EXAMPLES OF SUCCESS STORIES IN THE FIGHT AGAINST DIRTY ENERGY AND GOOD PRACTICE IN RENEWABLE ENERGIES

Photo Geopolitis *Impact of an oil spill on a bird*

Photo Dekamile

Women who have benefited from training in solar engineering, working in the training and maintenance centre of the NGO "Dekamile», 2015

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INTRODUCTION

The evolution of human societies is closely linked to the discovery of energy. By getting to control fire, wind and water, to use wood, coal, oil, uranium, etc., people have constantly sought to improve their well-being. In other words, energy is the engine of the world. Energy is essential to meet the daily needs of individuals, industries, transport. If it is mostly invisible, its effects are everywhere. Energy is the very essence of our universe.
Depending on the way energy is produced, distributed or used, it can also be a factor of development or regression. It is therefore legitimate to reflect on: " *Success stories in the fight against dirty energy and good practices in the use of renewable energies* ", it is the purpose of this work.

Today, by evaluating them through the prism of their exhaustible or non-exhaustible nature, their quantity, their formation time, their impact on the environment[1] and mankind, we can distinguish between two major categories of energy: on the one hand, non-renewable energies, and on the other hand, renewable energies.

The category of non-renewable energy is composed, for the most part, of fossil fuels. These are carbon-rich fuels (mainly hydrocarbons, resulting from the methanisation of living beings that have been dead and buried in the ground for several million (or even hundreds of millions) of years. These are oil, coal, peat and natural gas. They are considered as dirty energy by environmentalists.
These energy sources are not renewable because they take a very long time to build up and they are used much faster than the time needed to recreate reserves (their stocks are limited). Although it is not a fossil fuel, nuclear power is considered non-renewable because it is exhaustible and therefore unsustainable.

On the other hand, renewable energies (hereafter referred to as "RE") are energy sources whose natural renewal is fast enough that they can be considered inexhaustible on a human time scale; they are accessible in large quantities. RE is obtained theoretically from unlimited sources or resources, which are available without time limits or can be reconstituted faster than they are consumed. Therefore, there are five main types of renewable energy: solar energy (from the sun), wind energy (from the wind), hydropower (from the force of water), biomass (of plant, animal, bacterial or fungal origin) and geothermal energy (from the earth's heat). They come from cyclical or constant natural phenomena induced by the stars.
The common characteristic of renewable energies is that they produce little or no polluting emissions during the exploitation phase. Thus, they are not likely to aggravate climate change, even if they are likely to lead us towards *a new dependence*: *that of scarce metals*.[2]

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[1] France, SETRA, Ministry of Equipment, Transport and Housing, Lexicon of environmental terms used in road studies, October 1998. Environment refers to the "*set of biotic (living) or abiotic (physico-chemical) factors in the habitat, likely to have direct and indirect effects on living beings, including people. All the natural and artificial elements that surround a human, animal, plant or species*».

[2] Guillaume Pitron, *La guerre des métaux rares : la face cachée de la transition énergétique et numérique*, Les liens qui libèrent, jannuary 2018, 296 pages. In this book, the author points out that graphite, cobalt, indium, platinoids, tungsten and rare earths are resources that have become indispensable to our new ecological (electric cars, wind turbines, solar panels) and digital (they are nesting in our smartphones, computers,

Priorities of the international community in promoting sustainable development[3], in general and the fight against climate change[4], in particular, require that we give time to reflect on the theme of this magazine in order to propose the best options to be adopted by Togo and other countries. To this end, it will therefore be necessary to analyse the advantages and disadvantages associated with one or the other of the two main energy categories.

To do this, our approach will consist of successively addressing success stories in the fight against dirty energy (first part), and good practices in the field of renewable energy (second part).

PART ONE: EXAMPLES OF SUCCESS STORIES IN THE FIGHT AGAINST DIRTY ENERGY

tablets and other connected everyday objects) society. The environmental, economic and geopolitical costs of this dependency could be dramatic.

[3] Togo, Law No. 2008-005 *establishing a framework law on the environment, Article 2, paragraph 17. Sustainable development is: "a mode of development which aims at satisfying the development needs of present generations without compromising the capacities of future generations to satisfy their own needs*".

[4] Article 1 of the United Nations Framework Convention on Climate Change defines climate change as "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*".[4]

In this part, the topic requires us to analyse the impacts of dirty energy use in the world (I), in general, and examples of the impacts of fossil fuels on communities in Africa (II), in particular. Secondly, a clear link must be established between the use of fossil fuels, its effects and climate change (III). Finally, we will try to illustrate some cases of successful struggles against fossil fuels, whether led by civil society organisations, activists, opinion leaders or grassroots communities themselves (VI).

I. IMPACTS OF THE EXPLOITATION OF FOSSIL FUELS IN THE WORLD [5]

The diagnosis of the life cycle of hydrocarbons shows that their exploitation has an effect on the planet: the lithosphere, the hydrosphere and the atmosphere are affected. All stages in the exploitation of hydrocarbons (extraction, transport, refining, use and disposal) are a source of pollution.
The negative consequences of the exploitation of fossil fuels affect the environment, social and economic life at the same time.

A. Impact on the environment

The negative consequences of the exploitation of fossil fuels affect the lithosphere[6] (1), as well as the hydrosphere [7] (2) and the atmosphere [8] (3).

1. Impact on the lithosphere [9]

The consequences correlated with the extraction and exploitation of oil, gas and coal deposits appear as follows:

- Coal mining destroys large parts of the lithosphere by moving and crushing large volumes of rock.;

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[5] https://www.alloprof.qc.ca/fr/eleves/bv/sciences/les-impacts-de-l-exploitation-des-ressources-ener-s1385, consulted on 16 september 2020.

[6] https://www.larousse.fr/dictionnaires/francais/lithosph%C3%A8re/47474, consulted on 30 september 2020. The lithosphere is the outer layer of the earth, 100 to 200 km thick, rigid, consisting of the crust and part of the upper mantle, and limited in depth by the asthenosphere. The lithosphere is fragmented into plates that are mobile relative to each other.].

[7] https://www.linternaute.fr/dictionnaire/fr/definition/hydrosphere/, consulted on 30 september 2020. The hydrosphere represents the surface of the Earth that is covered and occupied by water. The hydrosphere also includes all the waters of the planet, whether in solid, liquid or gaseous form.

[8] Greenfacts : https://www.greenfacts.org/fr/glossaire/abc/atmosphere.htm, consulted on 30 september 2020. According to this site, the atmosphere refers to the "gaseous envelope surrounding the Earth.

The atmosphere is composed of nitrogen (78%), oxygen (21%) and a number of trace gases, including argon, helium, carbon dioxide and ozone. The atmosphere plays an important role in protecting life on Earth, absorbing some of the sun's ultraviolet radiation and reducing temperature variations between day and night.

[9] Allo prof, https://www.alloprof.qc.ca/fr/eleves/bv/sciences/les-impacts-de-l-exploitation-des-ressources-ener-s1385, consulted on 16 september 2020.

- Approximately 2 tonnes of oil sands have to be extracted to produce a barrel of oil;
- The landscape of a region is profoundly altered by the extraction of fossil fuels; Land contaminated by extraction is rendered unusable for agriculture and housing construction. The consequences of the exploitation of natural resources are also felt on the hydrosphere, as we will describe in the next few lines.

2. Impact on the hydrosphere [10]

The after-effects on the hydrosphere caused by dirty energy are no less impressive:

- Large amounts of fresh water are used to wash the facilities, and to push oil and gas to the surface;
- It is estimated that two to five barrels of fresh water are needed to produce a single barrel of oil from the tar sands;
- The transport of oil by tankers (tankers designed for the bulk transport of oil) poses a significant risk to ecosystems in the event of an accident and an oil spill;
- A groundwater body can be contaminated by hydrocarbons.
-

As in the case of the lithosphere and hydrosphere, the impacts of the process of exploiting fossil fuels on the atmosphere are very severe.

3. Impacts on the atmosphere [11]

The atmosphere, too, is being affected by the non-renewable fuel industry. This is because:

- Burning coal and oil affects the health of human populations and the planet's climate balance;
- Many atmospheric pollutants are linked to the use of hydrocarbons: smokes, irritant gases, greenhouse gases, etc. ;
- Polluting clouds travel great distances before falling back to the ground.

It should be noted that the impacts of the exploitation of dirty energy on the environment are many and varied. This form of energy is the cause of pollution, as well as the destruction of flora and fauna.

Oil exploitation has a negative impact on the environment, caused by several phenomena such as oil spills. Two types of pollution are associated with oil:

- It pollutes through exploitation and transport (oil spills, polluting mud and noise pollution);
- It pollutes through its by-products (fuel combustion, which leads to atmospheric pollution, degradation of fauna[12] and flora by plastics).

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[10] Idem

[11] ibidem

[12] Example of major oil spills and their consequences: on 12/12/1999, the Maltese oil tanker Erika was wrecked off the Atlantic coast and was chartered by the company TOTAL. Its 31,000 tonnes of oil discharged off the Loire-Atlantic coast resulted in successive waves of pollution that soiled 400 kilometres of coastline. According to an estimate by the League for the Protection of Birds (LPO), more than 300,000 seabirds hibernating in the Bay of Biscay have died. http://tpehmzpetrole20142015.over-blog.com/2014/12/les-impacts-environnementaux-du-petrole.html#:~:text=Le%2012%20d%C3%A9cembre%201999%20le,souill%C3%A9es%20400%20kilom%C3%A8tres%20de%20c%C3%B4tes.

Moreover, by emitting carbon dioxide (CO2) during their life cycle, fossil fuels contribute to global warming.

Seabird hibernating in the Bay of Biscay, victim of an oil spill Source : Safon-Soyris-Liautaud, 09/12/2014
http://tpehmzpetrole20142015.over-blog.com/2014/12/les-impacts-environnementaux-du-petrole.html

Use of high pressure washing with hot water to clean an oiled shoreline. Prince William Sound Beaches, State of Alaska, USA.
Source :https://commons.wikimedia.org/wiki/File:OilCleanupAfterValdezSpill.jpg

The literature on oil spills at sea is abundant, clearly on the scale of the environmental crimes committed by some multinationals and their accomplices. Two more or less recent cases can be mentioned:

In Mauritius, the bulk carrier [13] MV Wakashio ran aground on 25 July 2020, leaving *huge black slicks in the azure sea moving towards the lagoons, coral reefs and idyllic white sand beaches that have made Mauritius a pearl of green tourism*. The affected ecosystem *includes the most beautiful coral reefs in the world and is a sanctuary for rare and endemic fauna, as well as unique classified wetlands.*[14]

In Brazil, as Yohan Blavignat wrote, oil patties have been observed on more than 130 beaches. According to him, this is a *disaster "of unprecedented proportions*"[15] On the subject, an article published on 29 October 2019 by Le Figaro with AFP, the Brazilian branch of the UN, in a press release, stated that «*The United Nations in Brazil expresses its deep concern about the oil (which has been affecting) the coastline of nine north-eastern states since August, and regrets the incalculable damage to marine and terrestrial ecosystems, as well as to the lives of local populations.*»[16].

While it is obvious that the exploitation of fossil fuels has very negative effects on the environment, the following description will allow us to see whether its effects on socio-economic life are also a matter for concern.

B. Socio-economic impacts

[13] Cargo ship for the transport of solid bulk goods.
[14] https://www.france24.com/fr/20200809-en-images-l-%C3%AEle-maurice-paradis-aux-eaux-cristallines-menac%C3%A9-par-une-mar%C3%A9e-noire
[15] https://www.lefigaro.fr/sciences/bresil-2000-km-de-plages-polluees-par-une-mysterieuse-nappe-de-petrole-20191009
[16] https://www.lefigaro.fr/international/profonde-inquietude-de-l-onu-face-a-la-maree-noire-au-bresil-20191029, accessed 20 August 2020

Today, more than before, it is harder than ever to avoid using fossil fuels. Although it is clear that these forms of energy contribute to global warming, abandoning them will change lifestyles and even development paradigms as they stand today. This explains, in part, the reluctance of some decision-makers to continue to promote these types of energy.
Does this assertion allow us to say that humanity is under the effect of a dependence on these fuels? Jean-Marc Jancovici answers this question by comparing, rightly, this dependence to an addiction[17].

Of these energies, *oil accounted for 34% of global consumption in 2004 (coal 24%, gas 21% and renewables 20%).*[18]

This "precedence" of oil has major social consequences. Indeed, « *Violent riots have been reported in several countries in the North and South following oil price increases. For example, in 2006, French trade unions called for the introduction of a "transport voucher" to help employees who travel a lot to cope with rising fuel prices. »*[19].

While « *in developing countries, soaring oil prices mean less lighting and less hot food (as oil is often the only available source of domestic energy); in industrialised countries, higher oil prices mean more spending on the car»*[20].

In an attempt to explain [21] the way in which the Venezuelan economy collapsed, it is noted that, *Venezuela's horizon darkened when oil started to fall, from 98.98 dollars a barrel in July 2014 to 47.05 at the end of 2014 and 35.16 on average in 2016. The country's revenues have taken a hit, melting from $121 billion to $48 billion between 2014 and 2016. Due to a lack of investment in its infrastructure, PDVSA's production collapsed from 3.2 million daily barrels in 2008 to 1.5 million in March 2018, according to OPEC.*

In other words, how the fact that a country's economy is based on almost a single resource, in this case oil, can seriously worsen the socio-economic situation of the country: it is the Dutch Syndrome[22] which calls for alternative development (it is not appropriate to put all one's eggs in one basket, as the saying goes).

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[17] https://fr.wikipedia.org/wiki/D%C3%A9pendance_au_p%C3%A9trole#cite_note-JancoviciGrandjean200617-2,
Accessed 23 August 2020

[18] https://fr.wikipedia.org/wiki/D%C3%A9pendance_au_p%C3%A9trole#:~:text=Dans%20les%20pays%20d%C3%A9velopp%C3%A9s%2C%20une,source%20d%27%C3%A9nergie%20domestique%20disponible., Dependence on oil, accessed 24 August 2020

[19] idem

[20] ibidem

[21] https://www.capital.fr/economie-politique/quatre-moments-de-la-descente-aux-enfers-de-leconomie-venezuelienne-1287728, How the Venezuelan economy collapsed, online on 14/05/2018, accessed 23 August 2020

[22] The Dutch syndrome, or Groningen Effect, describes the perverse effects of rent-dependency on an economy. The term, first applied in the Netherlands, has been applied to situations as different as those in Venezuela, the French overseas territories and Norway.
The expression comes from the effects of the gas discovery in the North Sea on the Dutch economy. In Groningen, at the beginning of the 1950s, the discovery of the largest natural gas deposit in Western Europe led to a rapid deindustrialisation due to the redistribution of a part of this rent. Indeed, the

The oil and gas countries in Asia, Africa and Latin America are no richer, more democratic or more peaceful than they were before the discovery of oil. Rather, the problems of some countries began at the very beginning of the exploitation of the natural resources in question.

Oil not only causes global warming and economic collapse, it also causes human rights violations including the destruction of the environment (right to a healthy environment) and the loss of human lives. Oil and gas revenues subsidise repressive governments.

Françoise Améyo Délali Kouassi[23] notes « *the existence of a link between environmental protection and the exercise of human rights. In other words, the preservation of the environment is a condition for the realisation of these rights insofar as the exercise of human rights requires a healthy and viable environment. Therefore, environmental degradation undermines the effective enjoyment of human rights.* »

It should be noted that environmental degradation affects people's right to health, especially as their health security systems are linked to the health of the ecosystems around them.

Furthermore, the prior deforestation necessary for oil and gas activities constitutes an infringement of the right of peoples to own and control their lands, territories and resources. Very often people lose access to their lands, territories and resources as a result of dispossession, land grabbing and forced displacement.

For Françoise Améyo Délali Kouassi, « *For most indigenous peoples who depend on the environment for their livelihoods, access to land must be reconciled with the right to adequate food guaranteed by Article 11 of the International Covenant on Economic, Social and Cultural Rights (ICESCR). Consequently, the violation of indigenous peoples' land rights undermines their right to adequate food as it leads to the loss of access to resources essential to their basic needs: water resources, land resources, forests.* »

In fact, is there really anything more humiliating and degrading for a people to be illegally dispossessed of their land? Certainly not! Françoise Améyo Délali Kouassi in the dedication of her publication gives a good reason for this negative answer. This is because: « *the land is the foundation of the indigenous peoples, the seat of our spirituality, the fountain from which our culture and languages spring. The land is the guardian of our history and the flesh of our ancestors. The earth nourishes us, cares for us, shelters us and clothes us. It makes us independent. It is our mother. We do not dominate it and must be in harmony with it* »

After this panoramic view of the after-effects of the fossil fuel exploitation process in the world in general, we will now turn our attention to its consequences in Africa in particular.

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exploitation of the resource and the rent it provides increases the value of the country's currency, its other exports are thus less competitive while imports increase and other productive activities are depreciated, hence deindustrialisation. This phenomenon is amplified in states with serious governance failures.

[23] Françoise Améyo Délali Kouassi, « Activités humaines et catastrophes écologiques : quelle protection pour les droits des peuples autochtones ? », The Human Rights Review [On line], 17 | 2020, put online on 14 January 2020, consulted on 29 August 2020. Link : https://journals.openedition.org/revdh/8067#tocto2n2

II. EXAMPLES OF THE IMPACTS OF FOSSIL FUELS ON COMMUNITIES IN AFRICA

Proven oil reserves[24] have increased by almost 150%, from 53.4 billion barrels since 1980 to 130.3 billion barrels at the end of 2012. The African region is home to five of the world's top 30 oil-producing countries, and nearly $2 trillion of investment is expected by 2036.[25]

While the exploitation of oil, gas and coal in Africa can be assessed in terms of revenues for the state (taxes, in particular), employment and income for professionals upstream and downstream of the sector, overall, the balance is rather negative for communities living near fossil fuel exploration and exploitation sites.
We will also assess the environmental, social and economic aspects. As an indication, we will look at the cases of Ghana, Nigeria and Uganda.

This is because environmental organisations in 4 countries (Ghana, Nigeria, Uganda and Togo) have carried out a study on mapping the operations and impacts of export credit agencies in the energy sector in Africa. As the study is conducted in these countries, there is information to build on to support what we are arguing for in this work. The case of Togo has not been exposed because Togo does not exploit oil, although an exploration carried out by ENI revealed that the country has exploitable reserves.
The situations in Ghana, Nigeria and Uganda will be described consecutively.

A. In Ghana

Ghana started exploiting its first oil and gas fields in December 2010. In a report published by environmental NGOs, entitled: « *Documenting the impacts of export credit agencies in Uganda, Nigeria, Togo and Ghana in the energy sector* [26] », interviews[27] were conducted in the communities bordering the oil and gas field sites.
The impacts of the gas exploration activities of Offshore cape three points (OCTP) on the coastal communities (Shama, Cape Three Points, Abuesi, Aboadze, Sekondi, Takoradi and Busua) of the oil enclave were reported during the testimonies. We will first look at the impacts on the environment.

1. Environmental impacts

Interviewees said that they have observed that the beaches in their communities have become increasingly full of algae due to deep-sea drilling, which has resulted in the introduction of chemicals into the water body. The fishermen specifically explained that deep-sea drilling activities have resulted in the weeding of algae under the sea. As a

[24] https://www.connaissancedesenergies.org/fiche-pedagogique/reserves-de-petrole-dans-le-monde, consulted on 30 September 2020. Oil reserves are defined as the volumes of oil recoverable from exploited deposits. or can be in view of current technical and economic criteria. These reserves may therefore fluctuate, like natural gas reserves, depending on the availability of the technical means to exploit hydrocarbons and on oil prices (with a time lag, as prices determine exploration investments).
[25] https://www.aljazeera.com/indepth/interactive/2016/10/race-oil-gas-africa-161020104953200.html
[26] Study : « *Documenting the impacts of export credit agencies in Uganda, Nigeria, Togo and Ghana in the energy sector* »
[27] The interviews were conducted in the 4 countries concerned by the project in May and June 2020.

result, the algae were found along the beaches. Interviewees mentioned that during the development of the Jubilee oil field, toxic drilling mud was dumped. Six hundred (600) barrels of oil spilled in December 2009, creating pollution of the surrounding ecosystems. Fishermen said that some fish have disappeared and others have moved away or disappeared because of the pollution of the sea.

The survey data in the communities of Kpone and Tema, revealed that the 340 MW gas-fired power plant in Kpone has caused environmental impacts such as: land pollution, ecological deterioration and land use change. In addition to these effects on the environment, there are also social consequences.

2. Social impacts

Interviewees in the communities visited felt that fishermen, women working in fish processing, women and girls, fish consumers and members of host communities suffered most from the social consequences of oil and gas activities.
In Kpone, interviewees reported that their community has experienced an increase in school dropouts, teenage pregnancy, prostitution, and poor reproductive health. However, they could not attribute it to the presence of the 340 MW gas-fired power plant in the community, although some have drawn a parallel. In the communities visited, the interviewees also mentioned the effects of activities related to the exploitation of fossil fuels on their economic activities.

3. Economic impacts

Gas exploration off Cape Three Points has led to increased fishing costs, increased job losses, reduced fish catches and increased income losses.
The interviewees revealed that when fishermen go fishing, they make very small catches of fish and sometimes nothing. It was explained that the lighting system used by oil companies in oil and gas activities attracted fish to the oil and gas fields. In addition, the fishermen expressed their dissatisfaction with a 500-metre no-fishing zone around the OCTP field, as part of their fishing area was located in the "no-fishing zone". Some fishermen's boats and engines were seized by the maritime police when they crossed the no-fishing zone.

Interviewees said that this led to low income levels, job losses and, in most cases, huge debts, as it costs, on average, between $260 and $347 to make a fishing trip. Fishermen sometimes take out loans from banks, micro-finance institutions and sometimes even from friends and family. Most fishermen are in debt and banks no longer lend to fishermen and fishmongers because of their inability to repay the loans. As a result, concerns have been expressed about the impacts of these mining activities on fishing as a source of income and food for many communities.
Fishermen are the main breadwinners at home. Due to the difficulties listed, they are no longer able to supply fish to fishmongers for processing. The cost of fish has also risen because fishermen no longer catch many fish.
In Nigeria, as in Ghana, the perverse effects of the fossil fuel exploitation process are acknowledged.

B. In Nigeria

Within the framework of this work, only the impacts of the *project NLNG Bonny Island Gas Plant* have been considered. This project consists of a series namely: the Core Project (Units 1 & 2), the Expansion Project - Third Unit, the NLNG Plus Project (Units 4 & 5), and Unit 6 and Unit 7. According to the interviewees, the impacts of NLNG could not be differentiated in order to be able to attribute specific impact(s) to specific units. Rather, the impacts are attributed to the NLNG project as a whole.
Bonny Island, where Nigeria's liquefied natural gas (LNG) plant is located, is surrounded by the Atlantic Ocean. It has a population of about 170,000. The island's indigenous population depends on fishing for its survival. They practice small-scale agriculture, mainly growing cassava, yams, coconuts and plantains.
To begin with, we will talk about the environmental consequences of activities related to the fossil fuel process.

1. Environmental impacts

The project has resulted in pollution affecting plants and animals as well as air quality. The project has led to flooding, food insecurity (crop damage), global warming, aesthetic degradation of landscapes, loss of vegetation cover, surface water pollution and groundwater depletion. There is also the loss of agricultural land (for the development of the NLNG plant and its components), and the erosion of biodiversity.

Large-scale gas flaring has implications for environmental quality, climate and community health. Interviewees said that there was no more drinking water in their communities because rivers have been polluted, and gas flares have caused air pollution and acid rain.
The NLNG factories have led to the relocation of indigenous populations and the confiscation of coastal areas, which are particularly well known as breeding grounds for marine species, thus posing a major ecological danger and cultural trauma for humans, as well as the loss of vital habitats that have been used for centuries by animal species.

All these circumstances have contributed to a reduction in life expectancy on the island.

1. Social impacts

Residents of Finima and Bonny Town in interviews said that NLNG officials have not been able to meet their aspirations, leading to demonstrations demanding jobs in the company.
In response, the company ordered the security services to chase away the young protesters without addressing the issue.

Human rights violations resulting from the unusual military presence at the NLNG site regularly result in threats, arrests and detention of juveniles.

When questioned, Finima community youth leader Charles Brown said: " *We have been forced to let the environment degrade as you can see. They said that our people will be employed, but at what cost? When you give a man a dollar today and tomorrow, you take 10 dollars from him; it's not fair. One way or another, we have to find a balance. We need to put things into perspective. We need to sit down with these people and negotiate correctly with them without having weapons pointed at us. The advantages are there, but the inconveniences outweigh the benefits.* "

The interviewees recognise a large influx of non-islanders coming to the island in search of good paying jobs. Foreigners, due to their ethnic and social differences, have profoundly changed the traditional way of life and culture of the inhabitants of Bonny through their ideologies, practices, characters and tendencies. Before the development of prospective oil and gas activities on the island, prostitution was considered taboo, but today it has become commonplace in the community and defies traditional norms.

There are cases of illnesses resulting from environmental pollution. According to the data collected from the population and from sources in local health centres, cancer and respiratory diseases are common. Other common illnesses reportedly suffered by these communities as a result of the company's activities are catarrh and cough, given the proximity of the communities, particularly Finima, to the factory site.

According to the community, these diseases and ailments are the result of many factors, such as gas flaring, air pollution and water pollution.

The interviews show that land degradation and water pollution pose a huge threat to the community's food security, as agriculture and fishing, which are the main occupations or sources of income for the population, have been affected.

One of the social impacts identified is the displacement and relocation of the indigenous populations of the former Finima (who traditionally lived on the waterfront), who initially populated the current NLNG plant site on Bonny Island.
Oil and gas activities are also a source of huge economic problems.

2. Economic impacts

With a view to the creation of the NLNG plant on the site of the old Finima, the federal authorities moved the natives to the new Finima in 1991. This has had an impact on business activities and the capacity of the local community to generate income and improve livelihoods.

At Bonny Island and Finima, the activities of the NLNG plant have resulted in the pollution of the community's rivers and other water bodies, leading to the poisoning of fish and other aquatic life. The pollution has also heavily damaged fishing nets and the inhabitants' equipment. The community's oil and gas activities have had a negative impact on the livelihoods of the inhabitants and have led to increased poverty.

During the survey in May 2020, it was observed that, with the exception of low-level or casual jobs, many of the people working at the NLNG plant and other oil companies in the community are non-indigenous. They come from other parts of Nigeria.

Unlike the agricultural sector, which generates income that is distributed to reach a larger percentage of the population, especially those in rural areas engaged in fishing, agriculture and those involved in the processing and distribution chain of agricultural products, income from the oil and gas sector goes mainly to the government in the form

of royalties or taxes paid by foreign companies involved in oil production or profits from local oil companies.

The populations of Uganda, as well as those of the two other countries mentioned above, continue to suffer the unfortunate consequences of oil exploitation.

C. In Uganda

Uganda started exploiting oil in 2006. While this activity generates revenue for the state, the consequences for communities are very negative, which necessarily compromises the achievement of sustainable development objectives for the country.

First of all, let's look at the effects of oil exploitation on the environment.

1. Environmental Impacts

According to the study, *Documenting the impact of export credit agencies in Uganda, Nigeria, Togo and Ghana in the energy sector*, mentioned above, The "Albertine Graben" is rich in wildlife and natural environment.
The region is home to a large number of mammals, birds and other species, as well as 10 of the country's 22 national parks and hunting reserves. The region also has several archaeological and historical sites that are part of the national heritage. There are Lake Albert, Lake Edward, the Nile, etc.

The displacement of 7,118 people without adequate compensation and the inability to replace their lost land led them to live in protected areas. This leads to a strong degradation of these environments and of the animals (poaching and destruction of the habitat of wild species). The construction of the airport has also generated noise pollution that has affected the behaviour of animals, especially elephants and chimpanzees, thus affecting their breeding and migration corridors.

The study states that according to the Hoima District Environment Officer, "*Affected animals have been confronted with involuntary migration which sometimes end up in people's gardens and houses, causing conflicts between humans and animals and leading to noise pollution.*"

According to the same source, the IUCN Red List Data Document, these animals are classified as endangered. In addition, communities have expressed concern about the uncertainties related to changing weather conditions, prolonged drought and floods that have continued to affect agriculture. With the opening up of the oil industry, there could be a resurgence of these phenomena, which could affect people's livelihoods.

It is appropriate, after noting that oil activities have fundamentally impacted the environment, to question their social impact.

2. Social Impacts

The study "*Documenting the Impact of Export Credit Agencies in Uganda, Nigeria, Togo and Ghana in the Energy Sector*" indicates that without access to land for farming and fishing as their main means of livelihood, some families have found themselves in the city (rural-

urban migration) and find it very difficult to cope with urban life after having lived all their lives as farmers.
This has led to an increase in sexual abuse and sexual offences, which in turn has had an impact on the burden on the health sector.
School children could no longer continue their studies because the only schools in their villages were closed. Of the 7,118 people displaced to prepare for the construction of the project and other infrastructure, 52.8% were school children whose education was disrupted.

The construction of the airport has led to an uncontrolled influx of young people into the neighbouring districts in search of job opportunities, which has already raised fears among the local population about the rise in drug addiction, rape and the sex trade, particularly in the main cities of Hoima, Kikube, Masindi. There are already tensions over potential jobs between local people and immigrants. Older persons complained that they continue to suffer from the impacts despite the commitments made by the government and oil companies to resettle affected communities.

In the Kabaale industrial park, women and the elderly were left out of the resettlement process. The women had no idea how much land their families owned or how much compensation money the family was entitled to. This has led to an increase in domestic conflicts.
Because of the secrecy surrounding the compensation money paid to the families, most of the men used the funds to marry other women, to buy a motorbike. They have made no effort to replace the lost land that women are traditionally forced to use for farming.
When the land was ceded, the communities were given a choice between cash compensation and relocation. Those who opted for cash compensation received some money and left. The departure of their neighbours posed challenges for those who remained, namely: loss of social solidarity, security, access to water and markets. It has also undermined their ability to respond to social causes such as river clean-up, previously managed by the entire community.

It is also useful to see how the Ugandan people have experienced the economic impact of the oil companies' activities.

3. Economic impacts

The study mentioned above revealed that during the interviews, community members expressed their distress at the loss of their main economic activities: agriculture and fishing.
About a third (31%) of the respondents reported that their monthly household income had fallen from 50,000 UGX (US$15) to 100,000 UGX (US$30) to less than 20,000 (US$5.5) because they could no longer engage in a viable economic activity.

The government has prevented affected communities from using their land. It has set a deadline for their resettlement. Once a person's land is assessed, it becomes government property. Communities are no longer allowed to use it for personal interests and no new development would open the right to any form of compensation.

The loss of agricultural land for the project without adequate compensation also meant that affected communities could not replace the lost land, as land prices in neighbouring

villages and districts rose by 40%. This was due to the growing influx of people seeking opportunities in the oil industry and the demand from expatriates.
Land speculation and massive displacement of communities have created inflation that prevents local people from acquiring new land. These challenges therefore led communities to seek alternative solutions in protected areas and forest reserves, as they lacked a guaranteed source of livelihood, decent housing, food and family income.
It should be noted that the expropriation of people's land without adequate compensation has not been carried out without resistance on the part of the victims. This has delayed the relocation.

In recent years, more today than before, the human community has been facing one of its greatest ecological challenges, climate change. What role do fossil fuels play in global warming? This is the question we will try to answer in the next few lines.

III. LINK BETWEEN THE USE OF FOSSIL FUELS, ITS IMPACTS AND CLIMATE CHANGE

Having clarified the concept of "fossil fuels" above, it is also appropriate to clarify the concept of "**climate change**" in order to establish the causal link between the use of fossil fuels and climate change.

As a reminder, climate change is « *changes in climate that are attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that are in addition to natural climate variability observed over comparable time periods* »[28]

The exploitation and use of fossil fuels are in fact anthropogenic activities that modify the chemical composition of the atmosphere and cause the Earth's temperature to be disturbed.

A natural phenomenon, the greenhouse effect has existed *from time immemorial*. *It is the result of the trapping of the sun's rays by the atmosphere. More precisely, some of the sun's rays that reach the ground come to warm the Earth. This emits heat that radiates in the form of infrared rays. Without an atmosphere, almost all of the infrared rays would escape and the heat would be lost. Thanks to certain molecules in the atmosphere (CO2, CH4), a major part of the infrared radiation is captured and then re-radiated towards the earth. It is this mechanism that enables the greenhouse effect.*
It is thanks to the greenhouse effect that the Earth is habitable with an average temperature of +15°C. If the greenhouse effect did not exist, the average temperature on the Earth's surface would be -18°C. In other words, this phenomenon is very useful to us.[29]

In the following lines, we will try to establish the direct contribution of fossil fuels and the increase in the Earth's temperature.

A. The direct role of fossil fuels in increasing the greenhouse effect and thus in global warming

[28] United Nations, United Nations Framework Convention on Climate Change, 1992.
[29] CO2 account, https://www.compteco2.com/article/effet-de-serre-fonctionnement/#:~:text=L'effet%20de%20serre%20est,sol%20viennent%20r%C3%A9chauffer%20la%20Terre. The climate and the greenhouse effect
Accessed on 31 August 2020

Global warming is mainly the result of the forcing of the (natural) greenhouse effect phenomenon. Indeed, human activities involved in the production, distribution and use of fossil fuels have contributed to the emission of a large volume of greenhouse gases, thus increasing their concentration in the atmosphere. As a result, the atmosphere captures more heat, which warms the earth's surface. « *A group of international experts was set up at the end of the 1980s to monitor the evolution of climate change: the IPCC.* [30] *Their work has shown that global temperature has risen by about +1°C since the end of the 19th century and that it is likely to rise by a further +4 to +6°C during the 21st century if nothing is done. However, such a warming would endanger our civilisation and the ecosystems that surround us.*[31]»

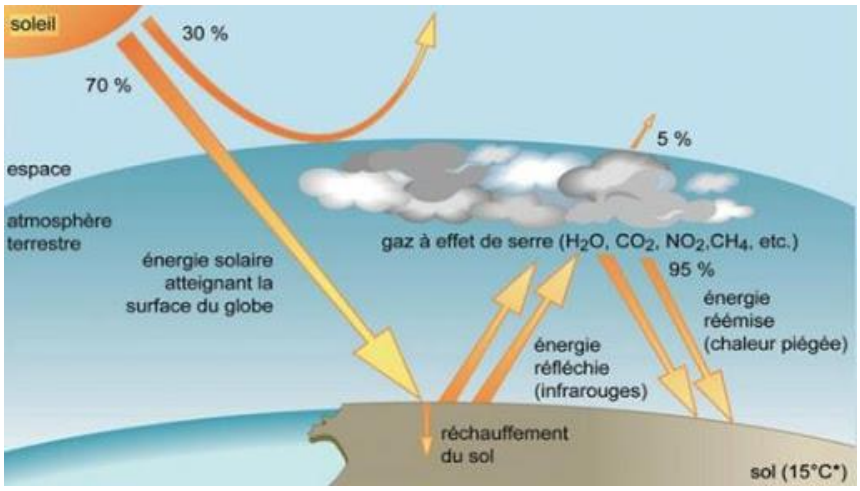

Illustration of the greenhouse effect phenomenon

Depending on the development philosophy chosen by one country or another, and depending on the consideration they give to the international conventions that are supposed to regulate the way the planet is managed, particularly with regard to multilateral environmental agreements [32], some countries stand out (rather negatively) with regard to CO2 emissions from fuel combustion. The table below shows the situation in 1998.

Table 1 : CO2 emissions from fuel combustion, 1998

The largest producers of emissions : Targeted and non-targeted parties in Annex I (Millions of tonnes of CO2)									
	The Big Ten: included and non-included parties in Annex I		**% World**	**The Big Ten: Annex I Parties**		**% Monde**	**Les dix grands : parties non visées à l'annexe I**		**% Monde**
1	USA	5410	24%	USA	5409,75	24%	Chine	2893 , 15	13%
2	China	2893	13%	Russian	1415,78	6%	Inde	908,2	4%

[30] Intergovernmental Panel on Climate Change (IPCC)

[31] CO2 account: *The climate and the greenhouse effect,* https://www.compteco2.com/article/effet-de-serre-fonctionnement/, consulté le 31 août 2020

[32] Multilateral Environmental Agreements (MEAs) are international treaties between several States (more than 2 countries), which aim to protect and restore the global environment and contribute to sustainable development by imposing specific actions on the signatories.

				Federation					
3	Russian Federation	1416	6%	Japan	1128,34	5%	Republique de Corée	370,14	2%
4	Japan	1128	5%	Germany	857,05	4%	Mexique	356,3	2%
5	Germany	857	4%	The UK	549,51	2%	Afrique du sud	353,67	2%
6	India	908	4%	Canada	477,25	2%	Brésil	295,86	1%
7	United Kingdom	550	2%	Italy	425,99	2%	Arabie saoudite	270,73	1%
8	Canada	477	2%	France	375,5	2%	Iran	259,77	1%
9	Italy	426	2%	Ukraine	358,78	2%	Indonésie	208,47	1%
10	France	376	2%	Poand	320,16	1%	Rép. Pop.Dém.de Corée	199,66	1%
	Total	14441		Total	11318,11		Total	6115,95	
	% of world total	64%		% of world total	50%		% du total mondial	27%	
				% of total annex l	85%		% du total mondial	71%	

Groups	**total emissions**	**% du total mondial**	**t CO_2 par habitant**
world #	22 726	na	3,87
Parties included in the Annex l	13 383	59%	11,00
Parties included in annex ll	10 792	47%	12,00
EU	3 171	14%	8,47
TEM Parties	2 592	11%	8,18
Parties non- included in annex	8 622	38%	1,85

Note : the world includes all the parties listed in the UNFCCC [33] and all countries not included.

Source[34]

Activities resulting from the oil, gas and coal extraction process contribute indirectly to greenhouse gas emissions, as described below.

[33] United Nations, United Nations Framework Convention on Climate Change

[34] IEA, CO2 Emissions from Fuel Combustion 1971-1998, Paris, 2000, cited in UNEP and UNFCCC: « *Climate Change Fact Sheet*», available in electronic version on https://unfccc.int/resource/docs/publications/infokit_2001_fr.pdf; accessed 31 August 2020, page 30..

B. Indirect role of fossil fuels in increasing the greenhouse effect and thus in global warming

As written in the study « *Documenting the impact of export credit agencies in Uganda, Nigeria, Togo and Ghana in the energy sector* », activities linked to the exploitation of fossil fuel deposits have forced some populations who have not received adequate compensation to leave their land to settle in a protected area which they use to cultivate their fields (the case of Uganda, for example). This causes deforestation. But we know that forests have an important role, that of carbon sequestration.
Indeed, "*forests play an important role in the climate system. Forests are an important carbon reservoir, containing about 80% of the total carbon stored in terrestrial vegetation and some 40% of the carbon in soils. Large amounts of carbon are likely to be emitted into the atmosphere when one type of forest is replaced by another and if mortality releases carbon faster than renewal and growth absorb it. Forests also have a direct impact on local, regional and continental climate by affecting ground temperature, evapotranspiration, soil permeability, albedo (or reflectivity), cloud formation and precipitation. »*[35]

Ultimately, by destroying these forests, people contribute to exacerbating climate change because not only do they prevent forests from playing their role of carbon sequestration, but they also promote greenhouse gas emissions, responsible for global warming, due to land use and change of land use (trees that are cut down and then burned).

The reasoning is as follows: "*20% of greenhouse gas emissions due to human activities come from forest degradation. This deforestation is both a cause and a consequence of climate change. Large forested areas are carbon sinks that store carbon dioxide and cool the air. Under the effect of the sun, the water absorbed by the trees evaporates, creating water vapour. Clouds form, creating new rainfall. Deforestation interrupts this process and deprives the atmosphere of this cooling effect, creating a vicious circle that accentuates climate change.»*[36]

The effects of the promotion of fossil fuels in the aggravation of climatic events are now known. They are already influencing the lifestyles of human societies and disrupting wildlife. These effects are expected to intensify over the coming decades. We can mention the advent of extreme weather conditions, changes in rainfall and their consequences.

While global warming causes glaciers and polar ice caps to melt, the warming of water causes it to expand. Together, these changes cause sea levels to rise, which in turn leads to flooding and coastal erosion.

Heavy rainfall and other extreme weather events are becoming more and more frequent, as we can see on all continents. They can cause flooding and affect water quality, but also

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[35] UNEP and UNFCCC: "*Climate Change Fact Sheet*", available in electronic version sur https://unfccc.int/resource/docs/publications/infokit_2001_fr.pdf; accessed 31 August 2020.
[36] WWF France, « *Understanding the impact of forests on the climate*» 25/09/2012: https://www.wwf.fr/vous-informer/actualites/comprendre-limpact-de-la-foret-sur-le-climat#:~:text=20%25%20des%20%C3%A9missions%20de%20gaz,carbone%20et%20rafra%C3%AEchissent%20l'air., accessed 31 August 2020.

reduce the availability of water resources in some parts of the world. They cause loss of life, destruction of development infrastructure and thus undermine the foundations of human life.
Some regions of the world are facing an increase in heat waves, forest fires and droughts. Still others are becoming increasingly vulnerable to droughts. Large cities are exposed to high winds, floods and rising sea levels, while they are generally unprepared to adapt to climate change, especially in poor countries.

The impacts of climate change are very harmful not only to humans but also to wildlife. Warned of the damage caused by tsunamis and other climate change-related disasters, people are under constant stress and are on the alert, particularly because of threats to their health.

1. Increasing risks to human health

It should be noted that:

- Heat-related deaths have increased in some parts of the world;
- There is a (rising) trend in the distribution of certain water-borne diseases and disease vectors;
- There is also an increase in loss of life due to flooding.

Furthermore, it was noted that the negative social and economic impacts of the use of dirty energy are also to be noted in social and economic terms.

2. High social and economic costs

Damage to property and infrastructure and effects on human health have very high socio-economic costs.
It was noted that "*between 1980 and 2011, the floods affected more than 5.5 million people and caused direct economic losses amounting to more than 90 billion euros*".[37]
As a result, sectors such as agriculture, forestry, energy and tourism, which are highly dependent on temperature and rainfall, are severely affected.
Despite its high resilience to shocks, wildlife and plant resources are very poorly able to withstand the impacts of global warming.

3. Consequences for wildlife

As far as wildlife is concerned, many plant and animal species are struggling to adapt to the speed at which climate change is occurring. Also *many terrestrial, freshwater and marine*

[37] European Commission, « *The effects of climate change* »
https://ec.europa.eu/clima/change/consequences_fr#:~:text=Les%20calottes%20glaciaires%20polaires%20fondent,de%20plus%20en%20plus%20extr%C3%AAmes, article consulted on August 31, 2020

species have already moved to new territories. Some plant and animal species will be at serious risk of extinction if the average temperature of the planet continues to rise unchecked.[38]

The consequences listed above explain why the world's citizens, of various persuasions, are mobilising to fight the expansion of fossil fuels and their corollary, climate change.

IV. SUCCESSES IN THE FIGHT AGAINST FOSSIL FUELS: MOBILISING CIVIL SOCIETY ORGANISATIONS, LOCAL COMMUNITIES, ACTIVISTS AND ACADEMIA AGAINST FOSSIL FUELS

History shows that struggles for positive change have had varying degrees of success; some have been successful, others have encountered obstacles. Fighting the fossil fuel industries is no easy task, but some of them deserve to be highlighted for their impact or for their symbolism.
We can note struggles on different scales and in different ways.

To begin with, we will talk about community-led struggles (A).

A. Community-led struggles

The cases of the Amazon citizens in Latin America (1) and of the Ogoni people in West Africa (2) should be mentioned as examples.

These are two examples of inspiring struggles: on the one hand, they testify to the stubbornness of multinationals to persevere in their drive to prey on the natural resources belonging to other peoples, to the detriment of the rights of the latter, and on the other hand, to the anger of communities to defend their dignity whatever the cost.

1. Citizens in the Amazon are mobilising to denounce the damage to the environment and the health of the populations, after the oil exploitation of Texaco-Chevron.

One of the struggles against the fuel industries was reported by Sabah Rahmani in an article entitled "*30,000 citizens against the oil giant Texaco: the story of a long struggle*" and published[39] April 18, 2019.

With 300 wells drilled between 1967 and 1993, 60 million litres of oil abandoned and 79 million litres of toxic residues dumped in the primary forest, Texaco has generated

[38] *idem*
[39] Sabah Rahmani, 18/04/2019, *Citizen movements, 30,000 citizens against the oil giant Texaco: the story of a long struggle »* https://kaizen-magazine.com/article/30-000-citoyens-contre-le-geant-petrolier-texaco-lhistoire-dun-long-combat/, consulted on 2 September 2020

Sabah Rahmani is a journalist with a degree in anthropology. She has been working on the issue of root peoples for more than twenty years. She has carried out numerous reports with indigenous communities. Her favourite subjects concern the relationship between humans and nature.

pollution equivalent to 3,000 times the Erika spill. One of the worst environmental disasters on the planet, sometimes referred to as the "Amazonian Chernobyl". The consequences on the environment are such that they have affected the health of the inhabitants, who are exposed to numerous cancers.

Disaster-affected communities have managed to join forces in this difficult battle. « *Our union is a real success. We respect and learn from each other in order to better fight together. Because we believe that we will not succeed if the citizens themselves do not participate in this reparation.»*, explained lawyer Pablo Fajardo. [40]

After long years of proceedings, demonstrations, power struggles and intimidation of the oil tanker, the Ecuadorian justice system will finally prove them right. In 2011, it orders Chevron to pay a record $9 billion in reparations, damages and interest. This is an unprecedented judgment in the citizen's struggle against a multinational corporation. The feeling of victory however is short-lived, because Texaco has since refused to pay the fine. An unprecedented legal battle ensues between the two parties; two visions of the world, nature and mankind. An abyss separates them. A few days before the judgment in Ecuador, Chevron even filed a complaint against the Ecuadorian side, claiming that *« the plaintiffs used Mafia methods to extort money from a very rich company»*[41].

Demonstration against Texaco

« *I sincerely believe that it is difficult to obtain reparation because those leading the struggle are Indians and Ecuadorians. If the victims had been North Americans or Europeans, the company would have been forced to pay… This is a real problem, because it is also indicative of a racist mentality. An American lawyer for the multinational company himself admitted this when he said, "We cannot accept that a small country should annoy such a big company as Texaco-Chevron* », analysed Pablo Fajardo.

The fight against impunity continues unabated on a global scale. As early as 2012, the plaintiffs have filed lawsuits in the courts of Canada, Argentina and Brazil to enforce the sentence where the company has subsidiaries. These courts eventually declared themselves incompetent to conduct a lawsuit against the parent company: Chevron Corporation in the United States. In 2014, the Ecuadorian coalition will file a complaint with the International Criminal Court against Chevron's CEO for "crimes against humanity", in view of his refusal to clean up the soil in the Amazon. This will also be rejected in 2015.

[40] Idem
[41] Ibidem

Even if the legal battle is long, lawyer Pablo Fajardo continues to believe in it and remains convinced that they will obtain reparation. « *Because it's right. And I believe that no crime can go unpunished forever. In our case, I believe it is possible. Yes! We have fought so hard, I can't believe that we are not going to succeed one day. We are convinced of this, even though we are aware that it is not easy. But we are also aware that it is possible* »
The second case of a community-wide struggle is the one between the Ogoni people and the oil company Royal Dutch Shell and the Nigerian government.

2. Movement for the Survival of the Ogoni People [42]

The first discovery of oil on the Ogonian lands dates back to 1958. The environmental destruction caused by oil extraction on Ogonian land and a lack of sharing of oil wealth resulted in opposition from the indigenous people during the first oil extractions. Internationally, the first Shell boycotts due to abuses in Nigeria date back to the 1960s.

The « *Movement for the Survival of the Ogoni People*[43] *(MOSOP)* », was created in 1960 by several personalities from the Ogoni community, including Ken Saro-Wiwa, president at the time of the *Ethnic Minority Rights Organization of Africa*. The latter will become the main leader of the movement thereafter.
The aim is to defend the interests of the Ogoni people in the face of abuses committed by the oil company Royal Dutch Shell and the Nigerian government. MOSOP's early efforts culminated in a declaration called the Ogoni Bill of Rights addressed to the Nigerian government in 1990.
The statement identifies various community concerns such as the destruction of the Ogoni environment due to oil extraction, the neglect of the federal government, the lack of social services and the political marginalisation suffered by the community.

The MOSOP self-defines the Ogoni as an "ethnically distinct nationality" and thus demands from the Nigerian government some autonomy, environmental protection, a fair share of revenues from resource extraction on their land and cultural rights such as the use of their own language.

Influenced by the philosophy of its leader Ken Saro-Wiwa, MOSOP uses non-violent methods to put pressure on the Nigerian government. However, from December 1992 onwards, the conflict became, at times, violent. At that time, seeing Shell's record profits from the natural wealth of the Ogonian lands, MOSOP gave an ultimatum to the oil companies (Shell, Chevron and the *Nigerian National Petroleum Company*), demanding $10 billion for accumulated damage, an "immediate halt to environmental degradation" and negotiations on possible future extractions.

In this ultimatum, MOSOP threatens to hold mass demonstrations and block the activities of the oil companies. From that moment on, MOSOP began to target the oil companies as well, and not just the Nigerian government as it did before.

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[42] Wikipédia, page updated on 18/08/2020, https://fr.wikipedia.org/wiki/Mouvement_pour_la_survie_du_peuple_ogoni, consulted on 02/09/2020
[43] Idem

The Nigerian government is responding to MOSOP's statements by banning all gatherings and declaring that any action hindering oil production would be an act of treason. MOSOP succeeds in organising a major non-violent demonstration on 4 January 1993. The event, which occurs on a bank holiday, attracts 300,000 people. It is the biggest mobilisation in the history of the Ogoni people.

This mobilisation continued for more than a month and, after some violent actions committed by some MOSOP members, resulted in the withdrawal of SPDC employees from the Ogoni lands for security reasons. Oil extraction has been severely slowed down as a result. However, the withdrawal is only a temporary measure and, according to MOSOP, it gives the Nigerian government a good reason to restore order on Ogoni land. The government is quickly allowing companies to return to extract oil.

Military repression accelerated from May 1994. On 21 May, the Nigerian army and police appear in most Ogoni villages. On the same day, four of the MOSOP leaders are assassinated. Ken Saro-Wiwa is banned from entering Ogoniland and then imprisoned by law enforcement officials, accusing him of involvement in the killings of other MOSOP members. On the same day, Lieutenant-Colonel Dauda Komo accused Ken Saro-Wiva of the murder of the four MOSOP elements.
Major Paul Okuntimo, leading the "restoration of order" operation, said he was looking for those directly involved in the assassination of the four Ogoni. Witnesses said they saw the security forces carry out terror operations against the Ogoni people on the same days. Amnesty International described these operations as deliberate terrorism. By mid-June, 30 Ogoni villages were destroyed, 600 people imprisoned and at least 40 people killed.
Ken Saro Wiwa was imprisoned several times without trial until 1995 when he was imprisoned, tried and executed on 10 November.
In the 2000s, MOSOP became less important in Nigeria as other more radical groups such as the Movement for the Emancipation of the Niger Delta (MEND) took the lead in the fight against oil companies in Nigeria.

Several NGOs such as Amnesty International have denounced this trial and the attitude of General Sani Abacha's government towards the peaceful demonstrations. The role of Shell in the arrest of Saro-Wiwa has also been heavily criticised. Nearly 2,000 people have been killed since 1993 by the army, many villages have been destroyed, about 100,000 Ogoni have gone into exile in Benin. Some Ogoni have also been welcomed in Canada and the United States. These abuses resulted in Nigeria's expulsion from the Commonwealth of Nations in 1995, but some complain about the lack of action by the international community. Nigeria was reintegrated into the Commonwealth in 1999.
After withdrawing from these lands for security reasons, Shell sometimes tries to return there to extract oil. In April 2005, one of the Ogoni communities, called Agip Waterfront, was destroyed to facilitate the expansion of the Nigerian Agip Oil Company (NAOC). One Ogoni was killed in the action. According to Amnesty International's November 2005 report, the situation has not improved for the Ogoni people despite the change of government in Nigeria. According to several sources, Shell is still alleged to have committed some abuses in 2006.

This situation is similar to other oil-producing regions in southern Nigeria. Other fighting continues between oil companies and indigenous peoples in southern Nigeria (Bonny Island).

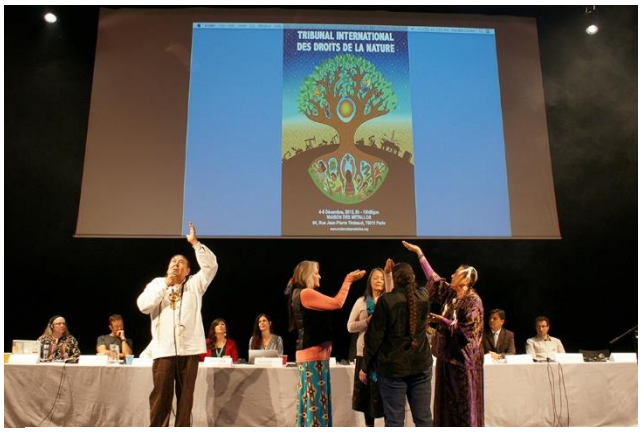
Many alterglobalists have expressed their support for the Ogoni peoples. They often denounce the lack of action against abusive multinationals. In her book, *No Logo*, Naomi Klein has described Shell's withdrawal from Ogoni territories under local and international pressure as one of the first major successes of the anti-globalisation movement against the growing power of the multinationals.

There is also documentation of people's struggles in collaboration with experts and environmental activists (B).

B. Struggles led by indigenous peoples, experts and environmental activists

In an article entitled "an international tribunal to preserve nature", Thomas Masson, a journalist and poet, reported [44] on a case of the fight against the degradation of the planet by multinationals. It concerns the holding of the 3rd edition of the International Tribunal for the Rights of Nature from 4 to 5 December 2015, on the sidelines of COP21 in Paris, France.

It is a trial "played as in a theatre play", which brought together indigenous peoples, experts and defenders of the sanctity of the Earth on the one hand, and governments and corporations on the other. The latter were tried in their absence. Their benches were empty, and no lawyer defended them or presented evidence to prove their innocence. This court was above all symbolic.



© Thomas Masson

Photo during the trial

[44] Thomas Masson, https://kaizen-magazine.com/article/un-tribunal-international-pour-preserver-la-nature/, accessed, on 02/09/2020

At the initiative of the Global Alliance for the Rights of Nature, the International Tribunal for the Rights of Nature wants to establish an international legal framework to protect ecosystems and to qualify any violation of the Universal Declaration of the Rights of the Earth[45] as a crime of ecocide. It is with this in mind that it has organised this third edition.

Thomas Masson said that the complainants, José Bové, Chief Kayapo (Brazil), Raoni Metuktire gave a poetic speech about the planet. They spoke of a "living Earth", a "living organism" and a "Mother Earth". Rivers, forests, soils and living beings were described as sacred and animated by spirits.

They denounced crimes against nature, pointing in particular to fossil fuels, deforestation, privatisation and water pollution, free trade agreements, nuclear power, extractive mining, the financialisation of nature, the expulsion of people from their lands, and the irresponsibility of governments and companies. They spoke of nature being "scorned and exploited", a planet "in crisis" and a "climate emergency".

They also decried the "madness of capital and power", calling on governments to stop selling concessions to companies and let local communities regain the power to decide.

During the pleading, Maxime Combes (France, Attac) described fossil industries as "the number one enemy of nature and the adversary of humanity". He called for at least 80% of fossil fuels to be left in the ground. Speaking of oil companies, Desmond D'Sa (South Africa, SDCEA) called them petrochemical industries with a "thirst for profit" and considering the earth as "a toy".

Maude Barlow (Canada, The Council of Canadians), speaking about the management of water resources, said that water has become "over-exploited and polluted"; for Maude, it should no longer be considered "as a market good" but as "a divine gift". Tony Clarke's (Canada, Polaris Institute) regret is that nature is seen as "capital" and a "dead organism".
At the end of the pleadings, the judges deliberated. The first of their recommendations is to ensure that the Rome Statute makes it possible to prosecute those responsible for ecocide crimes before the ICC (which has the power to judge international crimes against humanity, war crimes and genocide).

The Ecuadorian government has been held accountable for the criminalisation of conservationists. The court condemned the construction of the Belo Monte and Tapajós dams.

The judges stated that the Chevron case (spilling billions of litres of oil in the open air in Ecuador and Brazil) "is one of the worst ecocide cases ever perpetrated in the Amazon" and that "restorative justice must be applied without delay".
It is also noteworthy that struggles have been initiated, mainly by non-governmental organisations (C).

[45] PORTAIL Rio+20, 04/01/2012, http://rio20.net/fr/propuestas/declaration-universelle-des-droits-de-la-terre-mere/, consulted, on 02/09/2020.

C. Struggles led by non-governmental organisations

The Norwegian State assigned on the basis of the Constitution[46]

Two Norwegian NGOs, Greenpeace Norway and Nature and Youth, attacked their government following a surprising decision: only one month after signing the Paris Agreement, in April 2016, the state opened a new area in the Barents Sea, between the Arctic Ocean and the European continent, to oil exploitation. It has provided licences to thirteen companies from different countries. Statoil, controlled by the Norwegian state, has already started exploitation.
"From a constitutional point of view, the State has a duty vis-à-vis its population to protect the environment. Not the companies that have obtained these licences.", developed Trust Gulowsen, from Greenpeace Norway. « … *Legally, our complaint is based on the Norwegian Constitution. We consider the new Arctic oil licenses to be illegal, as they will lead to exceeding Norway's carbon emission levels, as allowed by the Paris Agreement. »*

Voted in 2014, it states that "*everyone has the right to a healthy environment*", and that "*natural resources must be managed on the basis of long-term considerations that also safeguard the rights of future generations*. "The paragraph adds that "the State must take measures to implement these principles".

Another form of collaboration, this time between environmental movements and local and regional authorities, has proved its worth (D).

D. Struggle led by ecological movements and local authorities

In France, since the beginning of 2019, companies have been required to comply with their vigilance plan before the courts[47]. This is in accordance with Law n° 2017-399 of 27th March 2017 relating to the duty of vigilance of parent companies and ordering companies (Due Diligence Law). This law, which is unique in the world, commits the parent companies of multinationals present in France to publish a vigilance plan mapping the environmental and human risks related to their activities, as well as those of their subsidiaries and subcontractors.

More concretely, the « *The Duty of Vigilance Act introduces into the Commercial Code a duty of vigilance, a legal obligation of prudent and diligent behaviour, for which the parent companies of groups employing at least 5,000 employees in France or 10,000 employees worldwide are liable. For them, this duty of vigilance consists of establishing, effectively implementing and publishing*

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[46] KAIZEN, « *The Norwegian State assigned on the basis of the Constitution*» 27/03/2018, https://kaizen-magazine.com/article/menaces-rechauffement-de-plus-plus-de-villes-leurs-habitants-attaquent-justice-gros-pollueurs/, consulted on 02/09/2020

[47] Aude Massiot, « *Total under formal notice for human rights violations*» ; 25/06/2019, https://www.liberation.fr/planete/2019/06/25/total-mis-en-demeure-pour-violation-des-droits-humains_1736046#:~:text=Dur%20mois%20pour%20Total.,sur%20le%20devoir%20de%20vigilance.&text=Depuis%20d%C3%A9but%202019%2C%20les%20entreprises,du%20respect%20de%20leur%20plan., consulted on 02 September 2020.

"reasonable vigilance measures to identify risks and prevent serious violations of human rights and fundamental freedoms, human health and safety and the environment"[48]»

Aude Massiot, journalist at Libération was able to write « *Hard month for Total. In ten days, the oil and gas multinational has twice been served formal notice in France for failing to comply with the law on the duty of vivgilance* [49] ».

Total is thus subject to two procedures initiated in France. The first, which denounces their participation in climate change through their oil activities, was launched on 18 June 2019 by thirteen French local authorities and the associations Notre Affaire à Tous, Les EcoMaires, Sherpa and ZEA.

The second, initiated by the NGOs Survie and Friends of the Earth, blames the multinational for human rights violations carried out in Uganda by its subsidiary Total Uganda. Total plans to drill 419 oil wells in the Murchison Falls Protected Natural Area to produce nearly 200,000 barrels of crude per day[50].

Action for international regulation on the duty of vigilance

At the international level, a binding treaty to prevent human rights abuses by multinational companies is being developed under the auspices of the UN. *Although it is the result of a resolution by Ecuador, it does not have the favour of all countries. France plays only an observer role and the European Union is absent from it.* [51] In July 2019, the ad hoc working group published the second draft, focusing on the duty of vigilance and corporate liability for breaches committed by companies.

We hope that a binding treaty will eventually result to enshrine the accountability of multinationals.
Organizations such as: Action Aid France/Peuples Solidaires, Association Internationale de Techniciens, Experts and Chercheurs (AITEC) CCFD – Terre Solidaire, CGT, Collectif Ethique sur l'Etiquette, Sherpa, Les Amis de la Terre International are working hard on it.

It is not uncommon to come across people who are sufficiently committed and courageous to take up the struggle on their own (E).

E. Fight led by a person

The present court case was documented by Violette Bonnebas, a freelance journalist for the ecology daily Reporterre, since 2015, who published on 1 December 2017, an article[52]

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[48] Sherpa, « *Reference Guide for Vigilance Plans" available at* https://www.asso-sherpa.org/wp-content/uploads/2018/12/Sherpa_VPRG_web_pageapage-min.pdf , p9, consulted on 10/09/2020
[49] Op.cit. Aude Massiot
[50] La Croix, Laurent Larcher, https://www.la-croix.com/Monde/Afrique/Total-Ouganda-six-ONG-sinsurgent-2019-06-25-1201031348, published, 25/06/2019, accessed 05/10/2020
[51] Sabine Gagnier, https://www.novethic.fr/actualite/gouvernance-dentreprise/entreprises-controversees/isr-rse/ces-entreprises-qui-bafouent-les-droits-humains-143846.html, published on 24 February 2016, accessed on 05/10/2020
[52] Violette Bonnebas, « *Climate, a world first in Germany: complaint against a large company is deemed admissible*», 01/12/2017, https://reporterre.net/Climat-une-premiere-mondiale-en-Allemagne-la-plainte-contre-une-grande#:~:text=Un%20tribunal%20allemand%20a%20jug%C3%A9,gaz%20%C3%A0%20effet%20de%20serre., consulted on 02 September 2020.

on the said daily newspaper under the title « *Climate, a world first in Germany: complaint against a large company is deemed admissible*».

Indeed, a German court has ruled "admissible" the complaint of Saúl Luciano Lliuya, a Peruvian peasant farmer against the energy company RWE, which he blames for global warming in the Andes. This "historic" decision opens a legal loophole against companies that emit greenhouse gases.

Violette Bonnebas said that on Thursday 30 November 2017 the German courts agreed to examine the claim of Saúl Luciano Lliuya, a Peruvian farmer, against the German energy company RWE. Saúl wants to force the company to pay for the damage caused by the effects of climate change in his native Andean region.
His application was dismissed at first instance and was finally deemed "admissible" by the Hamm Court of Appeal.
This decision does not mean that the judges agree with Lliuya, who accuses RWE, Europe's largest CO2 emitter, of being responsible for the melting of a glacier that threatens his city of Huaraz, Peru. But it marks a first step towards what environmental groups are calling "global climate justice", whereby the highly polluting countries of the North would be forced to repair the damage suffered by the countries of the South, which are largely affected by the pollution they cause and global warming[53].

Saúl Luciano Lliuya at the entrance to the Peruvian valley of the Cojup River. The river comes from Lake Palcacocha, dominated by the Pucaranra glacier.

« The mere fact that an investigation has been opened in this case is writing a page in the history of the law', welcomes Saúl Luciano Lliuya's lawyer, Roda Verheyen. « For the first time, a court has affirmed the principle that a private company is responsible for the climate damage it contributes to," says the NGO Germanwatch in a statement. According to Roda Verheyen, Germany is one of the fifty countries in the world whose law on the infringement of private property allows such a judgment.

[53] Idem

It should be noted that in the case, Saúl Luciano Lliuya and his lawyer are claiming a participation of 20,000 euros from the company RWE. *« We chose to charge only a portion of the costs because the company alone is not responsible for all GHG emissions»*[54], says the lawyer.

In the previous lines, we have explained, among other things, that fossil fuels are the main sources of global warming, and that there are huge inequities associated with their exploitation.

These include: the spoliation of people's living resources, the degradation of morals, the dislocation of the social fabric and poverty (heads of families losing their authority following the extortion of their property), the violation of human rights, the pollution of natural resources (depriving people of drinking water, their living environment, etc.), the erosion of biodiversity, violent conflicts (often with loss of human life), in short, the compromise of the future of humanity. That said, alternative energies should be adopted; those that are clean and renewable.

PART TWO : GOOD PRACTICES IN TERMS OF RENEWABLE ENERGIES

[54] KAIZEN, « *Peruvian peasant's complaint accepted in Germany»,* 27/03/2018 https://kaizen-magazine.com/article/menaces-rechauffement-de-plus-plus-de-villes-leurs-habitants-attaquent-justice-gros-pollueurs/, consulted on 02/09/2020

In this second part, we will look at why it is important to adopt renewable energy (I), and give examples of clean energy use (II), including demonstrating that communities are involved and benefit from it (III). Finally, good practices in clean energy will be presented (IV).

I. THE RATIONALE FOR THE ADOPTION OF RENEWABLE ENERGIES

Dealing with this subject means giving the reasons why it is appropriate to support renewable energies. In fact, when analysed, renewable energies have many advantages: they are inexhaustible on the human time scale, and are environmentally friendly and safe. « *Unlike fossil fuels, renewable energies emit very few greenhouse gases: according to IPCC data*[55]*, to produce 1 kWh of electricity with wind turbines, only 11 g of* CO_2 *is emitted, almost 75 times less than with coal, which emits around 820 g of* CO_2*!* ».

While "for oil it is estimated (thanks to BP's statistical reviews[56]*) that proven reserves could allow us to last only about 50 more years at the current consumption rate,... on the contrary, renewable energies rely on the sun or the wind, which are not about to be exhausted* ».

Whether to protect the planet or to anticipate the future, there are many reasons to adopt renewable energies. But then, by way of illustration, what are some examples of the use of renewable energy?

II. EXAMPLES OF CLEAN ENERGY USE

The use of running water, wind, wood and, to a lesser extent, the sun, as sources of energy is as old as the world itself. [57] Under this heading, we will add the heat stored in the basement. Thus, in the following lines, we will try to describe the ways in which wind (A), solar (B), hydraulic (C), biomass (D) and geothermal (E) energy is used.

A. Wind energy

[55] Bruckner T., I.A. Bashmakov, Y. Mulugetta, H. Chum, A. de la Vega Navarro, J. Edmonds, A. Faaij, B. Fungtammasan, A. Garg, E. Hertwich, D. Honnery, D. Infield, M. Kainuma, S. Khennas, S. Kim, H.B. Nimir, K. Riahi, N. Strachan, R. Wiser, and X. Zhang, 2014: Energy Systems. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA., « Energy Systems », available at : https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter7.pdf, accessed on 03/09/2020

[56] Bp,https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/oil.html#oil-reserves, accessed on 03/09/2020

[57] Rémy Prud'homme, *Le mythe des énergies renouvelables : quand on aime on ne compte pas,* L'artilleur, septembre 2017, 320 pages

According to the Larousse online dictionary, wind energy is *a system with rotating wings or blades that converts the kinetic energy of the wind into mechanical energy available on a shaft to drive a machine (pump) or an electric alternator*[58].

Wind energy can be used in three ways:

- - With conservation of mechanical energy: the wind is used to propel a vehicle (sailing ship or sand yacht) or to turn a millstone. ;
- By transforming it into a driving force (pumping liquids, compressing fluids, etc.): pumping water (Mallorca mills, pumping windmills for irrigating fields or watering livestock);
- By the production of electrical energy: the wind turbine is coupled to an electrical generator to produce direct or alternating current.

The generator is connected to an electrical grid or operates as part of a "stand-alone" system with a back-up generator (e.g. a generator set) and/or a battery bank or other energy storage device.
The advantages associated with the use of wind energy should be presented.

1. Advantages

Wind energy has many advantages. They include:

- Wind energy is a renewable energy that requires no fuel, does not emit greenhouse gases and does not produce toxic or radioactive waste. By combating climate change, wind energy contributes, in the long term, to maintaining the biodiversity of natural environments.;
- Wind energy produces electricity: without degrading air quality, without polluting water (no discharge into the aquatic environment, no thermal pollution), without polluting the soil (no soot or ashes).
- When large wind farms are installed on agricultural land, only a small amount of soil space is required. The remaining area is available for farming, animal husbandry and other uses.[59].

In spite of its acknowledged advantages, the use of wind energy has some constraints.

2. Disadvantages

Wind energy has some limitations which can be summarised as follows:

- Wind power is an intermittent energy source, it is not in itself sufficient to define an energy and environmental policy, the solution would be to couple wind power with photovoltaic solar panels.;
- Wind energy has effects on the landscape (aesthetics), noise problems (mainly noticeable with wind turbines imported from Asia), problem of electromagnetic interference for low-end wind turbines[60].

[58] Larousse.fr, https://www.larousse.fr/dictionnaires/francais/%C3%A9olienne/30193, consulté le 03/10/2020
[59] ECOinfos, renewable energies, page updated on 9/01/2020, https://www.les-energies-renouvelables.eu/conseils/eolienne/avantages-inconvenients-eolienne/, consulted on 09/09/2020

Moulins dans la région de La Mancha, en Espagne,
Source : Wikipédia

B. Solar energy

Solar energy for cooking food

Solar cooking, which appeared in the 1970s, consists of preparing dishes using a solar cooker or oven. Small solar ovens allow cooking temperatures of around 150°C, and solar parabolas allow you to prepare the same dishes as a conventional gas or electric cooker.

The use of solar energy for cooking, apart from being free and abundant in certain geographical areas, also helps to reduce deforestation in some countries where cooking with wood and charcoal is the norm. At the same time, it also reduces CO2 emissions into the atmosphere, by around four tonnes of CO2 per year for an African family cooking with wood, for example.[61]

While the use of solar energy is attracting more attention on all continents, we should ask ourselves about these real assets.

1. Advantages

The use of solar energy offers definite advantages:

- Solar energy is inexhaustible and non-polluting.;
- Energy is clean and does not emit greenhouse gases.

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[60] ECOinfos, renewable energies, page updated on 9/01/2020, https://www.les-energies-renouvelables.eu/conseils/eolienne/avantages-inconvenients-eolienne/, consulted on 09/09/2020

[61] Wikipédia, page updated on 18/08/2020 https://fr.wikipedia.org/wiki/%C3%89nergie_%C3%A9olienne#Utilisation, consulted on 09/09/2020

- It is a completely silent source of electrical energy, unlike wind turbines.;
- The energy efficiency is positive: it takes on average between 3 and 4 years for the panel to produce the energy required for its manufacture. A solar panel produces, on average, between 9 and 14 times the energy used in its manufacture.

It is important to note that solar energy is not to arouse some reservations because of its shortcomings.

2. Disadvantages

There are a few cautions that limit the benefits associated with solar energy. Indeed:

- The investment cost of a solar thermal system is relatively high.;
- L'énergie solaire est une énergie intermittente.
- The production of solar energy is only possible when there is sunshine.
- The lifespan of a photovoltaic installation is in the order of 20 to 30 years. The efficiency of photovoltaic cells decreases over time.
- Solar panels contain toxic waste: copper, chromium, silicon, cadmium and tellurium.

Source[62]

Solar cooker

C. Hydropower

Hydraulic energy is supplied by the movement of water, in all its forms: waterfalls, rivers, sea currents, tides, waves, etc. This movement can be used directly, e.g. with a water mill, or be converted, e.g. into electrical energy in a hydroelectric power station.
Hydraulic energy can be converted directly into mechanical energy, e.g. by using the force of the water in a stream to turn the wheel of a water mill or a noria, but also to

[62] Google.com, https://www.google.com/url?sa=i&url=http%3A%2F%2Finstitut-tsa.org%2F&psig=AOvVaw19EeJ5hTwB1pCpRMCkrH7X&ust=1599753064267000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCPjBlPHC3OsCFQAAAAAdAAAAABAZ, consulted on 09/09/2020

make pulp. It can also be converted into electrical energy to illuminate a given environment by means of an electric light bulb.

Hydraulic energy has great advantages, which explains the enthusiasm for its use.

1. Advantages[63]

It is worth mentioning that hydropower is green and non-polluting.
The production of electricity from hydropower does not pollute by itself. Energy is produced by the passage of water, but no additives are added and nothing changes the composition of the water. The only pollution occurs during the construction of these massive power plants. L'énergie hydraulique est fiable et sure.

Hydropower is a reliable energy source. There is little fluctuation in the electrical energy supplied by the plants. As long as there is water in the rivers, electricity can be produced. Compared to, among others, fossil fuels and nuclear energy, hydropower is safer.

Hydraulic energy is flexible. It is easy to adjust the water flow and electricity production. When energy consumption is low, water flow is reduced and reservoir levels are maintained for periods when energy consumption is high.
Despite these advantages, there are a few constraints.

2. Disadvantages [64]

The environmental consequences of hydropower are related to interventions in nature due to the construction of dams, the modification of water flow and the construction of roads and power lines. The construction of dams often requires the displacement of populations, loss of land, loss of vegetation cover, etc. The construction of dams often requires the displacement of populations, loss of land, loss of vegetation cover, etc.

Hydroelectric power plants can affect fish and their behaviour, particularly with regard to reproduction. There is a complex interaction between many physical and biological factors.

Fish habitats are shaped by physical factors such as water level, water speed, shelter and access to food. Drying out during construction is completely devastating for fish. In addition, the amount of water can have different effects on the fish in a river, depending on the type and stage of the life cycle.

Hydraulic energy is expensive. The construction of hydropower plants is expensive. However, these plants are not labour intensive and maintenance costs are generally low.
The impact of weather on hydropower. Electricity production and energy prices are linked to the amount of water available. In case of drought, it is necessary to wait for rain upstream.

During the construction phase of the dam, various debris can pollute the water.

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[63] Erwin Barbé, https://www.controle-electrique.be/actu/avantages-et-desavantages-de-lenergie-hydroelectrique/, consulted on 09/09/2020
[64] Idem

Nangbeto Dam, Togo

Source[65] :

D. Energy from biomass

Biomass energy is a source of energy that depends on the cycle of living plant matter (including micro-algae) and animal, bacterial or fungal matter that can be used as a source of energy. It is the oldest form of energy used by man since the discovery of fire in prehistoric times.
Two types of biomass are used: dry biomass and wet biomass.

Dry biomass

Wood and its derivatives (logs, pellets, chips, etc.), and dry bark.

They are used as fuel in boilers, to cook food, for heating, etc. We talk about wood energy.

Wet biomass [66]

Manure and sanitary sludge
Animal excrement mixed with litter is also a form of biomass. Just like sanitary sludge from toilets. The fermentation gases released from these materials are used for heating or electricity generation. This is called biogas.

Vegetable waste
Plant waste that forms compost, such as kitchen peelings or garden waste, can also be used to produce biogas. It is possible to produce energy from most biodegradable waste:

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Google.com,https://www.google.fr/url?sa=i&url=https%3A%2F%2Flandportal.org%2Ffr%2Fnews%2F2017%2F04%2Ftogo-les-riverains-du-barrage-de-nangb%25C3%25A9to-victimes-de-promesses-non-tenues&psig=AOvVaw3aL-oA2z0uHBVcKYnydkd7&ust=1599755636192000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCND2vbLA3OsCFQAAAAAdAAAAABAD, consulted on 09/09/2020

66 Energy explorers, https://www.explorateurs-energie.ch/les-9-energies/la-biomasse/, consulted on 09/09/2020

kitchen (compost) and garden peelings, sanitary sludge (toilets, showers), agricultural waste or waste from the food industry; etc. Some plants can also be transformed into fuel, in which case they are called biofuels.

The question must be asked as to why the use of biomass is advantageous.

1. Advantages

Biomass energy makes use of inexpensive resources, which are available in large quantities.

Biomass is available everywhere; as waste is produced by every living species, its availability is therefore unlimited. The latter is a considerable advantage over fossil energy resources such as oil or coal.

One can legitimately ask whether, notwithstanding the potential that characterises it, the biomass has shortcomings.

2. Disadvantages

Wood from forests can quickly be exhausted if its exploitation is not controlled. To avoid depletion of available wood stocks.

The cost of biomass energy is tending to rise. The combustion or methanisation process can be expensive, with the price of the energy produced depending on the operating costs of the plants. The higher the operating costs, the more expensive the electricity produced. In addition, the cost of transporting the resources is no less, and depends in particular on the price of the fuel used for transporting the energy.[67]

Biomass is known to generate CO2, and is therefore polluting, which is a major disadvantage for biomass energy. In reality, the amount of carbon dioxide it emits corresponds to the amount of CO2 that is previously absorbed by plants, which are then used as an energy resource. It is therefore an endless cycle that occurs.

Wood and wood

Source[68]

67 : https://total.direct-energie.com/particuliers/parlons-energie/dossiers-energie/energie-renouvelable/les-avantages-et-les-inconvenients-de-l-energie-biomasse, The advantages and disadvantages of biomass energy, consulted on 05/10/2020

[68] Google.fr, https://www.google.fr/url?sa=i&url=https%3A%2F%2Fwww.bioenergie-promotion.fr%2F21473%2Fle-bois-une-energie-

Geothermal energy

The heat naturally present in the subsoil of our planet is a source of energy. The deeper we dig, the higher the temperatures we reach. The origin of this heat is twofold: on the one hand, it comes from the sun, which heats the Earth's surface; on the other hand, this heat comes from the heart of the planet, the magma, which is hot and heats the Earth's crust. The core of our planet thus constantly produces a large amount of heat.

Geothermal energy uses this heat for heating and electricity production.
There are three types of geothermal installations, all of which are used for heating. Only deep geothermal power stations can also produce electricity.

Heat pumps: surface geothermal energy for heating purposes [69]
Heat pumps use surface geothermal energy for heating. They capture heat from shallow underground, where the temperature remains below 30°C. This so-called "low temperature" geothermal energy is used to heat houses and large buildings.

In the well, a vertical U-shaped probe sends a liquid underground. This liquid is then pumped up to the surface. Its temperature is then between 10°C and 20°C. This heat is then used by a heat pump to raise its temperature. This makes it possible to heat water for the whole house: radiators, showers, taps, etc.

Hydrothermal installations: valorising hot water from the depths
There are naturally hot springs on every continent and even on the sea bed. To reach them, so-called hydrothermal installations are used.

If the deposits are located at less than 3,000 metres, we speak of mid-depth geothermal energy. The ground water then reaches 50°C-70°C and is used for heating. Deep geothermal energy, on the other hand, makes it possible to reach springs located between -3,000 metres and -5,000 metres, where the water reaches temperatures above 100°C. Overheated or in the form of steam, this water gushes out with enough pressure to power a turbine, thus producing electricity.

Petro-thermal installations: valorising the very hot rock from the depths

If there is no thermal source, it is still possible to take advantage of the heat of the subsoil, with the deep geothermal petro-thermal installations. The drilling towers dig wells from 3000 metres to 5000 metres deep, in order to install probes that penetrate the rock at very high temperatures. Liquid is then sent down into these wells, which, on contact with the naturally superheated rock, rises to more than 100°C. This liquid is then used for heating and electricity production. We can question ourselves on the inherent advantages of using geothermal energy.

1. Advantages[70]

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competitive%2F&psig=AOvVaw3rtYfWPrDzi2EgSEtc_S9w&ust=1599762193224000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCICXutTd3OsCFQAAAAAdAAAAABAD, consulted on 09/09/2020

[69] Energy explorers, https://www.explorateurs-energie.ch/les-9-energies/lenergie-geothermique/, consulted on 09/09/2020

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Geothermal energy is a clean energy (no waste to be stored). It emits few greenhouse gases and leaves no waste after use. It does not need to be disposed of, nor does it need to be stored.

Very low-energy geothermal energy is available in every basement of the planet. This makes it a more environmentally friendly form of energy that covers a large part of energy costs.

The price per kilowatt-hour is competitive. For private individuals, geothermal energy can reduce the energy bill by a third. Unlike other renewable energies, geothermal energy does not depend on weather conditions.

Like other energy sources, it is not free of constraints.

A. Disadvantages

An installation costs on average between 13,000 and 15,000 euros, including installation; the cost of drilling, sometimes deep, affects the consumer. Some geothermal energy deposits are not easily accessible.
Drilling can cause land slumps. Geothermal energy can sometimes give off low sulphur vapours if it is used in the form of water or heat. Geothermal energy is not a 100% renewable energy because it requires a generator and therefore electricity. Some heat pumps also use freon: only certain "green" fluids are allowed.

Geothermal energy exploitation infrastructure in Turkey

Source[71]

[70] ConsoGlobe, consume better live better, https://www.consoglobe.com/geothermie-avantages-inconvenients-cg/2, consulted on 09/09/2020

[71] Google.fr, https://www.google.fr/imgres?imgurl=https%3A%2F%2Fwww.redaction.media%2Fwp-content%2Fuploads%2F2018%2F01%2Fjeotermal.jpg&imgrefurl=https%3A%2F%2Fwww.redaction.media%2Farticles%2Fturquie-se-classe-quatrieme-rang-mondial-lenergie-geothermique%2F&tbnid=ieXe1Bst0SqcNM&vet=12ahUKEwiilMuA8tzrAhWW0-AKHeiOAngQMygLegUIARCzAQ..i&docid=GRwaK5iN2F9C5M&w=1440&h=900&q=%C3%A9nergie%20g%C3%A9othermique&ved=2ahUKEwiilMuA8tzrAhWW0-AKHeiOAngQMygLegUIARCzAQ, consulted on 09/09/2020

While there is no doubt that, collectively, the citizens of the world have become aware of the devastating effects of the consequences of climate change due to fossil fuels, is it equally clear that alternative energies, in this case renewable energies, have been adopted by local communities? Are they already benefiting?

III. ADOPTION OF RENEWABLE ENERGIES BY THE POPULATIONS AND BENEFITS DRAWN FROM THEM

Here we will talk about two initiatives for the promotion of renewable energies that we know of in West Africa: in Mauritania and Togo.

A. Promotion of renewable energies in Mauritania [72]

Until recently, electricity production in Mauritania was mainly based on fossil fuels. This mode of production poses the problem of the increase in GHG emissions and their consequences and, ultimately, the disappearance of these energy sources. In addition, Mauritania's energy dependence on other countries is clearly increasing. This state of affairs could slow down the country's economic growth in the more or less near future.

Following the adoption of decree 2010-245 of 15 November 2010 creating a public establishment of an industrial and commercial nature called: Agence Nationale de Développement des Energies Renouvelables (ANADER), the State has put in place an energy policy whose main thrust is the massive integration of Renewable Energy (RE) sources into the energy production system.

ANADER promotes incentive legislation to ensure the development of RE in the country over the long term.
Since then, there has been a sharp increase in the rate of electrification in rural and semi-urban areas. Seventeen towns have been electrified by networks and nearly 8,000 solar kits have been distributed; more than forty localities have been electrified by networks.
Financing has been obtained and projects launched) and 4000 solar kits are being installed (ADER and APAUS, financing obtained and projects launched). Solar and wind power plant projects are being implemented by ANADER. At the end of these projects, hundreds of thousands of citizens will have access to electricity.

The CIZO project aims to make electricity accessible to the Togolese population, particularly the rural population (thanks to individual solar kits). Ultimately, the aim is to achieve an electrification rate of 40% by 2022 (in 2018, 45% of Togolese people had access to electricity, of which only 8% in rural areas. The Rural Electrification and Renewable Energy Agency (AT2ER)[73] aims to achieve 50% access to electricity by 2022 and 100% by 2030).

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[72] A. K. Mahmoud, A. Mohamed Yahya, A. Maouloud, « Renewable energy experiences and development trends in Mauritania», *Renewable Energies in West Africa Status, Experiences and Trends*, 2012, pp 152-162, available at http://www.ecreee.org/sites/default/files/les_energies_renouvelables_en_afrique_de_louest.pdf , consulted on 10/09/2020

[73] This public institution is in charge of implementing the country's rural electrification policy, promoting and developing renewable energies.

The project aims to electrify 100,000 rural Togolese households in three years and 300,000 per year, i.e. 1,500,000 inhabitants in 5 years, through solar home kits financed in Pay-As-You-Go mode (pay-per-use).
The project also plans to equip 1,000 health centres and 3,000 small farms with individual or irrigation solar kits.

It is based on five main components:

- Setting up a national Pay-as-you-Go (PayGo) platform for managing solar kits;
- The deployment of a national granular distribution network;
- The creation of regional solar academies to train and certify local installers and technicians.;
- Subsidies for disadvantaged rural households, as well as equipment for small farms and health centres and solar water pumps;
- The setting up of a public support fund for distribution companies.

Launched on December 2, 2017, the pilot phase of the project started with the operator BBOXX, whose mission is to deploy 10,000 solar kits during this phase. By the end of 2018, more than 8,000 households will have had access to electricity thanks to the solar kits installed by BBOXX.

B. Off-grid rural electrification project for 9 localities through the supply and installation of solar photovoltaic kits [74].

Togo received support from the Conseil de l'Entente for the implementation of this project. It aims to install 350 "household" type solar kits, electrify one health centre, build, equip and electrify a community management structure and install three solar street lamps. The funds were put at the disposal of AT2ER as delegated project owner to execute the project. Given the urgency and the deadline for the project implementation, the agreement between the Conseil de l'Entente and the Togolese Government provided for a restricted consultation procedure within the framework of the project implementation.

The work was carried out during the last quarter by the companies BBOXX, SOLERGIE, GEAA-TP and the DELTA GREEN CONSULTANCY - PPS TOGO consortium.

It is worth mentioning that the production of electricity based on RE in Togo in 2018 was around 3 MW, i.e. 3% of the total production. AT2ER wants to develop Togo's RE potential by producing nearly 200 MW of RE-based electricity in 2023, i.e. 50% of total production.

AT2ER is developing more RE projects and is planning more. The institution's action has been recognised by the Ashden Awards 2020. The winners *were rewarded for their work or technological solutions that help protect the environment*.[75]

[74]AT2ER, https://at2er.tg/projet-delectrification-rurale-en-hors-reseau-de-9-localites-par-la-fourniture-et-linstallation-de-kits-solaires-photovoltaiques/, consulted, on 10/10/2020

As mentioned above, renewable energies account for approximately 20% of the world's energy consumption. The trend shows that this share is increasing over the years. RE is nowadays increasingly promoted and even adopted worldwide because it is considered environmentally sensitive.

We will now focus on two good practices in the use of clean energy.

IV. GOOD PRACTICES IN THE USE OF CLEAN ENERGY

Two specific cases will be described below by way of example. This is a Togolese case (A), and a French case (B).

A. Togolese case: Project "Electrification of Agome Sevah using solar energy" by the "Dékamilé" Association (2013-2015)[76]

At the initiative of the Dékamilé Association, the village of Agome-Seva has benefited from a solar electrification project to meet household needs and improve night lighting to secure and improve socio-economic activities. With funding from the Global Environment Facility's Microfinance Programme (GEF/MFP) and assistance from other partners, the project demonstrated the feasibility of electrifying a poor village and establishing management for the sustainability of the facilities and services created.[77]

1. Results of the project

The results of the project will be analysed on ecological (a), social (b) and economic (c) levels.

a. On the ecological level

The project consisted of introducing a solar energy production system in households to provide lighting and electricity for small electrical equipment. Sustainable energy is thus made available to a community, partially replacing fossil fuels and offering other development opportunities without carbon footprint.

b. On the social level

A group of women benefited from specific training delivered by an Indian equipment supplier, in partnership with a cooperation structure (from the same country). The project was largely successful. 70 solar panels are now needed to equip 100% of the population of Agome-Sevah (153 beneficiary households).
The Association was able to establish the necessary partnerships with the support of the PMF/FEM to carry out this pioneering electrification. It has benefited from training offered in India (Barefoot College), and vulnerable women have become, each in turn, trainers for other communities.

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[75] Republicoftogo.com, 03/07/2020, https://www.republicoftogo.com/Toutes-les-rubriques/Developpement/Mix-energetique-le-Togo-recompense, consulted on 10/10/2020
[76] National coordination of the Global Environment Facility's Microfinance Programme (PMF/FEM), 2016
[77] UNDP Togo, https://www.tg.undp.org/content/togo/fr/home/stories/togo--l_electrification-dun-village-au-panneau-solaire-se-fait-p.html, consulted on 10/10/2020

Engineers trained in the project,

electrifying a household with solar energy

c. On the economic level

A model for the sustainable management of solar equipment was initiated by the Association within the framework of the project. Households are offered a turnkey solar kit enabling the electrification of an average household for a competitive price: 7500 FCFA (13.63 USD) for the installation, then 1000 FCFA (1.81 USD) per month as a contribution to maintenance and servicing costs. Apart from the initial grant that made it possible to launch the project and order the equipment, the project is already financially autonomous [78].

2. Lessons learned and project success factors

The project benefited from a partnership opportunity that it was able to materialise thanks to the support of the Global Environment Facility's Microfinance Programme. Indeed, in addition to a competitive wholesale price for the purchase of electrification equipment, the project has enabled the training of local women. The "training of trainers" approach is proving to be relevant: today, the Association's local centre has become a training centre to benefit other women and communities.

3. Conditions for efficient upscaling

On the basis of the links established between this Association and the Indian partners, it is interesting to disseminate training and electrification opportunities to communities still deprived of access to electricity. The training centre would then play the role of facilitator and focal point of this development dynamic.
This type of project could benefit from additional contributions under the carbon finance and offset mechanisms. The support of an office with the relevant expertise to assess funding opportunities should be included in the design of the projects.

Now, let's look at a different, equally interesting case, that of France.

[78] Idem

B. Cas français : French case: Sud Concept and Etudes et Chantiers Corsica [79]

Table 2 : Ucciani power plant equipped with multicrystalline silicon photovoltaic panels

Title of the good practice Electricity production	**Contact :** Name : Kyrnesole SA Address : Piana Sottana, 20218 Castifao (siège social) Tel : 33(0)495 47 86 16 Courriel : Web:www.kyrnesole.com, http://www.societe.com/societe/kyrnesole509629911.html
Institution and / or individual The project was initiated by Bernard Grimaldi, founder of the Corsican company Kyrnesole, and entrusted to the joint venture in June 2011 (Schott Solar+Canopy). It is a 7.5 hectare photovoltaic power plant located in Ucciani, in the centre of Corsica..	
Summary of the practice The Ucciani plant is equipped with multicrystalline silicon photovoltaic panels (Schott Perform poly 220 model), selected for their longevity and flexibility. The site, connected to the national electricity grid, will produce around 2.86 GWh per year, and will supply around 1,000 Corsican households with renewable energy - with an average consumption of 2,860 kWh per household.	
Context of its implementation The geographical location of the commune of Ucciani, which benefits from a high level of sunshine, has made it possible to implement an original project in the region - the construction of a photovoltaic power plant. "We are proud of this project, which contributes to the economic development of the commune and to Corsica's energy independence" said Henri Franceschi, mayor of Ucciani.	**Target audience** Local communities

[79] SUD CONCEPT, Ajaccio et Etudes et chantiers corsica, Sorio, « The French case by Sud Concept and Etudes and Chantiers Corsica » ISEI S.A.S, *Guide to good practices in the different territories of the partners: - in wood eco-construction. - in renewable energies,* 2020, pp 23-24, available at http://sudconcept.eu/wp-content/uploads/2018/12/2WEB_Guide-des-bonnes-pratiques_final.pdf , consulted on 10/09/2020

Objective of the approach *The downward trend in the cost of solar energy is making it more competitive every day, while traditional energies are seeing their real costs rise inexorably. Photovoltaic energy is a significant means for municipalities seeking energy independence.*	**Results** Tout en restant utilisable pour le pâturage, the communal land on which the facility was built will bring a rent of 30,000 euros per year to the community for 20 years. In addition, the civil engineering works were carried out by a company from the village, thus stimulating the local economy.
Perspective of use and dissemination Perspective of use and dissemination Satisfied with this first achievement, the municipality has given its approval for the second part of the 1.4 MWp project, subject to a 2**012 call for tenders.**	
Environmental impact An exceptional site! This ground-mounted solar power plant is a concentrate of good ecological practices. It has adapted to its environment and not the other way round. It has been gently integrated while respecting the whims of the mountains. The attachment piles were driven into the ground without any trace of concrete. The land also retains all its grazing potential in a spirit of cohabitation between energy production and pastoralism. "The process is therefore completely reversible. This site can be returned to its original state at the end of the lease without any problem," says Florent Wolf, President and Commercial Director of Canopy, one of the project's financiers. The new photovoltaic technology will provide Corsica with new energy autonomy and reduce its oil consumption as well as the resulting pollution.	

Motivation of choice: a typical example of good ecological practice through the creation of a new mode of energy autonomy (1,000 households) that respects the environment.

CONCLUSION

Climate change is a contemporary phenomenon, and there is unanimous support for it. Both in the North and in the South, the ravages of climate change have made people agree that it is a fearsome phenomenon: there are floods, heat waves, in short, climatic extremes everywhere. Crop losses, landslides, landslides, destruction of homes and other property, and loss of life are legion. In fact, climate change conjures up a litany of damage, some more dismal than others, including greenhouse gas emissions from fossil fuels.

Having understood the cause and effect link between fossil fuels, climate change and the consequences of the latter, struggles of various forms, including advocacy actions to claim the right of vigilance of multinationals, the latter's liability for fault have been initiated. Some peoples have launched resistance against the promoters of fossil fuels, whose sole objective is to gain by all means, including to the detriment of the former. The latter are said to have committed the fatal mistake of living on land whose subsoil is full of fossil natural resources.

In the course of their struggles (at the risk of their lives) against the oil, gas and coal companies, these peoples have constantly demanded a halt to the exploitation of the incriminated deposits, reparations, and the restoration of their rights.
These communities have often been supported in their struggles by ecological organisations, opinion leaders, researchers and local authorities, who have proposed alternatives to fossil fuels, known as renewable, clean energies.
Convinced of the need for reform in the energy sector in order not only to diversify their sources of supply but above all to meet their commitments within the framework of nationally determined contributions (Paris Agreement), most States are developing clean energy projects in which communities at the grassroots level participate and benefit from their empowerment.

Over the years, knowledge is consolidating to the extent that case studies on the subject are available for scaling up. Eventually, the page of fossil fuels must be turned, willingly or unwillingly, as they are non-renewable and dirty. The crises that humanity is going through are guiding, and will continue to guide, human choices. Doesn't the Covid-19 health crisis invite humanity to reinvent itself for a sustainable world?

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