the persons and their occupations as well as the names of the informants I spoke with. I also made field notes of the observations that I carried out during my fieldwork.

3.4.2. Recording

For semi-structured interviews, the use of a voice recorder could be a useful, because one cannot always rely on his or her memory, except where people specifically ask you not to do that (Bernard 2011: 170). Therefore, before I started the interviews I always asked the informants for their permission to record the interviews, which they agreed to. Thus, I recorded all individuals` and experts` interviews that I conducted.

3.4.3. Photographing

During my ethnographic field work, for specific references in the pages of this thesis, I made photographs of various locations and activities that I observed. By the use of photographs according to Gregory Bateson and Margaret Mead “the wholeness of each piece of behaviour can be preserved, while the special cross-referencing desired can be obtained by placing the series on the same page” (Robben and Sluka 2012: 451). Thus, I made photographs of locations such as rivers, waste dumps, UNUWBD and a water company as well as the people I met at the public water taps. Photographs of these locations and people are necessary for me, because this does not only show how the people struggle daily with the provision of potable drinking water, but it also shows how the environment and rivers are polluted by anthropogenic activities. In this regard, I asked sometimes for permission to take photos, but in some locations I did not ask because these were public places.

3.5. Qualitative Data Analysis

For this thesis I used Atlas.ti qualitative data analysis software to organize my data analysis. Thus, I did this by uploading the various data I collected from my ethnographic findings according to the different categories into P-Docs object manager for my data analysis. The P-Docs (primary documents) is an Atlas.ti internal object for adding new primary documents to your project, in order to create names such as P1 as well as the data source for the project files. After, that I used the *Grounded Theory* approach that is *open coding* techniques and procedures from Anselm Strauss and Juliet Corbin (1998) to analyse my ethnographic findings. I was using open coding techniques and procedures concept for the labelling of phenomenon. The purpose is to create codes which are related to themes. In other words, a code is: "an abstract representation of an event, object, or action/interaction that a researcher identifies as being significant in the data" (Strauss and Corbin 1998: 103).

I started by reading through my documents as well as coding them according to related themes, such as the use of water in Ughelli both in historical and contemporary times. For both the categories of historical times and contemporary times, I created codes, quotes (codes in Vivo) and memos, after which I grouped each of the themes into different categories by using the network manager.

4. Description of the Case Study in Ughelli in Delta State, Nigeria

“The forefathers of Ughelli founded this area, [based] on the importance of water. Mostly the Urhobo people were always staying close to the river”³. This was one of the replies I obtained from the oldest man I interviewed during my field work about the importance of water in the traditions and culture of the people of Ughelli. In the olden days, water played a significant role in their lives because it was their main source of livelihood. In this sense, water was used in multiple ways and for various purposes. It was then the only natural source that they depended on for their livelihood. The region of Ughelli was surrounded with rivers, streams and ponds. The people used water not only for domestic purposes or for consumption but also used water for fishing and farming as well as carrying out their economic activities by trading on the river banks of the Ughelli central market.

This part of my thesis focuses on my ethnographic research findings in urban Ughelli and two of Ughelli's peri-urban communities in the month of August 2014. These two peri-urban communities used to be villages in the past times, but due to demographic increase, these communities are now expanded to urban Ughelli. However, there are also several other peri-urban communities in the Ughelli area beside this two. The data was collected from elderly persons and youths and experts through semi-structured interviews to discuss environmental pollution effects on water sources and its changes in Ughelli.

Information was also collected from school children and adults at two public taps to acquire knowledge on their perceptions: namely their awareness on the changes and health challenges, furthermore to acquire knowledge on why they are fetching the water from these taps as well as their awareness on waterborne diseases.

In order to understand the terms `olden times` or `in the olden days` that I use in this thesis to talk about the past, it is important for me to outline the reason why I use these terms. First, all the people whom I talked to during my field work especially elderly persons always used `olden times` or `in the olden days` to distinguish the past and the present. Secondly, Peter P. Ekeh states in the `History of the Urhobo People of Niger Delta` that the “traditional bifurcation of Urhobo historical eras made it difficult to

³ Individual interview no 14.

reconcile traditional calendar with western calendar. [Thus] the introduction of a foreign calendar into Urhobo historical accounting created some confusion in dating practices. [In other words] olden times were never segmented into separate eras in Urhobo historical practices” (2007: 10).

In this thesis, I apply such a framework for the subfields of anthropology that focus on new and re-emerging diseases from the late nineteenth century to contemporary times. Studies of infectious diseases from the middle of the last century to recent times are used in this thesis (e.g. Livingstone 1958; Cockburn 1971; Wirtsing 1985; Newson 1998; Sattenspiel 2000; Leatherman and Thomas). I also apply anthropological frameworks that engage in the struggle (Johnston 2001; Leatherman and Thomas 2001) of environmental justice in term of risk consequences like toxins waste in urban environment. I also draw on approaches and questions of historical ecology that is inspired by anthropologists (e.g. Winthrop 2001; Colten 2005) and scholars from other disciplines (e.g. Hoag 2013; Searing 1993) to analyse the importance of water to early settlers of a particular region and economy patterns. Additionally, I use political ecology theoretical frameworks (e.g. Crumley 2001; Larsen 2011) which require addressing the multiple levels, effects and intersections of policy in everyday relations as well as an agenda requiring multiple and empirical details.

Study Area and the People in Delta State

Ughelli is located in the Delta State, a southern part of Nigeria. It is located in the western part of the Niger Delta east of Warri. The people were originally fishers and farmers. Ughelli was the centre of agricultural trade such as cassava (manioc), plantains, sugarcane, palm oil and kernel.⁴ Since 1991, Ughelli has been divided into Ughelli North and South local government areas (LGA) (see 2.3, fig. 1).

The headquarters of Ughelli North is located in Ughelli town, made up of seven major clans. These include Ughelli, Orogun, Agbarha, Agbarho, Uwheru, Ewreni and Ogor each with a traditional ruler and a king called Ovie of Ughelli. Ughelli North is one of the oil producing areas of Delta State with at least 45 oil wells and an area of 1440

⁴ URL 5: Ughelli Encyclopaedia website and Ughelli South website.

square kilometres⁵. According to the census made in 2006, the population of Ughelli North from the age of 5 years and above consisted of 320,687 inhabitants⁶.

The headquarters of Ughelli South is located in Otu-Jeremi and consists of six major clans. These includes Ughievwen, Ewu, Olomu, Effurun-Otor, Okparabe and Arhavwaren. It is also one of the oil producing areas in Delta state and the Otorogun Gas Plant is one of the largest in Africa which is located at Otu-Jeremi⁷. The people of Ughelli North and South are Urhobo ethnic groups.

My fieldwork was mainly focused on the town of Ughelli North and two peri-urban communities of Ughelli.

5. The various Causes of Environmental Degradation of Water Sources in Ughelli

As Winthrop noted (2001: 206), “understanding environmental change over time is essential to assessing the current condition of landscape and to understanding how and why healthy or damaged ecosystems have involved to their current state”. Newson also stated in her conclusion that epidemics disease can only be understood by acknowledging the significance of differences in the character of parasites, the host, and the physical and social environment in which they interact over time (1998: 58). With these regards, I begin by exploring the various causes of environmental degradation that results to water depletion in Ughelli on the one hand and present environmental issues in the twenty first century on the other hand. Environmental issues in the twenty first century include resources extraction, consumption and waste, iatrogenic effects of modern technologies, high increase in toxins in the environment and new and re-emerging infectious diseases among others (Leatherman and Thomas 2001: 118).

In Ughelli, there are various causes of environmental degradation that affect water sources today. However, according to the general perception of the people, the problem started which oil companies’ toxic waste slowly degrading the environment and water sources. Examples of this include the underground and surface water as

⁵ URL 6: Ughelli North website.

⁶ Nigeria Federal Republic of Nigeria 2006 population and Housing census (p98).

⁷ URL 7: Ughelli South website.

well as rivers, streams and ponds. Thus, I will expound on the different views of the people concerning environmental problems that are affecting water sources in Ughelli. These includes toxic waste pollution from oil companies and factories, and domestic waste pollution from urban growth and lack of waste management.

5.1. Oil Companies and Factories Pollution of Water Sources

Since the beginning of oil production in the 1960s in Ughelli, chemicals and toxic pollution from oil outflows and spillages have gradually polluted water sources of urban Ughelli as well as rural communities of Ughelli North and South⁸. Thus, the majority of the people of Ughelli see this as a gradual change that has led to the distortion of farm lands, the killing of aquatic animals and the creation of unsafe water sources for humans and livestock consumption. For example, fig 2 shows a farm land that is effected by a ruptured pipeline belonging to the Nigerian Petroleum Development Company (NPDC). Furthermore, some of the people also see the pollution from oil companies as a result of demographic growth in urban Ughelli. This is based on the fact that farming and fishing used to be the main sources of livelihood of the people living in the rural communities of Ughelli.⁹ Therefore, the distortion caused by oil companies has driven the people from those areas of businesses that depended on water, forcing the people to relocate to urban Ughelli and to look for other means of livelihood.

Another aspect that affects the environment and water sources in urban Ughelli comes from factories such as Beta Glass, rubber factories and mechanic workshops and is seen as a problem by the people of Ughelli. This is because these factories and mechanics use the rivers, streams and ponds for sinking their toxic waste. Based on my observation in Ughelli, mechanic workshops are situated in residential places. It is very easy to see the pollution from toxic waste that is daily produced from repairing the cars on the ground surface. This problem can be understood from what I already mentioned above (2.1.1), that in tropical environments, human activities causing

⁸ Individual interviews from elderly persons in urban Ughelli (08.2014).

⁹ Individual interviews from both elderly persons, youths and experts (08.2014).

environmental degradation results to infectious diseases due to an inadequate water sanitation especially during rainy season, which comes with heavy precipitation.

The soil in these places is completely oily and black in colour and whenever it is raining the toxic waste from these mechanics' waste flows to water channels or it pollutes the surface water and ground water. According to some of the youths and elderly persons, they also stated that these factories (Beta Glass and two rubber factories) located in the rural communities of Ughelli do indeed use the rivers for sinking their wastes¹⁰.



Fig.2: photo of villagers weaving a boom to curtail further spread of oil in the Gbogidi River at Otughievwen in Ughelli South LGA contaminated from a ruptured pipeline belonging to the Nigerian Petroleum Development Company (NPDC).

As I already defined in my theoretical framework, the term environmental justice is derived from the links between toxins and waste in the environment (Johnston 2001). At the same time, it is a means for explaining risk and consequence of pollution in urban environments (Leatherman and Thomas 2001), which includes health risks of residual pollution of human and nonhuman species (Adeola 2009). Thus, I have

¹⁰ Individual interviews (08.2014).

explained here that oil exploration and factories toxins are a risk and consequently, one of the main causes for health problems in Ughelli. This is not only a result of distortion of farmlands and killing of aquatic animals, but also leads to unhealthy and unsafe sources of drinking water for humans and livestock consumption.

5.2. Domestic and other Causes of Pollution on the Underground Water and Rivers, Streams and Ponds

In recent years, urban Ughelli have seen severe demographic changes. The inhabitants of Ughelli rural communities have relocated to the urban area to look for new sources of livelihood since former sources of living have been distorted by oil exploration. Thus, the population of urban areas has increased rapidly, which also has contributed to domestic waste increase. However, the municipal government of Ughelli is inconsistent in its sanitary measurements to control the waste output caused by the growing population. It has also failed in taking urgent action to provide means for domestic waste disposals.¹¹ As I already described in my theoretical framework water and infectious diseases (Sattenspiel 2000), one of the problem in tropical countries like Africa, is poor sanitation and hygiene.

For example, until the early 1990s, waste management was practiced in urban Ughelli. The municipal government provided waste vans in those days that were driving around the town from street to street to take away the domestic waste from the different houses of the inhabitants¹². One of the elderly women I interviewed demonstrated the ways, especially how little children were acting, when they saw the waste van coming every Saturdays to take away the waste. Thus, she put it like this: “at a time when the town was not grown to this stage, there was one dustbin van from the council. It was moving round the town, it was not only one, in my street that time one come to us. When the dustbin van was coming you will see all the children shouting dirty motor, dirty motor [i.e. waste van] and everybody will come out with their dustbin”¹³.

However, all this has changed, for more than two decades now, there are no more waste vans in the town of Ughelli from the municipal government, but there are

¹¹ Discussion of elderly persons, youth and experts (08.2014).

¹² Individual interview of no 15 and 16.

¹³ Individual interview of no 16.

individual persons who pick up domestic waste from the people with pickup vans and locally made wheelbarrows and they get paid in return for their services. These waste pickers and the people themselves bring the domestic waste to the rivers, streams, ponds or open spaces. The only solution for the people now is to use both open spaces and rivers, streams and ponds for discarding their domestic waste in the night and sometimes during the day e.g. in the Otor-Ihwreko River. Therefore, this way of disposing domestic waste has led to the pollution of not only the underground and surface water but also rivers, streams and ponds. Thereby, making them to be stagnant and no longer flowing to other sources. Within this regard, anthropological studies on waterborne diseases assume that social factors such as humans refuse, mostly in Africa provided breeding places for vectors and pathogens that results to transmission of waterborne diseases (e.g. Livingstone 1958; Sattenspiel 2000; Inhorn and Brown 1990).

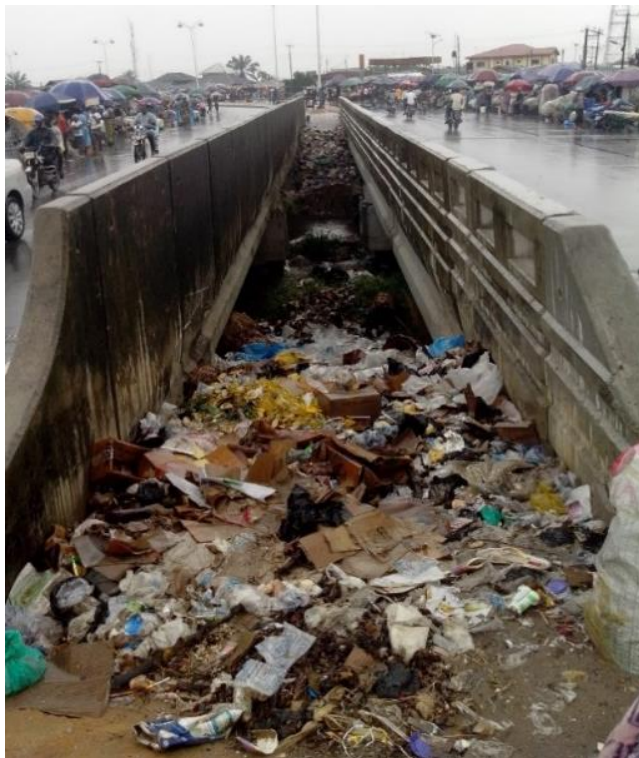


Fig.3: Contemporary Ughelli central market Otor-Ihwreko River Bridge, used by both sellers and buyers as waste disposal.

In this sense, for example, the river (in fig. 3) has played a significant role both in the cultural and economic life of the people because it was connected to other rivers in the

olden times. Then it was used by the people to travel by local canoes to other places (more about this river is discussed below). Another aspect the people also see as a general cause of water pollution in urban Ughelli is the disposal of faeces discharged from cesspits into rivers, streams and ponds¹⁴. In the near future the people are also very much afraid that waste from sachet water (below I will explain more about sachet water) could become a very big problem in urban Ughelli. Presently, everywhere you go there are empty sachet water bags littering around and they cannot decay, thus, the people fear that this will result in environmental problems that will also affect water sources¹⁵.



Fig.4: Photo of an open space close to the Ughelli North local government area used as waste disposal.

¹⁴ Individual interviews (08.2014).

¹⁵ Personal observation and individual interviews of elderly persons (08.2014).



Fig.5: Along the road empty bags of pure water in Ughelli.

Finally, a general perception of people about the causes of water pollution in urban Ughelli is the blocking of water channels by the building of houses (from individuals) and roads (built by the government) on top of water channels. Construction of roads and building of houses on top of water channels are associated with environmental change, that results to new and re-emerging infectious diseases such as waterborne diseases in anthropological studies as I explained above (see. 2.1.1.).

Contrarily to the olden days, everywhere in Ughelli town, there used to be open water channels that connected to streams and rivers. Today these problems are not only a result of rapid growth of the population, in which inhabitants of urban Ughelli build now their houses on top of water channels, but also as a result of urbanization in which roads are now constructed on top of water channels. Population growth especially in Africa today is now posing problems due to lack of plots of lands (see. 2.1.1.). In this view, it is a known fact that it is difficult for people of urban Ughelli to secure dry land in the middle of the town to own a house or a place for business. Therefore, the only option left for people who have such intentions to build a house is to buy water channels, that some people will first of all fill with waste and then with sands. Afterwards, houses are built on top of these filled water channels. Therefore, the people see this also as an environmental problem that affects water sources because

the channels are blocked and it is distorting natural and constant flow of water in the town, which eventually leads to water pollution¹⁶.

The various causes of environmental degradation, as I have described in this chapter, vary from chemicals and toxic pollution from oil exploration, factory and domestic waste pollutions results to water depletion in Ughelli. All these are associated to first anthropological subfields biological, historical, physical and political studies on new and re-emerging infectious diseases to human beings in this century. Second to biological anthropology, the focus on environmental justice that is linked to toxin waste and risk consequence to pollution in urban environment that not only effects human beings, but also aquatic life.

In the following section I will elaborate on health challenges from new and re-emerging waterborne diseases that result from the various cause of environmental degradation as I have described in this chapter. I will also give examples of how some of the people have explained their various experiences to me.

6. The Effects of Water Pollution on People and Aquatic Life

As anthropological study on infectious diseases had postulated that huge population increase in small communities may remain relatively free of diseases for a long time, because of its small size, nevertheless their lack of exposure to infections leads to a build-up of vulnerability. With this regard, when a disease is reintroduced through contact with a larger population, it is then associated with a higher level of mortality that affects not only adults, but also children (Newson 1998: 49). In most recent anthropological studies on environmental degradation, increasing population growth is seen as one of the reasons for greater risk in human health (e.g. Leatherman and Thomas 2001; Newson 1998; Sattenspiel 2000). The case of urban Ughelli increasing population which is more or less the reason for no sanitation systems as I was told by the people I interviewed. Thus, this chapter will address rapid population growth in Ughelli, as one of the reasons for new infectious diseases in Ughelli in this century. I have to repeat that the main reason for the rapid population increase in urban Ughelli is because of oil exploration distortion of farm land and aquatic life.

¹⁶ Discussion of elderly persons and youth (08.2014).

Today in Ughelli most of the health related challenges are caused by waterborne diseases. According to a doctor in the Ughelli General Hospital who I interviewed, there is statistic that one person in each of two families in Ughelli is sick from waterborne diseases every two weeks. At the same time there are new infectious diseases suffered by the people living in both rural and urban Ughelli in recent times. Furthermore, the doctor stated that in the olden times people never experienced diseases like cancer that is very common in present times¹⁷. Newson pointed out that “as human population increased and began to settle in permanent nucleated settlements, the opportunities expanded for parasites to develop as human pathogens” (1998: 49).

In those days, the forefathers of Ughelli used to drink water from different sources like rivers, ponds and locally dig-out wells without any health challenges. Unfortunately, it is no longer possible to drink these sources of water without having immediate reaction or infectious diseases. Out of all the people I interviewed, from the little children, youth and elderly persons living in Ughelli, except for two persons, the others have experienced waterborne diseases. In this regards some people have immediate reaction of cholera or diarrhoea whenever they drink bad water and also almost all of them have been sick from typhoid fever¹⁸. I have to repeat here that the reasons for these diseases are associated to environmental change as I already mentioned above.

Water as Hahn puts it “is perceived and experienced individually, but this perception is strongly influenced by social, cultural and global norms” (Hahn 2012: 29). In this respect, when I talked with the people about how they have experienced these health challenges from waterborne diseases some of the people narrated their experiences to me. For example, one of the elderly men I interviewed recounted that he had his first experience with water borne-disease in 1968...After he finished eating, he kept on visiting the toilet, and it became aware to him that same day that this was as a result of the water he drank while eating, was the reason for the problem. Since that time he only drinks boiled water¹⁹.

An elderly woman also recounted her experience to me that once she was sick and she went to the hospital where the doctor told her that she should be boiling her water

¹⁷ Explanation of expert no 6

¹⁸ Explanation from both elderly persons, youth and children (08.2014)

¹⁹ Individual interview no 11.

before drinking it, and that she was sick because of drinking polluted water²⁰. A young woman told me that she and her family experienced typhoid fever in 1996, and this was as a result of oil spill breakout in that year in one of Ughelli River (Afiesere River is a river located at one of Ughelli peri-urban communities), that many of the people of Ughelli became sick from typhoid fever, and some people died as a result of that. She told me that she and her family were taking the drugs prescribed by the doctor however, they were still sick. Thus, they finally stopped drinking their borehole water, and started drinking treated water (branded water)²¹.

Sometimes, when the people are sick they also go to the pharmacy to get treatment because they are aware that it was from the water they drank. A young woman told me that she has been sick several times from waterborne diseases like typhoid and diarrhoea and when she knows that it is from the water she goes to the pharmacy to get treatment. According to this youth she is still drinking her borehole water, because she cannot afford to boil water or to buy branded water²².

When I talked with the school children I met at two public taps in urban Ughelli about their health challenges from waterborne diseases, some of them also recounted their experiences to me²³. For example, one of the girls I met at the private manual tap told me that she in particular has experienced typhoid fever; she said that her mother took her to the pharmacy for treatment and acquired some drugs which were not effective. Afterwards, she was taken to the general hospital, where some laboratory tests were carried out. After the test it was discovered that she was sick from typhoid fever. She had to stay in the hospital for one week, where she got several vaccinations against typhoid fever²⁴.

Another boy I also talked to at this private manual tap told me that he once drank water from a well in his compound and throughout the remaining of that day he had a stomach ache and at the same time he was going to the toilet. Then his mother asked him what he ate or drank that day. He told her that he drank water from the well in their

²⁰ Individual interview no 16.

²¹ Individual interview no 17.

²² Individual interview no 7.

²³ Informal conversation no 2 and 3

²⁴ Informal conversation with a school girl in private public tap no 2.

compound, so his mother had to prepare self-medication treatment with some herbs for him and it took him one week to recover again²⁵.

In this regards of self-medication, an elderly woman also told me that whenever she is sick from waterborne diseases she sometimes goes to the hospital or she uses self-medication like oral therapy. The oral therapy according to her description was prepared by pouring boiled water into a beer bottle with a level of teaspoon measured salt and you shake it. Then you will leave it to settle and cool down before drinking it²⁶.

At the same time, environmental pollution of water sources in Ughelli also affects aquatic animals, making it impossible for the people of Ughelli to fish in the rivers, streams and ponds as they used to do it in the olden times. Even if there are cases where some fish survive in the rivers, streams and ponds, these fish still taste like chemicals when they are prepared for eating. This can be seen as a result of the contaminated water effects on the fish. As an elderly woman I interviewed stated, that once she bought a fish from along the road closed to Afiesere River. When she prepared the fish she could smell the chemical in the air. So when she finished cooking the whole soup became black and she said to herself that this is surely from the fish. Thus, she threw away the black soup, because she was aware of the consequences that she will experience when she would eat it²⁷.

In this regard, most of the people I interviewed attested that they had already experienced a situation whereby after eating such a polluted fish, they had an immediate reaction of cholera. While some people have also experienced such reaction from polluted food items that were either harvested from a polluted area or the food item was washed with polluted water in the market before it was sold. So, in such instances when the food is eaten sometimes by the whole family they have an immediate reaction of cholera²⁸.

I have described in section health problems resulting from waterborne diseases in Ughelli. These health problem in Ughelli can be used to understand anthropological contemporary studies of new and resurgent disease in this century (Newson 1998; Sattenspiel 2000; Leatherman and Thomas 2001; Kunitz 1998).

²⁵ Informal conversation with a school boy in private public tap no 2.

²⁶ Individual interview no 15.

²⁷ Individual interview no 16.

²⁸ Individuals interviews (08.2014)

Present health challenges have made the people of Ughelli to look for new ways of providing themselves and their families with potable drinking water, such as branded pure water (sachet water) and bottled water, borehole water and shell public tap and private manual taps. Also, the people look for new ways of fishing. Presently wild fish from the rivers are very expensive because they come from distant locations. Therefore, the people now turn to fish-farming as a means of livelihood, as well as, an alternative for those who cannot afford to buy wild fish from distant rivers.

In the following part of this thesis, I will focus on the different sources of drinking water and the cultural ways the people of Ughelli used water in the olden times in their daily lives, according to the perceptions of the elderly persons.

6.1. The different Sources of drinking Water and the complex Ways Water was used in Historic Times

As I have noted above (2.1.3.), historical ecological framework understands on the one hand historical landscape of places and the importance of water to first settlers of particular regions, and on the other hand addresses the changes and continuity of water sustainability today in communities. In this part of this thesis I address the different sources of drinking water and the complex ways water was used in the olden times in Ughelli.

The sources of potable drinking water in Ughelli in the olden days, both in rural and urban areas were basically from rivers, streams and ponds. As I said before, in the olden times the people's occupations were farming and fishing. Therefore, when the people were fishing and they become thirsty for water they drank water directly from where they were carrying out their fishing activity. It was also the same when they went to the farm, they drank water from either the river, stream or pond that was close to the location of their farm where they did their work. This is because the region of Ughelli was surrounded by water either by rivers, streams or ponds, unlike in the present days where most of the rivers, streams and ponds are now blocked with houses and roads as I mentioned above²⁹ (see. 5.2.).

²⁹ Explanation from elderly persons (08.2014).

They had another source of drinking and cooking water at home in the olden days. At home they mainly fetched their drinking and cooking water from locally dig-out wells built with mud. Although according to the elderly persons I talked to, water from the wells was not pure in colour because of the mud that was used for building the well. However, they were never sick from drinking the water³⁰.

Furthermore, they were not drinking the water from the wells directly because they had a cultural way of treating the water in those days before drinking it. As an elderly man put it “in those days when the people in this community have not started experiencing pollution of water they had a cultural treatment of water that gave the water a pleasant taste or a good taste”. Thus, the preparation for the treatment to give the water a good and pleasant taste was made by placing the native pot made of clay on top of a fire. After a while the smoke from the fire makes the native pot to heat. As soon as the pot was smoked and hot enough, it was dug in the ground and finally water was poured into it. “So the beauty of that water is that it has the kind of a taste arising from the smoked earth”. Therefore, in every house they had a big native pot placed in the front of the house where the family members individually took their drinking water from. But today, due to industrialization and environmental degradation the people no longer practice this cultural treatment of water. However, as I was told this cultural way of treating water is still carried out in some rural communities in Ughelli where they have no other sources of water treatment³¹.

As time went on in urban Ughelli, new ways of building wells came into existence. I will call the new wells modern wells, those were the ones I grew up to see. In figure 6 and 7 below are examples of the modern wells that are found in urban Ughelli today. The modern wells are built with rings made with cements and they are sold in shops where building materials are sold. House owners who wanted to have such wells in their compounds by the rings according to the depth of the well they intended to have. Some modern wells are also covered with a steel cover, because sometimes children go there to play. In order to avoid the children from throwing dirt into the well some people do cover their wells.

I also drank water from the modern well as I was growing up in Ughelli, especially a well that was close to the house where I lived, but it was not all the time, and we were

³⁰ Individual interviews of no 11 and 16.

³¹ Explanation from an elderly man no 12.

also using the water for cooking. The water from modern wells is pure in colour, but today the people have much awareness about waterborne diseases therefore they do not longer drink water from modern wells³².

In the olden days, the people also used rivers and streams as their laundries where they washed their clothes. Thus, they took their clothes to the banks of either the rivers or streams that were not far from where they resided to wash them, after that they took their bath before going back home. They also paddled their locally made canoes to other places in those days. I will discuss more on this aspect in a separate chapter below³³.



Fig. 6: An open modern well in urban Ughelli

³² Personal reflection.

³³ Explanation from elderly persons (08.2014).

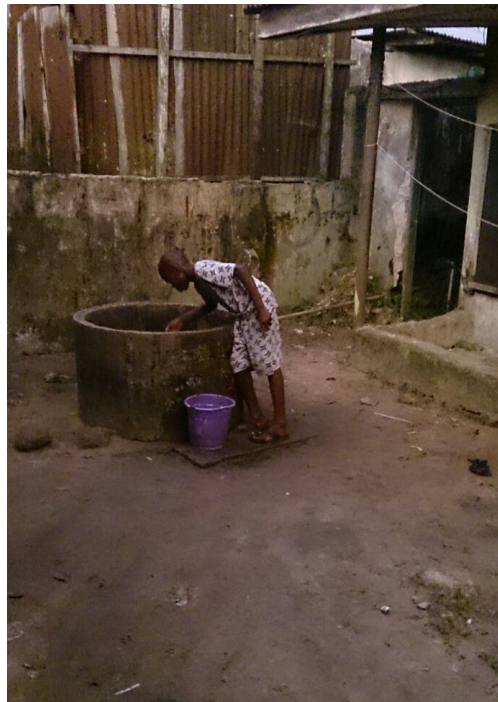


Fig.7: modern well with a covered in urban Ughelli.

I have used historical ecological framework in this part of this thesis to address the importance of water to forefather of Ughelli. Thus, I have described the different sources of water drank by the people of Ughelli in the olden days. Furthermore, I used historical ecological framework that addresses changes and continuity of water sustainability (e.g. Nilsson 2006), to explain the different sources of water as well as the traditional way water was treated before drinking in Ughelli. All these include river, ponds, streams and water from wells.

In present days because pollution the people are now aware of health challenges that can result from drinking water from either rivers, streams or ponds as they were used to. Therefore, the people of Ughelli as well as the whole of Nigeria have discovered new ideas of providing themselves and their families with potable drinking water. In the following, I expound on the new sources of potable drinking water the people of urban Ughelli drink in present days.

6.2. The different Sources of drinking Water in Contemporary Times

Political ecological notions of human environment interaction support biocultural research that addresses issues like environmental risk in urban settings and problems of new and resurgent infectious diseases. Within this regards, anthropologists “expect a diversity of creative adaptive strategies, which range from systematic adjustment to transformation, from resistance to revolution” (Leatherman and Thomas 2001: 119).

Presently, in Ughelli there are different sources of drinking water, however, not all of the water sources are good for human consumption, either it has colour, odour or the ph. level (indicator for acidity and alkalinity) is too low or too high. Thus, today there are different ways water in Ughelli is treated for human consumption.

In order for the people to preserve their own and their children`s health from waterborne diseases they now have new ways to circumvent traditional ways of drinking water directly from rivers, streams, ponds and wells. Presently, drinking water from those sources have an immediate effect on the health of the people. Therefore, the people are now aware of health implications, thus, they turn to new sources of potable drinking water. However, some people are still ignorant of such effects, because not everybody can really afford to go to the hospital to know the reasons for his or her sickness as well as not everybody can afford to provide himself or herself and his family with potable drinking water.

There are three differences (levels) in the income status of the people of Ughelli. I will group them into high income class, average income class and low income class. There are also three different sources of potable drinking water in urban Ughelli with different qualities

1. Branded water: this includes sachet water (popularly called by the people pure water) and bottled water.
2. Borehole water system: water from home-made water tanks.
3. Water from Shell public water taps and private manual water taps (provided by rich persons to the public).

Branded Water

Branded water in bottles has been in circulation for a very long time in Nigeria. Reflecting on branded water as I was growing up in Ughelli, there were only two brands of bottled water sold then (Eva and Ragolis water), these two brands are still sold only in bottles in present times. During this time, Eva and Ragolis bottled water were normally consumed by foreigners who came to work either in oil companies or other factories in Ughelli. There were also some individually rich persons who were drinking bottled water then³⁴.

In 1993, as an economic strategy, the people all over Nigeria started fetching water from taps or wells after which it was poured into small transparent plastic bags, then cooling it to sell it either in the market places, public places or on highways. As time goes on, in the middle of the 1990s new local technics came into place for producing sachet water without label or a particular treatment of the water.

Then sachet water at this time was not drank at home, it was drank outside in social gatherings and ceremonies like marriages, funerals, inter-house sports and church activities etc.

However, from the early 21st century on, people started being more aware on their health issues regarding the quality of drinking water. Additionally, the government National Agency for Food and Drug Administration Control (NAFDAC) started checking the quality of the sachet water as well as making it compulsory for the people producing this sachet water to register it with a label. This became the beginning of new technologies for the production of branded water. During this time the demand for branded water became high and this influenced the people everywhere in Nigeria to establish new water companies³⁵.

Until 2007 before I relocated to Austria, there were about two to three water companies in Ughelli, surprisingly, during my fieldwork I observed more than eight water companies in Ughelli.

The majority of pure water in Ughelli or the whole of Nigeria are just packaged water as an elderly woman put it, that “they are not clean they are not purified, there was a time I carried one packaged water, when you see the smell that was coming out of the

³⁴ My personal observation.

³⁵ Individual interviews of elderly persons, experts and youths (08.2014)

water, they say it is pure water. I carried it, the bag was sold to me for 80 naira and I could not drink it. So, when the man that brought the packaged water came later after two days, I asked him to check the water. Behold when the man opened the water [sachet water], he tasted it and he said madam did you take this water? I said I just took it and spat it out, he said it is not good for drinking, and he said I don't know how it manage to enter my truck³⁶.

The people come across such experience every day, but because they have no other alternative they still buy this sachet water especially when on their way travelling and they are thirsty unlike in the case of this woman. In another aspect (interview), an elderly woman told me that she only buys water from two companies in Ughelli, for her they are the best quality drinking branded water.



Fig.8: Branded water sachet water, popularly called by the people pure water and a bottle water the two are from two different companies.

The majority of the people who belong to the group of average income class presently are not only drinking sachet water outside when they are thirsty, but they also drink sachet water at home. Thus, water companies have trucks distributing bags of sachet water and packages of bottled water to shop owners who in return sell it to people living in the neighbourhood. In other cases, they also deliver water to the people's home in Ughelli. A bag of sachet water contains twenty sachets, the people then buy these bags home to drink after meals and whenever they are thirsty. However, the people

³⁶ Individual interview no 10.

stated that not all the sachet water is as pure as it is said to be. The same is true for bottled water. During my fieldwork some of the bottled water I drank was not natural and was also smelling bad and had a foul taste.



Fig. 9: water tanks and purify machines in a water company in one of Ughelli`s peri-urban communities.

The equipment and criteria needed for the production of branded water as I was told by an expert in a water company in one of Ughelli`s peri-urban communities are as follows:

1. A water company should be far from places like poultry environment and cesspit.
2. The borehole has to be more than two hundred feet, it is important because it reduces the pollutions that are in the environment from the water especially sewage.
3. A borehole pumping machine for producing branded water must have a submersible pumping machine that will clean the dirt from the water.
4. The water tank has to have a sand-dirt-filter that will trap any dirt particle from the water before it flows to the treatment chamber.
5. The treatment chambers are also important for the purification of the water and it contains two things hydrolyte and activated carbon-filter. The hydrolyte takes care of the odour, taste and colour of water (the three components of water). Then the activated carbon-filter balances the PH of the water which supposed to be between 6.5 and 8.5ph³⁷.

³⁷ Expert interview no1.

In other words, all these criteria and equipment are very important for the production of branded water to make the pH level that is the alkaline and acid in the water to be balanced for human consumption.

The Increase of Price for Sachet Water

In Nigeria, the price of a sachet of water has become very expensive for those who depend on it. According to what people were saying during my fieldwork, a sachet of water is sold for 10 naira (about 2 cent) in Warri. In other places like Bayelsa State or Cross Rivers State, a sachet of water is sold for 20 naira (about 4 cent). In present times, especially in many places in the riverine areas of Niger Delta, it is very hard for the people to have access to potable drinking water. Thus, many water companies from Ughelli bring sachet water to those places to sell.

While in Ughelli, during my fieldwork a sachet of water was still sold for 5 naira (about 1 cent). The water companies in Ughelli held a meeting in 2013 because they wanted to increase the price up to 10 naira as it is sold in Warri. In this sense, I also heard people saying that since 2013 a court case is pending between a water company and several other water companies because of the increase of sachet water price. However, a water company refused to this agreement. The owner of this company stated to be satisfied with the existing price. For him he has enough profit with the sales of a sachet water for 5 naira.

Therefore, the other companies started to sell their own water for 10 naira, while the opposing company remained selling his own sachet water for 5 naira, as a result of which people stopped buying other companies water which led to loss of sales. Based on this, the other companies came together and sued the opposing water company in court and during the time of my research the case was still pending. Therefore, while the case was still pending in court all other water companies had to reduce their price to 5 naira again³⁸. An elderly man who I interviewed stated that the government will have to put an end to this problem, otherwise in the nearest future people will only have to work to afford drinking water³⁹.

³⁸ Observation in fieldwork.

³⁹ Individual interview no 13.

Borehole Water System

In contrast to the times when the people had wells in their compounds, today almost every newly built house in Ughelli town has a borehole water system that supplies the people with water. However, in some residences not all borehole water systems provide good drinking water. First, in Ughelli town, the soil formation such as the topography or geological formation contains iron⁴⁰. Second, there are other pollutants in the surface water such as the ones from oil pollution and other pollution as I have already listed above.

Finally, most of the newly built houses in urban Ughelli are built in a tight space, thus, the borehole water system and cesspit are near to each other. Normally, according to borehole drillers, a borehole water system should be 200 meters away from cesspits.



Fig.10: This is the way a private water tank looks like.

⁴⁰ Explanation of borehole drillers (08.2014).



Fig.11: The picture shows that the cesspit and the tank are too close.

As I mentioned above (see. 2.1.1.), population growth in Africa results in a lack plots of lands for building water systems or wells for household use, which is normally recommended to be at least 30m from latrine. But because it has become difficult to acquire land and it has also become very expensive to acquire spacious land in Ughelli, the people are now more interested in the space for the house than for the distance between cesspits and borehole water system. This is also seen as a reason for waterborne diseases.

Thus, to get a borehole water system installed that will deliver potable drinking water in Ughelli, the depth has to be drilled below a minimum of 150 to 180 feet to acquire good potable drinking water, which is too expensive for many people. In this regard, not everybody has the financial abilities to drill below 150 to 180 feet (about 50m to 60m) that costs about 300 to 250 thousand naira (above 1000 euro). The only option left for the majority of the people is just to drill a borehole water system that they can afford to pay for, thus, several borehole water systems in Ughelli town are not more than 60 to 80 feet (about 20m to 26m). The cost for such a borehole water system is about 60 to 80 thousand naira (300 to 400 euro).

Some people connect small sand dirt-filter, (see Branded Water, criteria and equipment), that will extract the dirt from the water before it flows into the pipe that supplies water in the house⁴¹.

⁴¹ Explanation of borehole drillers (08.2014).

At the same time, older houses that are renovated also install today a borehole water system in their compound and these older houses are mainly located in the middle of the town with enough space. Furthermore, these houses normally have their wells in the front of the compound and the cesspits in the back of the compound. The owners of such houses also install their borehole in front and the cesspit in the back. There are also people who can afford to acquire enough space with enough financial means to pay for a borehole water system to get good quality water. Borehole water systems with a potable drinking water are owned only by the high income class group in Ughelli.

Shell Water Tap and Private Manual Taps

When I was in primary school (Oharisi model primary school Ughelli) from the late 1980s to early 1990s I can still remember that each class had a plastic bucket of water and plastic cups placed in front of the class, so that when we are thirsty we can drink water from there. During these times we go to the Shell water tap to fetch the water. The Shell water tap belongs to the Shell Oil Company that is located in Isoko road in the middle of Ughelli town. In front of the Shell head quarter, there has been a public water tap since the 1980s. Not far from there are two primary schools and one secondary school and I attended one of these primary schools. Furthermore, unlike today where the Shell taps have normal taps that you can open and close, then they had a manual tap that you have to pump.

Today, according to the people in Ughelli, Shell water is the best potable drinking water in the town because the water is treated and they also have a big reservoir that supplies the taps. Both the people living close to this place and other people who come from far go to the Shell taps to fetch their drinking water. During my fieldwork, in order for me to experience everyday situations of how people provide themselves with water and get to know why they also think that this water is good for drinking I had to visit Shell public tap. There I met both children and adults who are working and living in the neighbourhood as well as people who came with *okada* (i.e. commercial motorcycle) and their cars to fetch water. The adult and children living as well as workers and sellers who have their shops next to the taps came with their buckets and jerry cans, while people who came from far with their cars or *okada* only with jerry cans.

Therefore, I had to make a small talk with the people I met there about their perceptions why they are fetching this water. From the conversations I had with both children and adults who I met at the Shell public tap, I acquired the following information. They all have in their homes and workplaces either a borehole water system or a well, however, they do not drink the water from those sources. In this sense, they only use it for washing clothes and plates as well as for taking their bath. When I got there I first of all talked to a woman who told me that the water is the cleanest water in town and that is why she fetches it for drinking, although there is a borehole in her compound.

Then she said that if I wait I will see people coming with their cars and *okada* to fetch water there.

Furthermore, I also asked those people who came with their cars or *okada*, why they drove far to fetch this water instead of buying sachet water. In reply to my question, a young man who came with his car told me that the water is fresh and he prefers to drink fresh water instead of drinking packaged water. He said as far as he was concerned, all the packaged water sold in Ughelli town do not have the quality of this water. For him, instead of spending his money to buy such packaged water, he would rather buy fuel in his car and drive here every day to fetch water for his family⁴².

⁴² Observation and informal interview no 4.

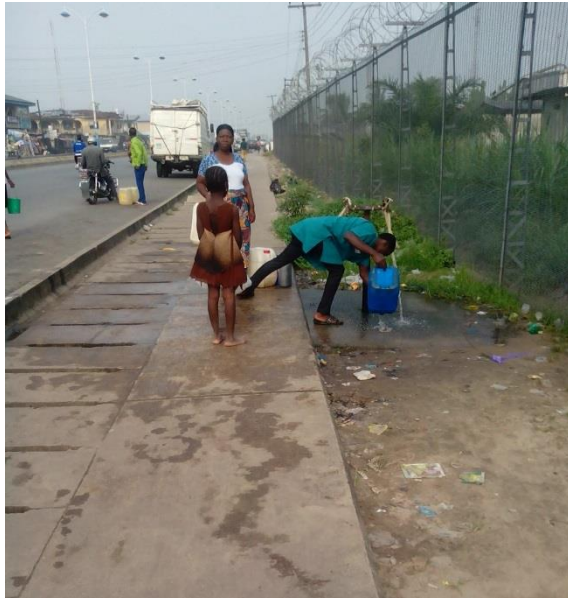


Fig. 12: Shell public water tap in Isoko road the middle of Ughelli town.

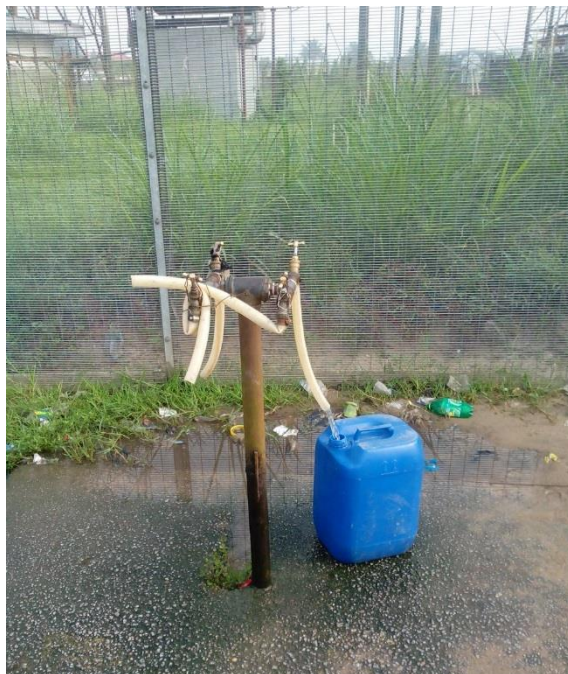


Fig.13: Shell public tap in Isoko road the middle of Ughelli town

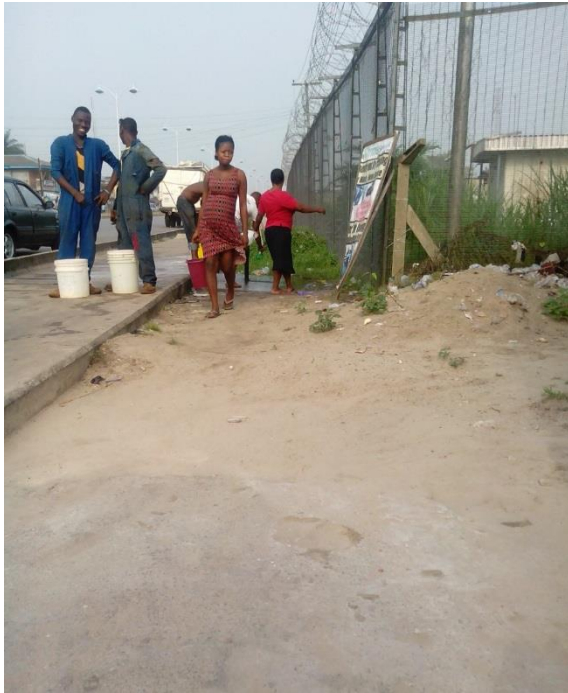


Fig.14: Shell public tap in Isoko road the middle of Ughelli town

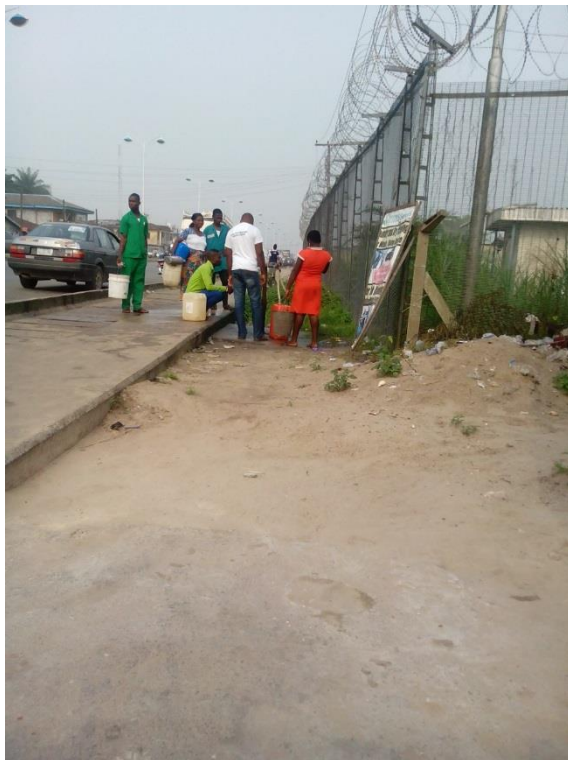


Fig.15: Shell public tap in Isoko road the middle of Ughelli town

In some streets in Ughelli town there are private manual taps, installed by high-income persons for those low income people who cannot provide potable drinking water for themselves and their families. The same day I visited Shell public water tap I also visited a private manual tap. In comparison with the Shell public water tap there were only school children who came there with their younger siblings to fetch water with their jerry cans, plastic buckets and wheelbarrows to carry the water. The children who came to fetch water at this private manual tap stay in nearby streets and they had to come two to three times to fetch water. At home they have a big drum (a water barrel) where they fetch the water to drink whenever anyone is thirsty at home. In their homes they also have either wells or borehole water systems, but they do not drink the water from these sources, to avoid waterborne diseases.



Fig.16. A private manual tap at No. 7 Onovaye Street in Ughelli town with school waiting to fetch drinking water.

Though the majority of the people in urban Ughelli have new ways to provide themselves with potable drinking water. Generally, the people think it is the

responsibility of the government to provide potable drinking water for the masses since the main distortion of water sources in Ughelli comes from the oil companies. This is the reason why the UNUWBD was set up. But the UNUWBD has not been functioning for more than two decades now. Additionally, I think the problem remains unsolved because the differences of income amongst the people. Water, as one of the elderly man puts it, is supposed to be a free gift of nature for every human being but now water has become a commodity for the survival of the fittest⁴³.

In this section I have used anthropological framework that expect a diversity of creative adaptive strategies like systematic adjustment and transformation, and resistance and revolution because of environmental risk in urban settings and problems of new and resurgent infectious diseases (Leatherman and Thomas 2001). Thus I explored in this section the different sources of potable drinking water in Ughelli (sachet and bottled, water borehole water system and water from Shell public water taps and private manual water taps), and the different perception of the people about these sources of water.

In the following chapter, I will describe changes in the use of water in economic activities in the olden times and today in Ughelli. Therefore, I first of all expound on the Otor-Ihwreko river banks in Ughelli central market that is since the olden days until today the main market and trade centre in Ughelli town. Then, I will expound on sources of fish in Ughelli in the olden times. That is, where the fish came from, as well as, the different perceptions of elderly persons on cultural management in dealing with fish. Second, I will describe sources of fish in present time in Ughelli. Thus, I start by discussing the different sources of fish sold in the markets (Warri and Ughelli) which are farmed fish and wild fish. Afterwards, I will expound more on the farmed fish which is now a new trend of fishing in Ughelli. Finally, I also expound on the conflict and serious problems arising in present time on fishing as a consequence of water pollution.

⁴³ Individual interview no 13.

7. Changes in the Use of Water in Economic Activities in the olden Times and today in Ughelli

7.1. The Otor-Ihwreko River in Ughelli Central Market in Historic Times and today

As James M. Acheson notes (Sauer 1963), that it was argued before the advent of agriculture, the sea provided human beings with `continuous` and inexhaustible supply of food (1981:276). In the case of Ughelli people, Otor-Ihwreko River in the olden times played a significant role in the economic life of the people. In order for a better understanding of water depletion in Otor-Ihwreko River in contemporary times, it is also important to understand the significance role the Otor-Ihwreko River played in the life of people before now. According to Kathryn R. Winthrop "patterns of economy and belief are especially significant role in guiding human action with regard to the environment. Human beings, like any other species on earth, must obtain their material needs from the natural environment and the economy of any society is the way to meet those material needs" (2001: 206). With this regard, I want to focus in this chapter, water as a patterns of economy in Ughelli to talk about anthropological approach in history of environmental change.

One of the oldest communities in Ughelli town today is the Otor-Ihwreko community, it is located in the middle of the town. The Otor-Ihwreko is the main centre for commercial trade in Ughelli town. The central market of Ughelli is also situated in this community and in the streets of its neighbourhood are more shops than family houses. The reason is because the largest river in Ughelli town is located in the Otor-Ihwreko community. Therefore, in the olden days, the people used the two sides of the river banks as the main trade centre in Ughelli. Thus, people came from far and near to do trade by barter (i.e. exchange of goods with another that have the same worth) on both side of the river banks.

According to elderly persons in Ughelli, the Otor-Ihwreko river banks played an important role in their socioeconomic interactions with other ethnic groups who came with their canoes in the olden days to exchange goods with them. Until Nigerian`s independence in 1960, the people of Ughelli living in urban and rural areas of Ughelli,

and neighbouring ethnic groups came with their canoes to the Otor-Ihwreko river banks to trade their goods by barter.⁴⁴

Hence, an elderly man stated that the Otor-Ihwreko river banks were big and wide in space. Additionally, the only ways of transportation was by river in the olden times, especially distant travels, based on fact that the people of Ughelli were travelling with their locally made canoes to other neighbouring communities and also, people from other neighbouring ethnic communities travelled to Ughelli with their canoes⁴⁵.

Therefore, in those days the Ughelli people living in rural areas and the metropolis went with their goods to the market. Even neighbouring ethnic groups (e.g. Ijaw ethnic groups) came to the Otor-Ihwreko river banks to trade their goods by barter. During this period, different goods were traded on the market banks such as garri, tapioca and starch (both from Cassava source), sugarcane, fish, mats and many other goods.

As I was told, the Ijaw ethnic group brought fish in those days, while the Ughelli people brought not just fish but also they brought garri and tapioca, sugarcanes, mats etc. Consequently, the people were exchanging goods equivalent to what they brought. As a result of the connections between the rivers in the olden days, they were able to interact with one another by trading.

Some of the elderly persons also stated that in the olden times, two days of the week were dedicated for the people to go the market to trade their goods. The first day is called *Edeki-ode* (big market day), while the second day is called *Edeki-ekuigbo* (small market day). The people of Ughelli made these two market days traditional custom by not performing any other activities such as, going to farm or fishing as well as not celebrating any form of ceremonies, like marriage, birthday, or funerals⁴⁶.

Today, the market is open every day unlike before where it was only open two days in a week nevertheless these two days are still observed according to the tradition. However, people still come from far and near either to sell their goods or buy whatever they need for upkeep. Since in the early 1980s, a bridge has been constructed to connect both sides of the river banks in order for people to easily go through it by feet to both sides of market. Additionally, in both sides of the banks are two markets with

⁴⁴ Individual interviews of elderly persons (08.2014)

⁴⁵ Individual interview no 14.

⁴⁶ Individual interviews of elderly persons (08.2014).

shops, in one of these sides is the market for food items while on the other side is the market for house materials.

Up until this contemporary times, this marketplace is the central market of Ughelli. Although, the government has built a new market but the people refused to move to this new market. In contemporary times, the river has become a place where market sellers and buyers dispose their waste (see fig.3).

Anthropological approach on history of environmental change answers questions of “How did we get where we are today?” (Winthrop 2001: 205-206). As I have shown here, the case of Otor-Ihwreko River, can be used to understand patterns of the economy of a society and how it changes over time. At the same time, there are also other changes of material needs relating to water sources that have changed, these includes economic patterns of fishing. Next, I will talk about how fishing was conducted out in the olden days in Ughelli and then how this has all changed.

7.2. Sources of Fish in Historic Times

Fishing in the olden times were carried out by the people living both in urban and rural communities in Ughelli rivers, streams and ponds. As I already mentioned above (in 6.1), the main occupations of the Ughelli people were fishing and farming, thus, in the past when the people went fishing they came home with enough fish for the whole family. When I interviewed the elderly persons in Ughelli about how they have experienced environmental pollution effects of water sources in Ughelli, they told me how they were able to fish in the rivers, streams and ponds in the olden days which is no longer possible now.⁴⁷

The oldest man I interviewed lives very close the Otor-Ihwreko River where Ughelli central market is situated. He said that when he was young he used to go fishing in the Otor-Ihwreko River and that there were enough fish in the river. He said the water used to flow constantly unlike today where the water is no longer deep. He also said that the high level of chemicals in the river today which has affected the survival of fish was not there in those days.⁴⁸

⁴⁷ Individual interview of elderly persons (08.2014).

⁴⁸ Individual interview no 14.

Neighbouring ethnic groups e.g. the Ijaw ethnic groups came to Ughelli in the olden days with their fish to exchange it with agricultural produce with farmers in the banks of Otor-Ihwreko River. The only occupations of the Ijaw ethnic groups in Niger Delta in the olden times was fishing because they do not have dry land for farming. So, they bring fish to exchange agricultural produce in the Otor-Ihwreko river banks⁴⁹.

The fish the people were eating in the olden days were only wild fish, either they caught the fish themselves or they got it through exchange from fishers who needed agricultural produce⁵⁰. As I was told by one of the elderly women I interviewed, when she was a girl, she usually carried garri (Cassava flour) for her grandmother to the market to exchange it with fish from the Ijaw fishermen which was mutually beneficial⁵¹.

7.3. Sources of Fish in Contemporary Times

During my fieldwork, I visited two markets with my mother to observe the different kinds of fish that are being sold there. First, I visited a market in Warri (Effurun market), which is also situated close to a river bank. Fish sold in this market were from different species, however, both wild fish and farmed fish are very similar in nature. Therefore, I went first to a woman who sells farmed fish and I asked her the kind of fish she was selling and in response she told me that she is selling farmed fish. Then, she made reference to my mother by saying, mama knows the difference between farmed fish and wild fish. After my mother negotiated with the seller for about five minutes, we bought two fish from her. She was very happy with us because we patronized her by buying two fish from her after I did an informal interview with her.

Nigerian markets do not have fixed prices goods especially for food items. They usually bargain to negotiate prices for goods. In this case, the seller first of all name a particular price, and then the buyer name his/her price and in return the seller name another price, till the seller or the buyer are satisfied with the price and then the buyer pays for it. At the same time, if the buyer is not satisfied with the price he/she can also leave without buying the particular item.

⁴⁹ Individual interview of elderly persons (08.2014).

⁵⁰ Explanation of elderly persons (08.2014).

⁵¹ Individual interview no16.

In this market, I went to another fish seller. This time around it was a wild fish seller and I left my mother to negotiate price with the seller after I had selected my choice of fish. Then my mother asked the seller for the cost of the fish and she named the price of the fish which happens to be too expensive and my mother in return named her own price which was much lower to the price the seller named. As a result of this, the fish seller became very angry saying that she was not selling farmed fish but wild fish and as such the price my mother named could only buy farmed fish.

We left this seller to another wild fish seller because of the high price she placed on her fish. My mother also negotiated the price of the fish with her and it was a bit lower than the previous price and she eventually bought one of it. When my mother was negotiating the price with this seller, I used the opportunity to have a small talk with her in order to inquire information about where she buys her fish from. In response to my questions, she told me that she buys fish sometimes from Itsekiri villages or Ijaw villages.

Between the fish I wanted to buy from the first wild fish seller and second wild fish seller there was a little price difference. I bought the wild fish from the second seller because she was more polite during our negotiation, and moreover her fish was more affordable.

In the Otor-Ihwreko market in Ughelli, there were also both farmed fish and wild fish. However, in Warri market the numbers of people selling farmed fish and those selling wild fish are equal, while the Otor-Ihwreko market had more sellers who sold farmed fish compared to those selling wild fish. At the same time, the wild fish sold in Otor-Ihwreko market are much more expensive than the ones sold in the Effurun-Warri market. I also bought wild fish and farmed fish from the Otor-Ihwreko market in Ughelli.

In these two markets it was difficult for me to differentiate wild fish from farmed fish because they looked very similar in nature but it was easier for my mother to differentiate them. However, I was able to know the differences from their taste, because the wild fish tasted more delicious than the farmed fish.

I try here to discuss how environmental pollution affects the water sources and the prices of farmed fish and wild fish in the market. The people no longer attach so much importance to the quality of fish but rather it's availability for consumption. This approach can be used in biological anthropology to understand the environment as a

principle for organising features of human adaptation and social conditions (see. 2.1.1.).

In order for me to observe the new technology that is now used to keep farmed fish, I visited a fish farm in one of Ughelli's peri-urban communities and I also talked with another fish farmer. In the following section I will describe the new trend of fish farming in Ughelli, according to my observation and the information I obtained from the two fish farmers I talked with during my field work.

New Trend of Fish farming in Ughelli

Just as the people of Ughelli have found new ways of providing themselves and their families' with new sources of potable drinking in contemporary times. The people have also developed an alternative way of fishing. During my fieldwork, I heard many people talking about how profitable it is to go into such business in present times. At the same time, I was also interested to know how a fish farm is functioning with the provision of water.

To observe how the fish farmers who are into the new trend do provide water for the fish, I visited a fish farm in one of Ughelli peri-urban communities. The farm is located about 6 kilometres away from where the inhabitants of the community live. In the surrounding of this fish farm, there is a plantain plantation. The farm has a pond with natural water and additional three artificial ponds, a borehole water system and an electricity generator. As I was told by the fish farmer, just as flowing water is necessary for the survival of the fish in their natural environment, so is flowing water also necessary for the survival of fish in a farm⁵².

So, the fish farmer told me that, the water for artificial ponds has to be changed from time to time, because the fish needs fresh water to survive and if the water is always static the fish are going to be affected. In this regard, the three artificial ponds have an embankment that supplies water from a borehole water system in the form of a flowing stream⁵³.

⁵² Observation no 8.

⁵³ Expert interview no 2.

The first pond is a small pond which is a round plastic pool and it is placed in a concrete foundation which is covered with a roof with open sides. In this artificial pond are 20 thousand newly hatched fish with a pipe from the borehole water system that supplies water continuously into this pond. Also connected to the ground of this pond is a small pipe with a filter where the water has to flow out. The second artificial pond is constructed with tiles on the walls and on the floor and a roof above it. The pond also has a pipe that supplies the water and another one where the water flows out. The fish kept in the pond are finger length.

The third artificial pond is made with cemented blocks and also with a roof above it and a pipe that supplies it with water. Inside this pond are different sizes of fish from a month old to three months. The fish in the third pond are later transferred to the natural pond after three months.

The water in the natural pond is natural flowing water. I asked the fish farmer if the water is not polluted and he told me that before he started using this water he took a small amount to the lab for testing and the result shows that the water is good for keeping these fish because the water in the natural pond is hardly polluted like other ponds.

He also told me that when he first started with the fish farm all the fish died because the water he used then was not good for the fish. According to him, he had no marine education about fish farming and this was the reason why he had such a terrible experience⁵⁴. The owner of the other fish farm I talked to told me that they once had a situation where the water in two of their artificial ponds was polluted and all the fish in these ponds died. Therefore, he puts it this way: “the effects of polluted water on ponds, generally is that if the water is not clean it affects the fish. At the end of the day, you will find out that the growth will be retarded or sometimes we lose some of them”⁵⁵.

⁵⁴ Expert interview no 2.

⁵⁵ Expert interview no 1.

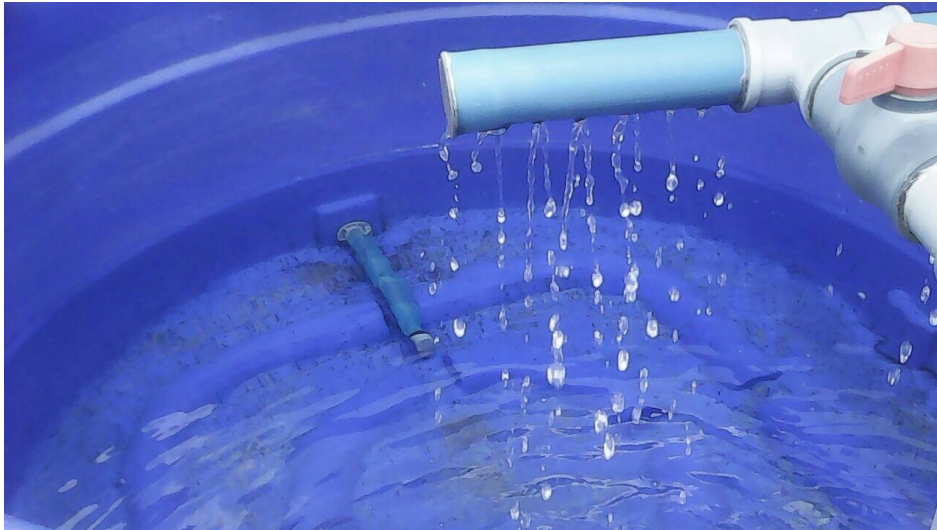


Fig.17: Newly hatched fish in an artificial pond with a pipe flowing from a borehole water system, in the form of a flowing stream.



Fig. 18: A pond with finger size fish in a fish farm.



Fig.19: A pond with average size fish in a fish farm.



Fig.20: Natural pond in a fish farm.

The following are necessary requirements for a fish farmer.

1. The farmer must have marine education or has to
2. Employ someone with marine education.
3. The water used for nurturing the fish must be taken to the laboratory first and,
4. A fish farm must be far away from where human beings are living⁵⁶.

As I mentioned above (see. 6.2.), because of present concerns in environmental risk anthropologists `expert a diversity of creative adaptive strategies`, as I have explained, not only human beings are affected from water depletion, but also aquatic life. Therefore, I have shown here creative adaptive strategies the people of Ughelli now use in contemporary times.

Fishing Conflict

As I already cited in my introduction farmers and fishermen are displaced from occupation for a very long time, before the polluted land or rivers/creeks are restored to the origin state. In recent times, there have been several conflicts between fishermen who did relocate from the Niger Delta to other places because of the effects of water

⁵⁶ Expert Interviews of Fish farmers (08.2014).

pollution and those local fishermen in those places where there is no pollution problem affecting aquatic animals.

Thus, as I was also told by an elderly man I interviewed, he explained that because of the problem of water pollution in the Niger Delta several fishermen relocated to those areas where there are fish in the rivers. Thus, he gave an example of a village called Modakeke in Ife state in the western part of Nigeria. There was a conflict where fishermen from the Niger Delta were killed by the fishermen of the village of Modakeke⁵⁷.

This case shows in a drastic way how water pollution is affecting the migration of fishermen to other places and how environmental problems are responsible in arising territorial conflicts. Many people have been affected because of water pollution in Nigeria, either directly or indirectly and such a conflict can be seen as indirect effect. But in Ughelli, unlike other places in the Niger Delta including Warri where several militant movements have emerged since the last 20 years, so far no such conflicts did arise.

In the next section, I will expound on the meanings and values attributed to water in the olden days and today.

⁵⁷ Individual interview no 13.

8. Meanings and Values of Water in Historic Times compared to today

When I visited elderly persons in their homes during my fieldwork after introducing myself and my aim of the visit using my language Urhobo, telling that I want to inquire knowledge about the changes that have transpired with *ame* (i.e. water). With passion they started to tell me how important water was to the people of Ughelli in the olden times. Specifically, the oldest man (above 80 years) amongst the people I interviewed during my fieldwork in Ughelli who lives very close to Otor-Ihwreko River.

The day I visited him, I went with my mother to his house unannounced because my mother told me that he has much knowledge and experience about the history of Ughelli and how things in the town have transformed. When we arrived at his house he was sleeping in his sofa and we greeted him. Then I told him the reason why we are there. He immediately started telling me the meanings and values of water to the Ughelli people in the olden times⁵⁸.

According to Mary Douglas “our idea of dirt is compounded of two things, care for hygiene and respect for conventions. The rules of hygiene change, of course, with the state of knowledge” (1966: 7). In this sense, for elderly persons in Ughelli, they have different understanding of dirt in regards of the present state of water sources and the ways the people in contemporary time now use it. For them in the olden days they had several meanings and values they attributed to the use of water.

As I already mentioned above (in 4) water played a significant role in the lives of the people of Ughelli, because it was their main source of livelihood. Therefore, based on the importance of water to the forefathers of Ughelli, they decided to settle in the region where Ughelli is located today.

Generally, the Urhobo people were always living close to water because of its importance in their daily life. It was obvious that they had respect for water because of the way they gave values and meanings to water. Unlike today where water sources such as streams, creeks and rivers are used as waste dumps for industrial and factories waste as well as domestic waste. Furthermore, another practice related to that is in practice today. According to an elderly man who I spoke with, people now

⁵⁸ Individual interview no 14.

make use of a chemical liquid called gamelan (a highly toxic chemical) to catch fish and by so doing killing all the fish in the rivers.

In other words, in the olden times, the people of Ughelli had some values for water such that the throwing of any form of waste or chemical into water sources were seen as violation of the law. If a person was caught throwing dirt into the rivers or streams, that person had to pay a fine⁵⁹.

The people of Ughelli in the olden times also had values kept by men and women in the ways they used water culturally such as hygiene. An example was the use of *Ugogono* (i.e. bucket) for washing clothes or bathing. The *Ugogono* that was used for washing clothes or bathing was not used for fetching water for cooking or kept in the kitchen. They were not also washing clothes closed to water well because well-water was also fetched for drinking. Therefore, whenever they needed to use water for washing or bathing, they had to go there to fetch water in the *Ugogono* and take it home for use⁶⁰.

According to elderly persons, the modern generation does not have any values or respect for water sources as they were used to in the olden days.

My understanding of the meanings and values the people gave to water in the olden days is based on the fact that it played a significant role in their daily lives and they depended completely on water. While today according to my observation the majority of the people do not care of where they throw their dirt to. During my ethnographic fieldwork I saw people several times in the markets, along the roads and in the streets throwing away dirt on the ground or rivers without caring about it (especially empty sachet water). This can also be understood according to Douglas when she says the rules of hygiene changes, the reason is because today there are no longer rules or laws of violation when someone throws dirt in the rivers, unlike in the olden times, so the people do whatever they like.

⁵⁹ Individual interview no 14.

⁶⁰ Individual interview no 16.

Religious Context with Water in the Past and Present

Another important activity that took place in those days on the Otor-Ihwreko River was the *Iyeri* festival particularly celebrated by the people of Otor-Ihwreko community. The *Iyere* festival is an annual festival celebrated in the month of September for nine days, and is the most important festival in Ughelli where people come from far and near to witness the ceremony⁶¹.

During this festival the use of a particular stream of water is required for sanctifying and washing of ancestral relics. In the ninth day which is the last day of the festival that is called *Omanuku*, the people will paddle canoes on the Otor-Ihwreko River in Ughelli with happily dressed celebrants. This celebration is the form of a ritual to worship the river goddess called *edjorame*.

In the olden times, the people living closed to the Otor-Ihwreko River have testified that they have encountered the *edjorame* river goddess many times. According to one of the elderly man I interviewed, who told me that his house was located much closer to the Otor-Ihwreko river bank then. He said on a particular day (either in the year of 1954 or 1955 he can no longer remember) he and his cousin went to the river to have their bath. His cousin had an encounter with the *edjorame*. Immediately his cousin saw the *edjorame* coming towards him he ran away in fear. Furthermore, he also stated that because his parents are Christians he never took part in the celebration of the *Iyere* festival in Ughelli⁶².

In regard of the use of water in traditional religious festival in Ughelli, all the people I interviewed referred to the *Iyeri* festival as the festival of the Ihwreko community people who are the ones who are worshipping those gods. Additionally, they also referred to such religious practices as things of the past, that people are gaining more awareness and they are no longer interested to worship those gods as well they are no longer interested to make all those necessary sacrifices. Thus, they are enlightened and people now embrace Christianity as a religion⁶³.

⁶¹ URL 8: Iyeri Festival of The Ughelli People

⁶² Individual interview no 11.

⁶³ Individual Interviews (08.2014).

Though, this festival is still celebrated until today but only by a small group of people in Otor-Ihwreko. There are two reasons why the Iyeri festival is no longer like before. These includes:

1. The majority of the people of Ughelli are now Christians and
2. The Otor-Ihwreko River is no longer as deep as before because the river is now used by market sellers and buyers as waste dumps and the water channels have been blocked by building of houses and roads on top of these channels.

In the next chapter I will focus on the impact of government on water supply in Ughelli. I describe how the UNUWBD was functioning before now and the reason why it is not supplying water anymore. I also make reference to the National Agency for Food and Drug Administration Control (NAFDAC) which is not doing their work as proper as it should be. I also give a short explanation on the perceptions of the people about the health workers and environmental workers in carrying out their duties.

9. Impact of the Municipal Government on Water Issues in Ughelli

9.1. The Ughelli North Urban Water Board Division

When I was still a child in the late 1980s, I went with my elder siblings to a street that was near the place we were living to fetch drinking water from a private tap. The tap belongs to the family of a secondary school principal and it was situated in the front of their compound. Water from this tap was supplied by the Ughelli North Urban Water Division (UNUWBD). During this time, I went to fetch water with a small jerry can and my elder siblings were carrying bigger jerry cans. Then, the people especially children came from within the neighbourhood and from far away to fetch drinking water from this tap. We usually placed our jerry cans in a line according to who came first and during this period of waiting, all the children would play together before it gets to their turn to fetch water.

Also, during this time, the people of Ughelli have not started installing borehole water in their compounds and the population of the town was not as big as it is today. Hence, all the water taps in Ughelli town during this time were only supplied by the (UNUWBD) to private persons who were able to afford to pay the connection fees made by the urban water board. However, since more than two decades now the UNUWBD is no longer supplying water in Ughelli town due to lack equipment maintenance.

As one of the focal point of my thesis is to inquire knowledge on the role played by the government concerning the provision of water to the general public, especially in present times where all the sources of drinking water in Ughelli in the olden times are now polluted either from oil exploration or factory waste and domestic waste.

I decided to visit the UNUWBD to observe and inquire for new knowledge about the role of the Nigerian federal government, Delta State government and municipal government of Ughelli on the provision of water to the general public in this town.

The UNUWBD is located at the west of Ughelli town. Inside the compound of the UNUWBD is a high water tower where the water is stored and below in front of the tower is a treatment plant for purifying the water. My first understanding when I got into the ministry was the lack of maintenance of the equipment used for water supply. The most noticeable equipment that shows lack maintenance was the treatment plant

which was looking old and rusty. One can easily tell that the treatment plant cannot be functioning. Aside other things, in ministry there were only three workers. When I asked for the rest of the workers I was told, that there are other workers at the moment because they are not supplying water now. Furthermore, there are private workers carrying out installations of new water pipes. Thus, there will more workers after the installations are completed. My intention was to conduct interviews with more than one employee of the UNUWBD. However, when I got there, I met a woman and a man who were sitting in front of the generator`s house. Therefore, after I told them my intention to inquire knowledge for my thesis on how the UNUWBD is working, I was directed by them into the office. Inside the office there was only one worker, thus, I asked him if I could interview him which he agreed to do.

When I asked him to tell me about the function of the UNUWBD, he told me that the UNUWBD was built in the year 1965 with a borehole drilled to a depth of 300 feet⁶⁴. Thus, the borehole of the UNUWBD is much deeper in comparison with all the private borehole water systems found in Ughelli today which have a depth from 60 feet to 80 feet, or the private water companies which have a depth of 200 feet.



Fig.21: The Ughelli North Urban Water Board Division tower

⁶⁴ Expert interview no 3.



Fig.22: Ughelli North Urban Water Board Division treatment plant.



Fig.23: The Ughelli North Urban Water Board Division tower



Fig.24: The equipment house in the compound of Ughelli North Urban Water Board Division.

As I was told by the employee I interviewed, he explained to me that then, when the UNUWBD was still functioning and effective individual persons who wanted to have water from the UNUWBD in their compound first of all they had to pay the government services fees for the water pipeline connection. When the water pipeline has been connected the individual person had to go to the office of UNUWBD to register with them. Thus, a token amount of money was paid to the government every month by the individual person.

There was a commercial department where a monthly fee was paid of about 300 naira per month to the government. After each payment a receipt was also issued to the person. At the same time, private companies like banks and filling stations were also connecting water from UNUWBD. For these companies, there was an edit for actual payment depending the agreement between the municipal government and person who was responsible for the water connection of the company. Thus, unlike individual persons, companies had to pay on yearly basis. As the employee of the UNUWBD stated, the Delta Glass (now Beta Glass) was paying for the water supply at this time on yearly basis. Furthermore, according to him some water companies were also connecting water from UNUWBD too and they paid on yearly basis⁶⁵.

⁶⁵ Expert interview no 3.

Presently, as I already mentioned above, the UNUWBD has not been supplying water for more than two decades, because there was no maintenance the way as required for the functioning of the equipment. For example, like the water pipes that are connected around the town of Ughelli are presently faulty because they are asbestos pipes. Thus, because of old age and no maintenance all of them are broken. Due to the faulty pipes, whenever water was pumped for supplying the people, because the water pipes are leaking and broken, this makes the pumped water to mix with surface water, which will eventually contaminate the water. Thus, instead of them to provide contaminated water to the people they stopped completely⁶⁶.

Another reason why the UNUWBD is not functioning for supplying the people with potable water is because it is privatized from time to time from new government to private companies. Thus, for many years now, as I was told, whenever there was a change of government, ongoing projects in the UNUWBD from the previous government were abandoned. At the same time, UNUWBD for some years has been also privatized to private companies to take charge of repairs and project⁶⁷.

However, such companies are not supervised by the government, which is a result why the problems still remain the same. For example, as I visited the UNUWBD there were only about 4 workers on duty, thus, I asked for the remaining workers, and I was told that before now, when they needed someone to make some repairs like for treating the water. They have to inform the Delta State headquarters in Asaba to send a chemist to Ughelli to do the repairs.

In this regard, there are many biochemistry graduates in Ughelli who do not have jobs, and they would be able to do such repairs and maintenance of equipment, but, rather people come from far to manage such problems. At the same time, I was told that new PVC pipes are now been replaced by the old ones. But is hard to know how long it will take them to complete the project.

In this view, an elderly man I interviewed, about the solution to the problem of potable drinking water supply in Ughelli stated that the urban water board in Nigeria were implemented by the colonials of the country. Especially because at the time these urban water boards were implemented the country was in the beginning of oil

⁶⁶ Expert interview no 3.

⁶⁷ Expert interview no 3.

exploration. That, the colonials were aware of the fact that oil exploration has a great effect on water sources and this was the reason for the urban water, so that nobody should be cheated in this aspects. Furthermore, for him, as it is now not only in Ughelli, but the whole of Nigeria, all the sources of water that one can get whether it is branded water or borehole water they always have one lack or the other⁶⁸.

Though the UNUWBD is not supplying water for more than two decades now, because of lack of equipment managements. From time on, the UNUWBD were not supplying water to the general public. Out of 100 percent of the population of Ughelli town when they were still supplying water only about 5 percent of individual persons had the money to connect water from the UNUWBD.

Generally, according to the people's perceptions about water supply in Ughelli, the municipal government is supposed to be the one responsible for the provision of potable drinking water. However, they are not doing so, first because right from time, the municipal government never allowed the people to participant in water supply issues. Nigeria is an oil rich country that could easily provide free potable water and medical care to the whole population of the country.

As an elderly man I interviewed phrased it when I asked him about the solution to the problem of water provision, "the government has not allowed participation of individuals in the area of water. Thus, water has been monopolized as a business by the government. That the government is supposed to know water is an area where the majority of the people are suffering⁶⁹".

According to my understanding there are two reasons why the UNUWBD is not functioning and these are as follows:

1. Privatisation of the UNUWBD to incompetent companies to care for the infrastructure and water supply and
2. No participation, in other words there is a gap between the people and the municipal government in how the UNUWBD is managed.

As I mentioned above (see. 2.1.4.), recently applied anthropological studies see water insecurity in developing countries as a political dilemma. In this regard, the inability of the municipal government for providing inadequate water for the people of Ughelli can

⁶⁸ Individual interview no 13

⁶⁹ Individual interview no 13.

be seen as a dilemma. Furthermore, the case of Ughelli of not having adequate potable water is a critical means for understanding political environmental issues. For example, as I have also mentioned above (2.1.4) there are wide ranges of new laws and policy frameworks as well as many other monitoring agencies in Nigeria, however all these are not used accordingly, based on my observation in the field. As I also mentioned above (2.1.4.) Nigeria is among those countries that adopted the MDGs, in which the access to drinking water and sanitation are among the goals to be achieved this year (2015). However, because of the continuous and poor state of the environmental sanitation as well as high rates of water pollution in Nigeria, this pose serious doubts on the ability to provide the quality and quantity of requirements to meet MDGs (Adediji and Ako 2009: 643). At the same time, agencies that are supposed to control safe drinking water and environmental sanitation are also failing to do their work.

In the remaining sections of this thesis I will give a short description of the major agencies responsible for water issues in Nigeria, according to the perception of the people and my personal observation during my ethnographic fieldwork. This means for anthropology in contemporary times to look at the role of the government on environmental degradation issues relating to water pollution on the one hand and the term environmental justice on the other. This is because most of the people effected are those who cannot afford to provide themselves and their family with potable water, thus this opens the risks of environmental degradation and health challenges.

9.2. The National Agency for Food and Drug Administration and Control

In Nigeria, the only agency that is in control of packaged water is the National Agency for Food and Drug Administration and Control (NAFDAC). The NAFDAC is an agency that is under the Federal Ministry of Health (FMH). The responsibility of NAFDAC is to regulate and control the manufacturing of imported, exported sale and use of food, drugs, medical devices, chemicals and branded water, advertisement and distribution (National Bureau of Statistics 2015).

In terms of branded water in Ughelli, according to the general perception of the people, NAFDAC are not doing their work properly. The reason why is because not all branded water sold in Ughelli is safe for human consumption. For them, if the branded water companies especially the sachet water are well monitored, there will be no unsafe

branded water. In this aspect, several studies have showed that the majority of branded water sold in Nigeria are unsafe for drinking.

An example is from Oluwatoyin A. Igbeneghu and Adebayo Lamikanra (2014) who are from the Department of Pharmaceutics, Obafemi Awolowo University in Ile-Ife, Nigeria. The findings from their studies indicated that the water produced by the 10 institutional, medium and small scale producers in Nigeria ought not to be in the market for public consumption. That these producers of branded water underscore the relevance of regulatory agencies.

In this aspect an elderly man whom I also interviewed, said that the government and Nigeria should try to set up agencies who would be doing their jobs in order to see that there are no longer such unlicensed water companies in Ughelli as well as the whole of the country⁷⁰.

9.3. Health and environmental Workers about Water Issues in Ughelli

When I interviewed the people about a solution to the problem of water pollution in Ughelli people stated that the problem also comes from the side of health workers. There are health workers whose duty is to control those dangerous waste in the town where people are residing. Thus, according to the people perceptions health workers should be controlled whether they are carrying out their duties as they are supposed to.

At the same time, people also stated that the environmental workers like the health workers are not doing their duty properly as mentioned above because their main duty should be to remove dirt from the market place and the environment in general. As they are paid for doing this work, there should be an extensive control concerning the work that should be done⁷¹.

⁷⁰ Individual interview no13.

⁷¹ Individual interview of elderly persons and youths (08.2014).

Conclusion

This master's thesis deals with environmental degradation's effects on water sources in contemporary times in urban Ughelli and two of Ughelli's peri-urban communities. Thus, it deals with the question, how water pollution changes the public health as well as cultural and economic life of Ughelli people in Nigeria: How does the use of the river as well as the water provision from different sources in Ughelli change because of water pollution? What are the perceptions of different groups of people in Ughelli on water pollution? How do the perceptions regarding water pollution differ according to age and profession, and how are the people adapting to the changes that accompany water pollution?

Before I went to the field, I read studies that had already investigated the problem of environmental degradation in the Niger Delta. For example, I read about the problems and management of waste disposal in Ughelli (Efe 2013), water quality issues in the Niger Delta of Nigeria, in respect to heavy metal levels in surface water (Nduka and Orisakwe 2011), and the effects of gas flaring on the surface and ground waters in Delta State, Nigeria (Nwankwo and Ogagarue 2011). These studies were carried out with surveys to analyse the quality of water in the Niger Delta. However, I went to the field as an anthropologist to carry out my research without doing water analysis concerning the quality of the water, but just to acquire knowledge from the people and observing what is going on with the environment, the health problems, and adaptation strategies in urban Ughelli and two of Ughelli's peri-urban communities.

Having such thoughts in mind, displayed in my prepared semi-structured interview guide, I began to find information on the subject matter. I approached the field with a background in environmental anthropology and an understanding of environmental urgencies of this century, such as population growth and increased levels of toxins impact on the environment (e.g. Crumley 2001; Leatherman and Thomas 2001; Kopnina and Shoreman-Ouimet 2011; Kopnina and Shoreman-Ouimet 2013), water sustainability (Orlove and Calton 2010), and environmental discourses (e.g. Milton 1996). From the very first day I arrived in the field and without waiting, I carried out three interviews with my friends who came to welcome me, as a trial run to confirm whether or not I could achieve the general goal of my thesis. Thus, from the three interviews I conducted I had the feeling that I would be able to acquire information on the changes of water pollution in Ughelli. With the interviews and observations that I

undertook in the field, I was able to reach my objective and answer the research questions for this thesis.

As anthropologists Leatherman and Thomas point out, environmental problems in this century accompanied by population growth might impact degradation of environmental resources and biodiversity (Leatherman and Thomas 2001: 118). According to Wilk “rapidly increasing levels of consumption of materials, energy, and services are seen as one of the fundamental drivers of global and local environmental change” (Wilk 2002: 5). The empirical data collected for this thesis describes the various causes of environmental degradation that affect water sources in contemporary urban Ughelli and two of Ughelli’s peri-urban communities. These include oil companies and factories’ toxic waste, and domestic waste as well as other factors such as the blocking of water channels with houses and roads from the government and individuals. The increase of domestic waste as I have described in this thesis is a result of rapid population growth and lack of waste management in urban Ughelli. The blocking of water channels in urban Ughelli, as I have also explained in this thesis, is on one the hand a result of the rapid population growth which leads to the lack of plots of land, leaving the people with the only option to build houses on top of water channels, and on the other hand, urbanization. Therefore, these reasons have not only polluted the underground water for farm lands, but also polluted rivers, streams, ponds, which were once used by the people of Ughelli as sources of drinking water, and for wild fishing (see. Watts 2011; Adeh 2011; Ukaga 2012; Nduka 2011; Efe 2013). Thus, this thesis contributes to a better understanding of environmental anthropology in relation to chemical waste, the impact of the population’s growth on the degradation of water sources in contemporary times, and to general global and local environmental change in contemporary times.

New and re-emerging infectious diseases such as waterborne diseases in contemporary times are seen as a result of water depletion (see. Newson 1998; Sattenspiel 2000). Due to water pollution in urban Ughelli, this also brings new and re-emerging infectious diseases like waterborne diseases. As I have explained above in my personal interest, waterborne diseases are one of the main reasons why I took this subject matter for my master’s thesis. Thus, I have also described in this thesis new and re-emerging infectious diseases like typhoid, cholera, diarrhoea, cancer as well as other unknown health issues to be a result of environmental degradation effects of water sources in contemporary Ughelli. For instance, in 1831 over 50, 000 people died

of typhoid in the UK, which was a result of water pollution from humans and industrial waste in the UK (Strang 2004: 30). This was also the same in Munich, Germany: as industrialization in the century grew, cholera caused thousands of deaths, which also caused the death of the king's mother (Weiz 2012: 191).

I have elaborated on health problems based on what I was told by a doctor in the Ughelli General Hospital who I interviewed. According to the doctor, there is a statistic that shows that one person in each of two families in Ughelli is sick from waterborne diseases every two weeks. I also gave examples of the ways both elderly persons, youth, and children explained their experiences to me about waterborne diseases. As I also show in my thesis, the degradation of water sources has not only affected the people, but it has also affected the aquatic life. Waterborne diseases in Ughelli, as I described in this thesis, contribute to the understanding of anthropological approaches on environmental justice that focus on toxins that affect both humans and aquatic life in urban environments. It also contributes to the understanding of anthropological framing of new and re-emerging infectious diseases, which are a result of rapid population growth that leads to the increase of waste production, therefore resulting in sanitation problems in this century.

This thesis also describes the different sources of drinking water and complex ways in which water was used in the olden times in urban Ughelli, according to the answers given by the elderly persons who participated in the interviews. In other words, the water consumed by the people in the olden times came from rivers, streams, and ponds that were close to their farm lands or where they carried out their fishing. This is because the people of Ughelli in the olden times were not disposing waste on their water sources, thus, there was no pollution in these water sources. At home in the olden times, the drinking and cooking water used by the people came from locally dig-out wells. As I have explained, the people did not drink the water directly from the well, however, they have a traditional way of treating the water before drinking it. This can be understood for example, to historical Celts' low-key use of water sources, which involved simple technology, such as "a few stones placed to improve access to spring waters", and "the planting of sacred trees around holy wells" (Strang 2004: 21). Although, the people of Ughelli in the olden times were not placing stones to improve access to rivers, ponds, and streams water, or planting trees close to wells, they respected their environments nonetheless, especially water, because it was their only source of livelihood.

As Orlove and Caton suggest "anthropological analysis of a waterworld ought to be concerned with five principal themes: value, equity, governance, politics, and knowledge" (Orlove and Caton 2010: 404). Leatherman and Thomas state that "as people find their own efforts insufficient to make ends meet, and even to preserve their own health and that of their children, they will search for ways to circumvent or change the social systems that constrains them" (Leatherman and Thomas 2001: 119). In accordance with these views, I also describe in this thesis the different sources of drinking water in contemporary Ughelli. This is because in contemporary Ughelli all the sources of water consumed by the people in the olden times are no longer fit for human consumption today, which is as a result of environmental degradation effects of water sources. Thus, in order to circumvent rivers, ponds and streams or well water because of health challenges, they now have new ways to provide themselves and families with potable drinking water. I explained this according to the different income status of the people of Ughelli. These include;

1. Branded water, which is sachet and bottled water, and is the source of drinking water for the majority of the people who are of average class, although not all branded water in Ughelli or the whole Nigeria is potable drinking water (see. Igbeneghu and Lamikanra 2014).
2. Borehole water system: Today in urban Ughelli, almost all the houses both new and old have a borehole water system that supplies the people with water, however, the majority of the people do not drink this water, they only use it for cooking, and washing of clothes and dishes. As Sattenspiel points out, because of the population density in Africa, the plots may be so small that placing a well or water system that is recommended to be 30m distance from cesspits may be very close to a neighbour's well or water system (Sattenspiel 2000: 11). Thus, based on this, only high-income class inhabitants are able to provide themselves and their families with a drinkable borehole water system.
3. Water from either Shell public or Private manual taps is consumed by low income class, high income class, and averages persons in urban Ughelli. As I explained based on the perspectives of the people, Shell public taps are regarded as the best drinkable water in Ughelli, thus, those living nearby and far go there to fetch drinking water for their families. Private water taps, meanwhile, are provided by individual persons in urban regions to supply the lower income class.

The analysis of different sources of drinking water in contemporary Ughelli, contribute to an anthropological framing of how people preserve their own health and that of their children, in search for new ways to circumvent or change the social system that constrains them.

As Winthrop postulated “understanding environmental change over time is essential to assessing the current condition of the landscape and to understanding how and why healthy or damaged ecosystems have evolved to their current states” (Winthrop 2001: 206). This is also true in understanding environmental changes in the case of Ughelli people, for example, in the olden days the Otor-Ihwreko river banks played a significant role in the economic activities of the people of Ughelli living in both rural and urban communities. Thus, my empirical data also shows that urbanization and environmental degradation have changed the state of water sources over time.

In other words, the different economic activities carried out on the Otor-Ihwreko River banks through the river in the olden days are no longer possible because of urbanisation in recent times. Hence, road transportation and market stalls are now built. Furthermore, the people now use the Otor-Ihwreko River in urban Ughelli as a waste disposal site.

The ethnographic findings for this thesis also show the different sources of fish sold or exchanged in Otor-Ihwreko market both in the olden times and in contemporary times. As I have explained, the people in the olden times only ate wild fish, which they either fished themselves or they exchanged with agricultural products with neighbouring ethnic groups who came to the Otor-Ihwreko River banks to trade their goods by barter. My findings also show how the people in the olden times dedicated two days of the week to go to the market to exchange their goods to trade by barter. However, today, the market is open every day and people come from far and near either to sell their goods or to buy whatever they need for their day-to-day lives.

Furthermore, today because of environmental degradation effects of water sources, it has become very difficult to find wild fish in Ughelli rivers, which has affected the price of fish in the markets. So this thesis also explains the different fish sold in Otor-Ihwreko Market and Warri Effuru Market.

In order for me to observe the new technologies that are now used to keep farmed fish, I visited a fish farm in one of Ughelli's peri-urban communities. My ethnographic results also revealed that the necessary requirements for a fish farmer have to be (1) a marine education for himself or for his employees, (2) the water used for nurturing the fish

must be taken to the laboratory first and (3) the fish farm must be far away from where human beings are living.

My findings reveal that the Urhobo people were in general always living close to water (rivers, ponds, and streams) because of its importance in their daily life. It was obvious that they had respect for water because of the way they gave values and meanings to it. The people of Ughelli had some values for water, for example, in the olden times, the disposal of any form of waste or chemical into a water source was seen as violation of the law. The people of Ughelli in the olden times also had values kept by men and women in the ways they used water culturally, for example, for hygienic purposes. Rules of hygiene have changed, the reason is because today there are no longer rules or laws of violation when someone throws dirt into the rivers, unlike in the olden times, so the people in contemporary times do whatever they like.

An important activity that took place in the olden days on the Otor-Ihwreko River was the *Iyeri* annual festival particularly celebrated by the people of Otor-Ihwreko community. Although this festival is still celebrated today, it is only put on by a small group of people in Otor-Ihwreko. There are two reasons why the *Iyeri* festival is not the way it was before. First, most of the population has converted to Christianity and second, the river is mostly used as waste dump.

Just like water management has changed in Munich, Germany (see. Weiz 2012), in Dorset in the UK (Strang 2004), in the Okanagan Valley of British Columbia (see. Wagner 2012) or in Africa e.g. in Kenyan urban water supply (see. Nilsson 2008) and all over the world, this is also the case in urban Ughelli. As I cited Strang above “water is always a metaphor of social, economic and political relationships – a parameter of the extent to which identity, power and resources are shared” (Strang 2004: 21). As my research data has also revealed, water supply from the municipal government has always been involved with economic interest, and presently, the UNUWBD, which has always provided potable water in urban Ughelli, has not been supplying water for more than two decades. The reason for this was the lack of proper equipment and maintenance. As my research reveals, the underground water pipes that are connected around the town of Ughelli, are presently faulty because they are asbestos pipes. Another cause for the problem is that the UNUWBD is not functioning to supply the people with potable water because it is privatized from time to time by the new municipal government to private companies. However, the local government does not supervise such companies, and as a result, the problem still remains the same.

In Nigeria, the only agency that is in control of packaged water is the National Agency for food and drug administration and control (NAFDAC). In terms of branded water in Ughelli, according to the general perception of the people, the agents of NAFDAC are not doing their work properly. In my interviews people stated that the environmental workers, such as the health workers, are not doing their duty properly. These complaints made by the people I interviewed show that it would be easy to reduce several environmental problems if there was a body or agency that would take control and responsibility of these issues described. I agree with Crumley (2001) who pointed out that political ecology offers the clear excitement of policy-oriented politics, radical critique to influence both technical policy and public opinion. Thus, the analysis of the impact of the municipal government on water issues in Ughelli contributes to the understanding of anthropological framing on political ecology.

Finally, I suggest that it is important not only to address the various environmental degradation effects of water sources in contemporary times, but also to address the perception of different groups of people to know the ways the people adapt to water pollution, and the perceptions regarding water pollution according to age and profession.

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Annex

Compilation of Data collected

Individual Interviews

	Date	Sex	Age	Occupation
1	03. 08. 2014	woman	Early 30s	a worker at Altima oil Ltd
2	03.08.2014	woman	Early 30s	a primary school teacher
3	03.08.2014	man	Middle 20s	a youth service corper -Nigeria Youth Service, for newly university graduates
4	03.08.2014	man	Late 30s	a self-employed electrical engineer
5	06.08.2014	Elderly man	66 years	Business man
6	06. 08.2014	Man	Early 30s	an applicant university graduate
7	06.08.2014	woman	Middle 30s	Secondary school teacher
8	07.08.2014	woman	Middle 20s	a biochemist - bachelor final project is on water pollution in Warri and Ughelli
9	08.08.2014	man	Middle 30s	an applicant university graduate
10	12.08.2014	Elderly woman	60 years	ret. teacher
11	12.08.2014	Elderly man	78 years	Professor Emeritus of the University of Ibadan, ret. Provost of St. Andrew`s Cathedral Warri and author of several books
12	13.08.2014	Elderly man	Middle 50s	Ret. a former teacher of physical and health education in “Anglican Girls Grammar Secondary” (AGGS) Ughelli (late May 2015).
13	17.08.204	Elderly man	Early 60s	ret. manager of the First Bank in Ughelli
14	18.08.2014	Elderly man	Middle 80s	ret. employee of Ughelli North Local Government Division
15	20.08.2014	Elderly woman	66 years	ret. employee of Ughelli North Local Government Division
16	23.08.2014	Elderly woman	Early 70s	ret. headmistress of a primary school

17	24.08.2014	Woman	Middle 30s	a self-employed food caterer
18	24.08.2014	Man	Middle 30s	a business man
19	25.08.2014	Woman	Middle 40s	a teacher
20	25.08.2014	woman	Early 30s	A teacher
21	26.08.2014	Elderly man	Middle 50s	business man and ret. Shell oil Company worker

Experts Interviews data

	Date	Sex	age	Occupation
1	09.08.2014	man	Above 40	a manager at <i>Yoma farm and Yoma-Water Company and a fish farmer</i>
2	09.08.2014	man	39 years	the owner of a fish farm
3	12.08.2014	man	Above 50	an employee at the UNUWBD
4	24.08.2014	man	Above 40	a borehole driller
5	24.08.2014	man	38 years	a borehole driller
6	26.08.2014	man	Above 50	a medical doctor at the Ughelli General Hospital

Observation protocol

	Date	
1	05. 08. 2014	Observation of different sources of fish in Warri market.
2	06. 08. 2014	Observation of the position of cesspits and wells of old houses in urban Ughelli.
3	07. 08. 2014	Observation of a private tap
4	07.08.2014	Observation of Shell public tap
5	08. 08. 2014	Observation at the Ughelli North Water Board Division.
6	09. 08. 2014	Observation of Afiersere River.

7	09. 08. 2014	Observation of Yoma-Water-Company in one of Ughell's rural communities
8	09. 08. 2014	Observation of Jonathan Oteri's fish farm in one of Ughelli's rural communities
9	18. 08. 2014	Observation of Otor-Ihwreko River at the Ughelli central market.
10	18. 08. 2014	Observation of the different sources of fish in Ughelli market
11	25. 08. 2014	Observation of the position of cesspits and borehole water systems of newly built houses in urban Ughelli.

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Figure.1: Delta Sate map (accessed 15.05.2015).

Figure2: Photo of villagers weaving a boom to curtail further spread of oil in the Gbogidi River at Otughievwen in Ughelli South LGA contaminated from a ruptured pipeline belonging to the Nigerian Petroleum Development Company (NPDC). (<http://www.informationng.com/2015/01/ruptured-npdc-pipeline-spills-oil-into-river-in-delta.html>). (Accessed 26.04.2015).

Figure.3: Contemporary Ughelli central market Otor-Ihwreko River Bridge, used by both sellers and buyers as waste disposal. (18.08.2014).

Figure.4: Photo of an open space close to the Ughelli North local government area used as waste disposal. (08.08.2014).

Figure.5: Along the road empty bags of pure water in Ughelli. (06.08.2014).

Figure 6: An open modern well in urban Ughelli. (06.08.2014).

Figure.7: Modern well with a covered in urban Ughelli

Figure.8: Branded water sachet water, popularly called by the people pure water and a bottle water the two are from two different companies. (25.08.2014)

Figure. 9: water tanks and purify machines in a water company in one of Ughelli`s peri-urban communities. (09.08.2014).

Figure.10: This is the way a water tank looks like.

Figure.11: This picture shows that the cesspit and the tank are too close (06.08.2014)

Figure. 12: Shell public water tap in Isoko road the middle of Ughelli town. (07.08.2014)

Figure.13: Shell public tap in Isoko road the middle of Ughelli town (07.08.2014).

Figure.14: Shell public tap in Isoko road the middle of Ughelli town (07.08.2014).

Figure.15: Shell public tap in Isoko road the middle of Ughelli town (07.08.2014).

Figure.16: a & b are picture a private manual tap at No. 7 Onovaye Street in Ughelli town with school waiting to fetch drinking water (07.08.2014).

Figure.17: Newly hatched fish in an artificial pond with a pipe flowing from a borehole water system, in the form of a flowing stream (09.08.2014).

Figure. 18: A pond with finger size fish in a fish farm (09.08.2014).

Figure.19: A pond with average size fish in a fish farm (09.08.2014).

Figure.20: Natural pond in a fish farm (09.08.2014).

Figure.21: The Ughelli North Urban Water Board Division tower (09.08.2014)

Figure.22: Ughelli North Urban Water Board Division treatment plant (09.08.2014).

Figure.23: The Ughelli North Urban Water Board Division tower (09.08.2014)

Figure.24: The equipment house in the compound of Ughelli North Urban Water Board Division (09.08.2014).

Abstract

This master's thesis deals with the question, how water pollution changes the public health as well as cultural and economic life of Ughelli people in Nigeria: How does the use of the river as well as the water provision from different sources in Ughelli change because of water pollution? What are the perceptions of different groups of people in Ughelli on water pollution? How do the perceptions regarding water pollution differ according to age and profession, and how are the people adapting to the changes that accompany water pollution? The environmental anthropology theories I use focus on environmental issues in contemporary times. These concern environmental degradation effecting water sources, environmental justice and political ecology.

I have conducted ethnographic research in urban Ughelli and in two of Ughelli's peri-urban communities in August 2014. The qualitative research involved individuals' and experts' interviews, participant observation, and photography. The participants who were interviewed consisted of elderly persons and youths, a doctor, fish farmers, borehole drillers and an employee at the Ughelli North Urban Water Board Division (UNUWBD) as well as children and adults at the Shell public tap and a private manual tap.

The results describe the various environmental degradation effects of water sources, the various health challenges of waterborne diseases, the different sources of drinking water both in the olden times and in contemporary times, changes in economic activities like fishing, the meaning of water in historic times, and the impact of the government on water issues in Ughelli. In my conclusion I suggest that it is important not only to address the various environmental degradation effects of water sources in contemporary times, but also to address the perception of different groups of people to know the ways the people adapt to water pollution, and the perceptions regarding water pollution according to age and profession.

Zusammenfassung

Die Masterarbeit behandelt die Frage, wie sich die Wasserverschmutzung auf die Gesundheit, die Kultur und das wirtschaftliche Leben in Ughelli (Nigeria) auswirkt. Besonderes Interesse gilt der Frage, in welcher Weise die Nutzung des Flusswassers sowie anderer Trinkwasserressourcen Veränderungen unterworfen ist.

Wie wird die Wasserverschmutzung von den verschiedenen Bevölkerungsgruppen wahrgenommen? Welche Sichtweisen ergeben sich aufgrund des Alters oder der

beruflichen Tätigkeit eines Menschen? Wie gehen die StadtbewohnerInnen in Ughelli mit den sich zwangsläufig ergebenden Veränderungen um und wie adaptieren sie ihre Lebensweisen in Hinblick auf kontaminiertes Wasser?

Die Masterarbeit stützt sich auf die Theorien der Ökologischen Anthropologie um zeitgenössische Probleme zu untersuchen. Insbesondere die Auswirkungen von Umweltzerstörung auf Wasserressourcen, die Rechtsprechung in Hinsicht auf ökologische Fragen und die daraus resultierende Umweltpolitik stehen im Fokus der theoretischen Überlegungen.

Die empirische Forschung wurde im August 2014 im Rahmen einer Feldforschung in Ughelli und im peri-urbanen Raum Ughellis durchgeführt. Das Forschungsdesign beinhaltete Interviews mit den BewohnerInnen Ughellis sowie ExpertInneninterviews, Führungen, Beobachtungen und Fotografie. Die InterviewteilnehmerInnen waren u.a. ein Arzt, Fischzüchter, ältere Personen, Jugendliche, Wasserbrunnenbauer sowie ein Beamter der Ughelli North Water Board Division (UNWBD). Ich unterhielt mich mit Kindern und Erwachsenen an einem Shell public tap (einem öffentlich benutzbaren Brunnen des Shell-Konzerns) sowie bei privaten Brunnen.

Die Forschungsergebnisse beschreiben verschiedene Formen der Umweltzerstörung und die dadurch herbeigeführte Wasserkontaminierung und die daraus entstehende Gesundheitsgefährdung. Analysiert werden sowohl historische als auch aktuelle Trinkwasserquellen und die durch kontaminiertes Wasser veränderten wirtschaftlichen Tätigkeiten (Fischfang - Fischzucht). Ich gehe auf die vielschichtige Bedeutung des Wassers in früherer Zeit ein und stelle historische Wertigkeiten von Wasser den Problemlösungskapazitäten der modernen Stadtregierung gegenüber. Aus der Analyse kann die Schlussfolgerung gezogen werden, dass bei Problemlösungen in der gegenwärtigen Zeit die Sorgen und Sichtweisen aller Bevölkerungsgruppen miteinbezogen werden sollten.

Curriculum Vitae

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