Resources Policy 45 (2015) 65–77

Contents lists available at ScienceDirect

Resources Policy

journal homepage: www.elsevier.com/locate/resourpol

Hydrocarbon pollution in the Niger Delta: Geographies of impacts and appraisal of lapses in extant legal framework

Obinna C.D. Anejionu [a,*], Precious-Ann.N. Ahiarammunnah [b], Chinenyendo J. Nri-ezedi [c]

[a] Lancaster Environment Centre, Lancaster University, United Kingdom
[b] Nigerian Law School, Augustine Nnamani Campus, Agbani, Enugu, Nigeria
[c] Nri-Ezedi's Chambers, Onitsha, Anambra State, Nigeria

ARTICLE INFO

Article history:
Received 24 January 2015
Received in revised form
26 March 2015
Accepted 26 March 2015
Available online 17 April 2015

Keywords:
Hydrocarbon pollution
Niger Delta
Oil and gas laws
Environmental pollution

ABSTRACT

The Niger Delta is home to the third largest mangrove forest in the world, endowed with extensive freshwater swamp and tropical rain forests, which are rich in unique biological diversity. However, the region has experienced a wide range of environmental pollution and degradation as a result of decadal extraction of its huge hydrocarbon reserves. Despite the financial benefits accruing from hydrocarbon export, it has raised serious environmental concerns in the region. The pollution has heavily impacted on the ecosystem and health of the inhabitants. Prominent among the hydrocarbon-induced pollution include oil spill, gas flaring, and pipeline explosions. Over 10,000 oil spill and pipeline explosion incidents have been recorded and more than 350 billion cubic metres of gas have been flared in the region in the last 14 years. These have caused huge human and material losses in addition to environmental degradation and poor air quality. The region's ecosystem has therefore been declared one of the most endangered ecosystems in the world. This paper reviewed past and current research on the impact of pollutions from oil and gas exploitation activities, alongside the history of hydrocarbon exploration in the region. It importantly outlined the geographies of the pollution, showing their magnitude and spatial spread to demonstrate how they may have impacted on the wellbeing of the inhabitants of the region. In addition, the paper reviewed lapses in the country's legal framework that has encouraged such practices harmful to the environment. It critically analysed the failure of the relevant legal framework in imposing responsible attitudes and behaviours on the oil and gas companies towards the environment.

Introduction

Nigeria is currently ranked as the largest oil producer in Africa and sixth oil producer in the world (NNPC, 2014; Environmental Rights Action/Friends of the Earth, 2005; Gerner et al., 2004). Proceeds from oil and gas exports contribute immensely to the country's revenue with average daily crude oil production estimated at 2.2 million barrels/day (bpd). The Niger Delta is therefore a key region in Nigeria owing to huge reserves of hydrocarbons and other natural resources it is endowed with. This has turned the region into the economic heartbeat of Nigeria and the centre of oil and gas activities (Niger Delta Awareness, 2007; Zabbey, 2004; Tuttle et al., 1999). The region is densely populated and covers a large expanse of land in the southern part of Nigeria. The Niger Delta as officially defined by the Federal Government of Nigeria encompasses the following states: Abia, Akwa-Ibom, Bayelsa, Delta, Edo, Imo, Ondo and Rivers (Fig. 1). The delta, which is among the world's largest wetlands and the most prominent in Africa, is a vast floodplain built up through centuries of accumulation of silt, washed down the River Niger and River Benue.

The virtually unprotected Niger Delta, which provides the natural habitat for a wide variety of endemic coastal and estuarine fauna and flora, supporting over 60% of the total species in Nigeria (IUCN, 1994; World Bank, 1995) has been greatly impacted by ongoing hydrocarbon exploration and extraction activities, which largely commenced in 1958. As a result, the people and environment of the region have borne the brunt of the activities, and the region has consequently been declared one of the most endangered ecosystems in the world and ranked as a high conservation priority in West Africa (IUCN, 2013, 2009, 1992; Nigerian Conservation Foundation, 2006).

The region has been the focus of increasing research activity in recent years, particularly on the impacts of oil exploitation on the environment (Eregha, and Irugh, 2009; Bayode et al.,

* Corresponding author.
E-mail address: o.d.anejionu@lancaster.ac.uk (O.C.D. Anejionu).

http://dx.doi.org/10.1016/j.resourpol.2015.03.012
0301-4207/

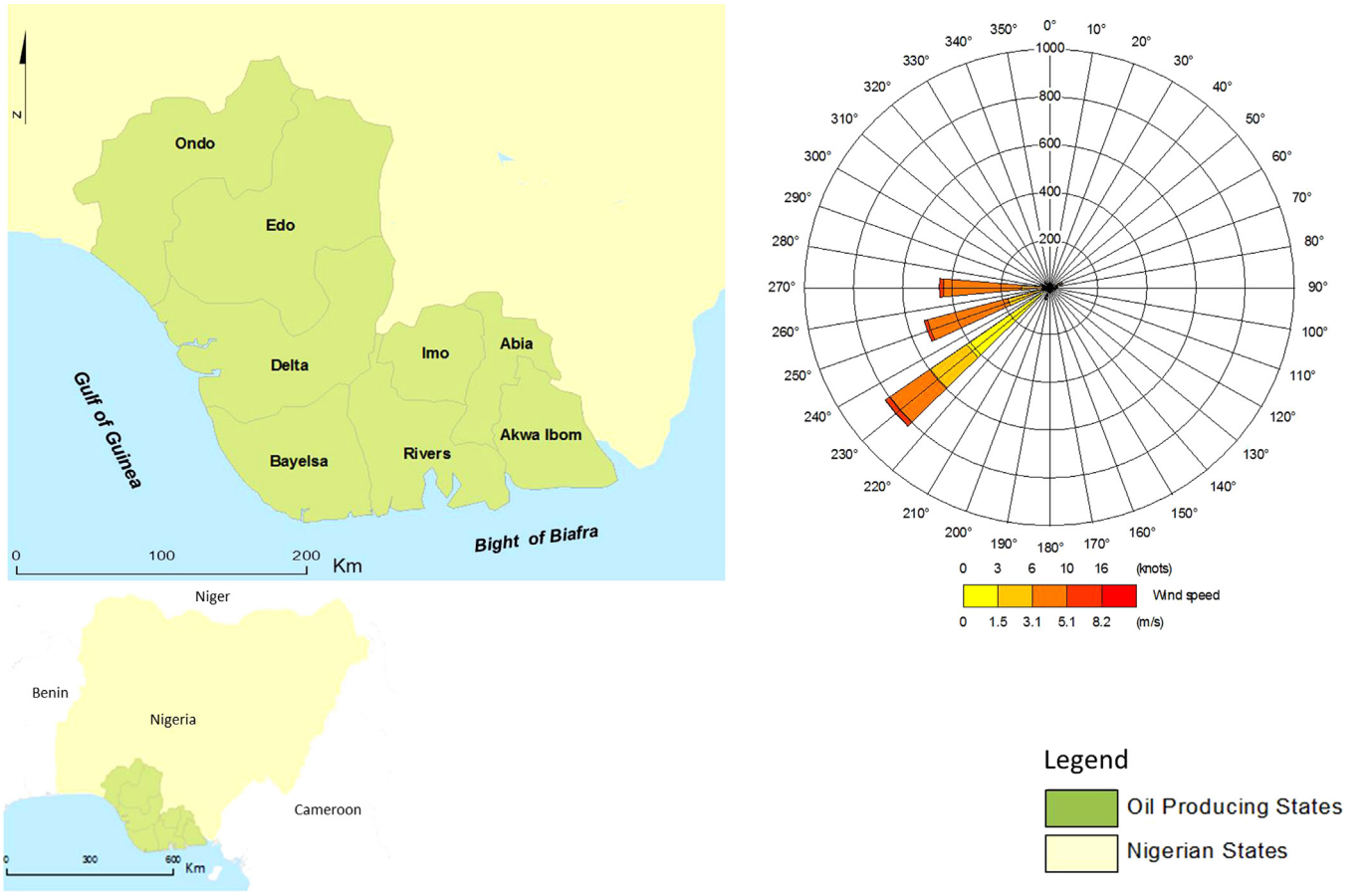

Fig. 1. Map of the Niger Delta region, showing its component oil producing states. The windrose shows typical annual weather profile of the Niger Delta. Bulk of the wind can be seen to be coming from the south-westerly direction (Odu, 1994). Inset shows the Map of Nigeria.

2011; Nwaogu and Onyeze, 2010), socio-cultural and economic characteristics of the region (Aghalino et al., (2010); Ajiboye et al., 2009). This paper reviewed the findings of the various studies that have been carried out on the impact of hydrocarbon-associated pollution in the region. It used geographic tools to outline the distribution of the pollution and associated impacts. It further discussed the failure of the extant laws in controlling the tide of environmental pollution and degradation in the Niger Delta region.

The Niger Delta ecosystem

The Niger Delta ecosystem supports a rich variety of plant (important timber species, edible vegetables, fruits, nuts and seeds, medicinal plants, palm trees, tannins, bamboos and grasses) and animal (monkeys, apes, mongoose, otters, squirrels, Antelopes, elephants; reptiles, 330 different species of birds; insects and invertebrates) species (Kuenzer et al., 2014; UNDP, 2012; Ebeku, 2005; World Bank, 1995; IUCN, 1994). In addition, the water resources in the delta sustain a rich variety of marine life, including shellfish and crustacean (NDES, 1997). From an environmental point of view, the ecosystem is broadly divided into four main zones (with varying boundaries depending on seasonal flooding patterns) namely: mangrove swamps, freshwater swamps, saltwater rainforest, and sandy beach ridges (Nzewunwa 1979; Udo 1978) (Fig. 2). The mangrove forest zone is the most economically rich (huge mineral reserves) of the four zones. The zone is regularly inundated with salt water by rivers and creeks flowing through the forest. The freshwater swamp, located within the flood plains and lying in the hinterlands, away from the mangrove forest, is the most extensive in west and central Africa (Ugochukwu, 2008). The forests are extensive in the central and western part of the delta and relatively thinner in the eastern part due to higher elevations. Seasonal flooding is the dominant ecological influence in the zone, with flood water saturating the soil during the rainy season. The zone is the most heterogeneous among the others in the region, rich with various species of flora and fauna and effectively supports agriculture (World Bank, 1995). The rainforest zone represents the non-riverine (upland areas) of the region, which supports mainly subsistence agriculture. The sandy beach ridges (barrier Island forest), the smallest zone in the delta, lies between the coastal beaches and the mangroves, and is comprised of a band of rainforest species growing on the inland side of the beach ridges and freshwater swamp forests created by the freshwater table (Ugochukwu, 2008).

Brief history of oil and gas exploration in Nigeria

Oil and gas exploration activity in Nigeria can be traced back to 1908, when the Nigerian Bitumen Corporation (a German company) began exploration in the Araromi area of western Nigeria. This initial exploration was however disrupted by the outbreak of the First World War (Ndoms, 2005). Oil exploration activities were reactivated in 1937, when Shell D'Arcy, which was the forerunner of the present day Shell Petroleum Development Company of Nigeria (SPDC) began to prospect for oil (SPDC, 2006). By 1938, Shell D'Arcy was awarded the sole concessionary rights to prospect for oil in the entire country by the British colonial