

Oil Drilling in Nepal

(Scenario and consequences)

Power Shift Nepal

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ABSTRACT:

Nepal, rich in minerals, might sometimes be at a disadvantage if not utilized properly. Evidence of the presence of petroleum has been found in the Dailekh district and China has made an alliance with Nepal for the extraction. So, China has been playing a vital role in the process. The project has just mentioned economic development but ignoring the environmental consequences. Oil drilling degrades the quality of the environment (soil, water, air etc.), at the same time it impacts human health as well as destruction of the habitat of animals. As Nepal is located on the fault lines that connect the Indian and Eurasian plates, making it earthquake prone. It can result in the worst scenario of destruction due to oil drilling. All these consequences have to be faced by Nepal. So, this paper will discuss the working stage as well as the consequences which Nepal will face in the near future. The study has been conducted with the secondary data, reviewing the documents from the online portals.



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1. INTRODUCTION:

Climate Change has been an emerging topic in Nepal because it is very evident about the consequences that we are facing. One of the main reasons for climate change is Greenhouse gasses. Every activity we perform contributes to the production of greenhouse gasses whether it be on a small scale like households or in large scale like industries and transportation. The main source of the greenhouse gas production is burning of fossil fuel. The largest driver of overall GHG emissions are CO₂ emissions from fuel combustion. In Nepal, energy related CO₂ emissions from the transport sector are the largest contributor at 50%, followed by the industrial and building sectors with 27% and 15% respectively. (Climate transparency, 2021, 5)

Nepal has a history of small-scale mining. The country has been rich in minerals for 100s of years. Since ages, we have been extracting the resources from the earth. Food sources are the main resource we have been consuming since ages. Later, on forest, for habitat as well as for firewood too. Still in the village area firewood is the source of energy for cooking purposes. All these practices have been transferred from generation to generation. Small smelting places can still be found in places but no such big projects of exploration were conducted.

In May 2016, a joint technical team from Nepal and China conducted a feasibility study on oil and gas exploration at 10 different locations including Dailekh, Nepalgunj, Chitwan, Mustang, Morang, Chatara and the Chure range in Palpa. (The Kathmandu Post, 2019)

1.1. BACKGROUND:

Nepal is a landlocked nation with dimensions of 800 km in length and 150–230 km in width. It is located in central Asia between India to the south and China to the north. Nepal has an abundance of natural resources such as minerals, water, forests, medicinal herbs, and a wide range of agricultural products. Exploitation and proper use of such valuable resources, particularly mineral resources, is critical for the country's economic development. Lots of the research has been done and evidence of minerals especially has been found in Nepal. Minerals are a country's nonrenewable natural resources and hidden treasure. People have been mining and

using them in various forms for various purposes since prehistoric times. One of the processes of extraction of minerals from the earth is Oil Drilling. It is the process which involves drilling the earth surface to the layer which contains oil and pumping them out. A systematic petroleum investigation in Nepal began in 1979 with the evidence of oil and gas seeps in the north of Main Boundary Thrust (MBT) throughout the country. The Government of Nepal has established a separate unit 'Petroleum Exploration Promotion Project (PEPP)' IJ 1982 to promote and monitor the exploration works in the country.

As Nepal has the vast diversity in the formation of landscape and complex geographical features, this has resulted in the richness in the mineral content. Iron, copper, zinc, cobalt, silver, gold, etc. have been mining on a small scale since ages. Nowadays it has been highlighted because of the market value. All this mining has had some direct impacts on the environment. So the necessary precautions have to be followed during the process.

Oil drilling; mining of the petroleum; is one of the biggest projects of the extraction of minerals. Nepal also has tested some places for mining collaborating with different international agencies. If we focus on the economic development of the country, some positive side can be seen but the adverse effect that it causes is countless. The process of drilling itself has a negative impact and the fossil fuel which we extract also has its own hazardous effect. Since fossil fuel is the product after the compression of dead plants and animals in presence of heat and pressure. It lies below 100s km down from the earth surface.

The following figure will show the layer where the oil is found on the earth surface.

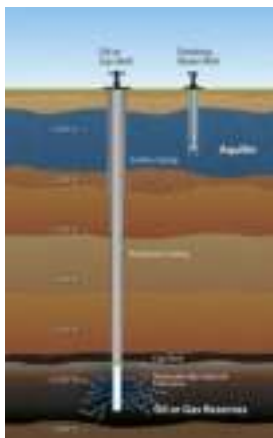


Fig 1: showing the layer which content oil in earth surface

The survey has been conducted in different places of Nepal to find gas and oil reserves. A seismic survey which was conducted in the Dailekh district for the exploration of petroleum products revealed that the district has underground gas and petrol reserves. (Online khabar, 2021)

Oil drilling is the main source of fossil fuel. It can be done in numerous ways and each of the ways has its own consequences. Some of the common methods used in the gas and oil exploitation are: percussion drilling, rotary drilling, dual-wall reverse-circulation drilling, electro drilling, directional drilling etc. (Funnell, n.d., #) All these methods have to deal with making a hole in the earth surface passing enough pressure.

Fracking: Fracking, also known as hydraulic fracturing, is a method for extracting gas and oil from shale rock. To extract the gas inside a layer of rock, it requires drilling into the earth and applying high pressure to a solution of water, sand, and chemicals. (BBC news, 2022, #)

Concerns about fracking's impact on the environment and human health have grown. The process generates large amounts of wastewater, emits greenhouse gasses like methane, emits toxic air pollutants, and generates noise. According to studies, these gas and oil operations can result in the loss of animal and plant habitats, the decline of species, migratory disruptions, and land degradation. They have also been linked to risks to human health. Several studies have found links between living near these operations and an increased risk of miscarriage, cancer, hospitalizations, and asthma. (Deziel, 2022)

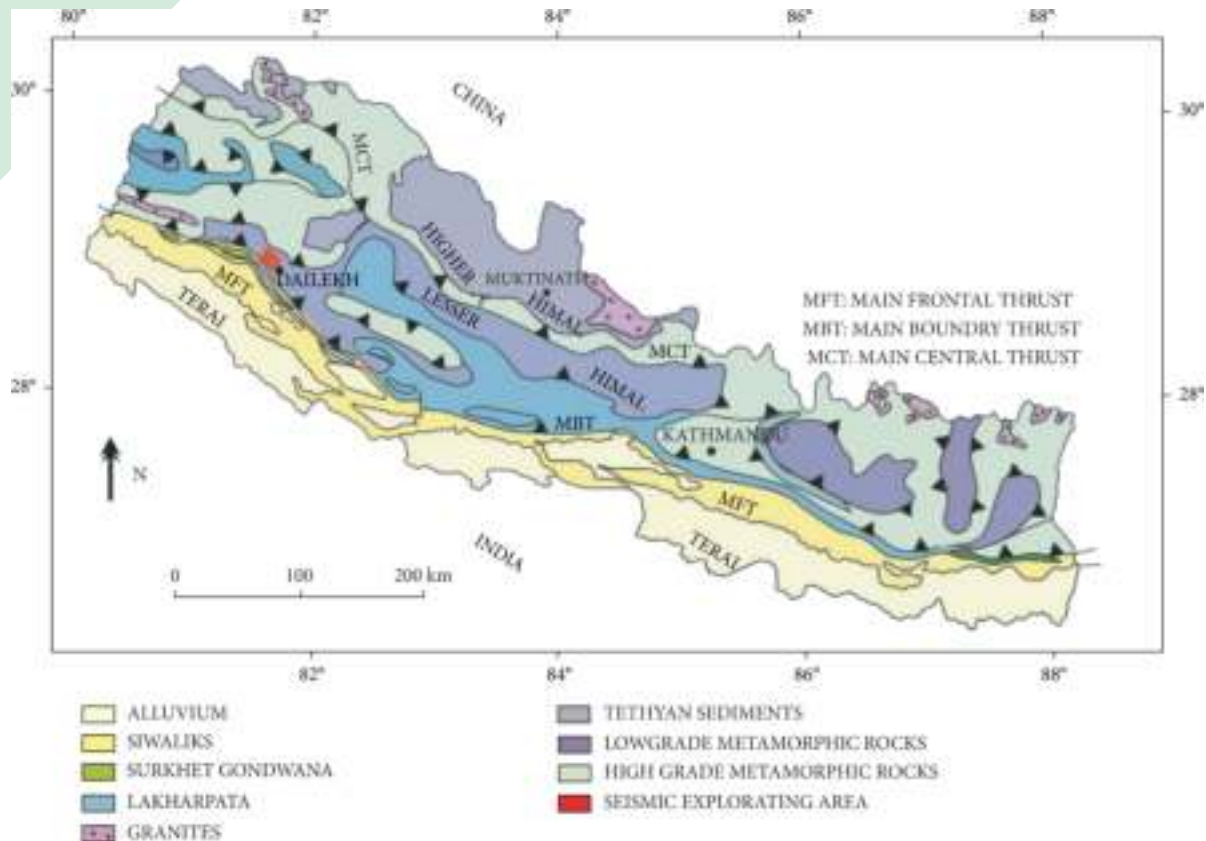
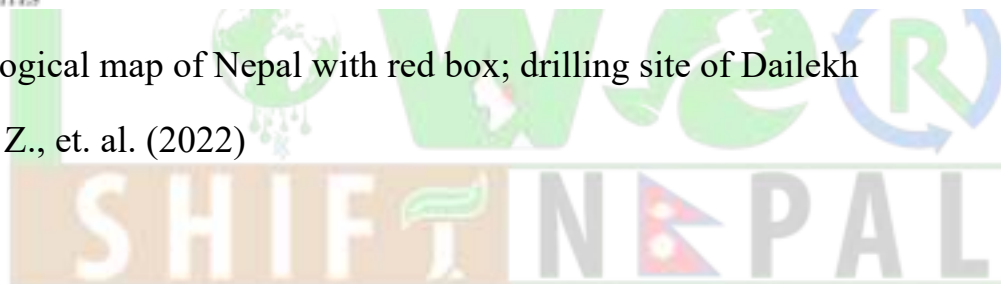


Fig 2: Geological map of Nepal with red box; drilling site of Dailekh

Source: Li, Z., et. al. (2022)



1.2. STATEMENT OF PROBLEM:

Any work we initiate has its own carbon footprint. The main source of the increased carbon footprint is the usage of fossil fuel. The fossil fuel itself has impacted the environment. But the process that deals with the extraction of fossil fuel has also its own impact on the environment.

Since ages Nepal has been extracting oil and its negative impact will gradually be seen with the degradation of quality of the environment. The geography like Nepal's

oil drilling site will result in more negative issues comparatively than other oil drilling sites.

1.3. PURPOSE OF STUDY:

The main purpose of the study is to know about the oil drilling scenario in Nepal. The oil drilling project in Dailekh, Nepal is one of the biggest projects of Nepal. Since the agreement has already been signed and the project has already started, we wanted to know the details of it and possible consequences that can be faced later on because of the oil drilling.

Through this we can make the public as well as respective authorities aware about the oil drilling, as not a good option and then promote energy transitioning.



2. METHODOLOGY:

This paper is primarily based on secondary data sources. The majority of the information was gathered from reviews of existing literature on the current status and utilization of minerals resources in Nepal. Several newspaper articles were also reviewed during the process to collect information about the current scenario. For data generation, government policies and reports were reviewed. The information gathered from various sources was analyzed using both analytical and descriptive methods.



3. FINDINGS AND DISCUSSION:

Earlier a seismic survey was carried out covering an area of 400 square kilometers in Dailekh based on areas including Navisthan, Srasthan and Paduka. After getting positive results in the Magneto telluric Geological Survey and Geochemical Sample Survey of the first phase of petroleum exploration, it has been decided to proceed with the next phase of the survey. In the final phase of the survey, underground digging will be done for four kilometers. The exploration of petroleum products will be completed based on some areas of Dailekh's Bhairavi Municipality, Dullu Municipality, Dungeshwar Municipality, Chamunda Bindrasaini Municipality, Mahbu Municipality and Narayan Municipality. (Acharya, 2022)

The necessary test has been done and the Nepal government along with China is planning to extract oil from there if everything goes as per the plan. All the machines and equipment were imported in 2019 and the work of digging was started. According to the news media the department stated that it would take approximately 3 years to explore. After the agreement, because of the corona outbreak the exploration was paused as the team could not visit Nepal. After that the team started working on the report on the volume of petroleum existing there. According to the department almost 10 sites were tested where 4 sites had the possibility of presence of petroleum. Until then The Department of Mines and Geology has a record that more than USD 7.2 million was spent on exploration then. (Online khabar, 2021)



Fig 2: Oil drilling site of Dailekh

source: Republica; Govinda KC

As the agreement has been signed and the work is going on continuously to find the oil reserve area and export it, there should have been analytical studies about the pros and cons of the oil drilling site. If taking it as the only way to boost the economy of the country then it can probably be the right decision but the negative impact it causes will be for always. Nepal is not very rich in manpower and economy so exploration is possible with only the help of other countries. That results in the growth of their economy more than ours. At the same time not only economic loss but also the environmental consequences have to be faced by Nepal only. Already lots of attempts have been performed where pits have been made and degraded the quality of the soil and land. Economically stable countries where oil drilling projects are also happening are facing the climate consequences too. Nepal is already listed as a polluted country. The extraction of fossil fuel will make it worse. Oil drilling site itself gets degraded. For the process giant machines are used to drill. Those machines rupture the land and make it worse during the Earthquake. Oil spills from the oil drilling process cause soil pollution. The runoff from those soils causes water pollution. As shown above (fig 1) the drilling process goes deeper than the water level resulting in water pollution and at the same time shortage of drinkable water too. These factors directly or indirectly cause the decrement in the production. Another very serious issue from the oil drilling is health impacts to the nearby villages. The noise as well as the air pollution from these sources has a direct impact on living beings. As per the study, even the animals living nearby have been diagnosed with various skin diseases and in the case of human beings too.

Dailekh is an ecologically diverse area in Western Nepal. The area has four different types of vegetation. Agriculture supports the majority of the population (roughly 98%). Petroleum extraction, particularly through unconventional methods (such as fracking), will harm the diverse ecosystem and the livelihoods of the majority of people who rely on it. Fracking has also been shown to cause earthquakes. Nepal is located on the fault lines that connect the Indian and Eurasian plates, making it vulnerable to earthquakes, as evidenced by the 2015 major earthquake that killed over 8000 people. Landslides will almost certainly follow earthquakes (which the area is already vulnerable to). Oil drilling will also pollute water sources, harming the people in the area as well as the areas where the water is used. (Shale must fall, 2020).

3.1. Cases related to fracking:

Colorado, a western state of the USA with a dramatic landscape of mountains, forests and canyons, is the seventh largest gas producing state and has been facing Wildfires and floods linked to global warming, and the decline in snowpack on the mountains is fueling drought and water shortages throughout the west. It also has some of the country's worst air quality, with oil and gas operations accounting for 30-40% of locally produced ozone. (Lakhani & Milman, 2022)

In Wyoming, the EPA determined that fracking was responsible for groundwater contamination in central Wyoming. Residents had complained that their well water had turned brown after nearby gas wells were fracking. In 2008, water well samples revealed hydrocarbons and traces of contaminants associated with fracking. The EPA advised residents not to drink the water and to ventilate their homes after bathing because methane in the water could cause an explosion. The EPA later determined that pollution from abandoned oil and gas waste pits was responsible for some groundwater pollution, but contamination in two deep test wells had to be caused by fracking. (“Evidence of Fracking Risks Grow in Texas and Other States,” n.d.)

Sichuan, China is naturally prone to earthquakes, including a major one in 2008 that killed nearly 70,000 people, but the villagers of Gaoshan believe the cause of these tremors was man-made. A series of three earthquakes was experienced after the fracking operation started. (Myers, 2019)

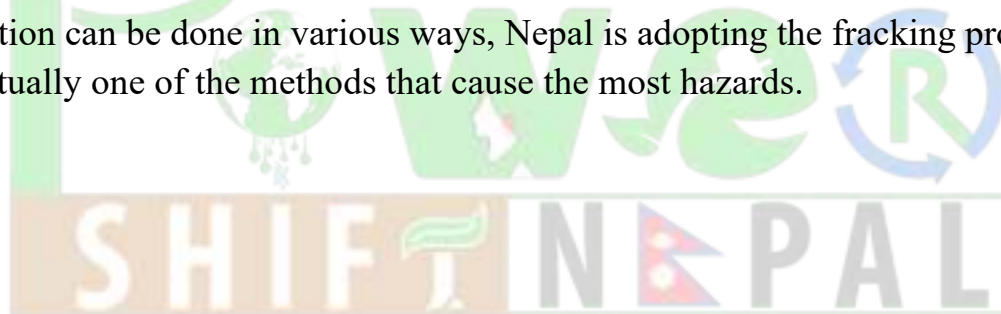
CONCLUSION:

Oil drilling may help in economic development but if the comparative analysis is done about merits and demerits, oil drilling always falls in the demerit side.

All of the above mentioned impacts are seen from the process of oil drilling itself. While the product from it; fossil fuel has its own hazardous impact on the environment. One of the main sources of greenhouse gas is burning of fossil fuel. The greenhouse gasses trap the heats in the earth which has raised the controversial topic Climate Change. All these factors are interrelated.

Oil drilling has become the foremost topic that has to be done with precaution otherwise all the environment components will be destroyed sooner or later. Nepal also is one of the earthquake prone areas which may also experience the same case as china. Because of the presence of all forms of geographical landscape the same case as the USA, Nepal can also experience water contamination and air quality degradation.

Oil exploration can be done in various ways, Nepal is adopting the fracking process which is actually one of the methods that cause the most hazards.



RECOMMENDATIONS:

Studying and knowing about all the impacts that are caused due to oil drilling, especially fracking, certain measures can be implemented for the betterment of the quality of the environment.

- Renewable energy and its benefits can be promoted
- EIA has to be conducted before the operation starts in oil drilling
- Government must be prepared about the consequences that can be faced and find out the minimizing measures.
- Local people have to be aware about the drilling site and proper displacement of the people is must.
- Oil drilling site should not be projected near the densely populated area
- Every personnel has to have a concept about the importance of the ecosystem and aspect of the environment.
- Increase awareness about the energy transitioning and the sustainable use of resources.

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