Chapter 17

NATURAL RESOURCES: Distribution, Governance and Politics

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Introduction

Human existence and survival is primarily important for the world to have meaning and for its sustained and continuous transformation. From both evolutionary and biblical accounts, the existence of most of the world known natural resources predated human existence. Man arrived on earth to meet certain natural resources on ground. Thus, since the existence of the first man, nature has been explored and exploited to tap the various resources on earth for human use. Modern society also depends on the availability of mineral resources (Botkin & Keller, 2000, p.595).

As a matter of fact, everything which occurs or exists naturally that are for human use on earth are called natural resources. According to Littell (2008, p.44), 'Minerals are formed by natural processes'.

Getis et al. (2011, p.119) averred that, 'a resource is a naturally occurring, exploitable materials that a society perceives to be useful to its economic and material well-being'. Similarly, 'A natural resource is any energy source, organism, or substance found in nature that people use' (Littell, 2008). From human experience, it has become clear that some natural resources are exhaustible while others are renewable. Some examples of exhaustible resources include fossil fuels, gold, forest, diamond, etc. The examples of inexhaustible natural resources include sunlight, water, air, etc. Most of the resources are for human use and consumption. In other words, the resources provide one benefit or the other to mankind. Although some are useable in their original or natural form, but many have to be processed or transformed before use. Some of the resources around us include, but not limited to air which provides wind energy and sustain human existence; water which has both domestic and industrial values, especially for drinking and production of hydroelectric energy; coal which is a source of power, particularly when used to fire turbine to generate electricity; and forests which provide paper, wood and various medicines. Same for sunlight which has numerous utility values. Domestically, it serves as drier for food and clothes, photosynthesis for plants and a source of solar energy. Fossil fuel is the source of petroleum from which other numerous products are derived. There are other numerous resources or minerals found across the globe, a few of which will be highlighted later in this chapter.

Availability of natural resources in any country contributes to its wealth base, especially if it is in commercial quantity. This will translate to socio-economic development, generate and sustain growth. 'Minerals are so important that the standard of living increases with the availability of minerals in useful forms. The availability of minerals resources is one measure of the wealth of a society' (Botkin & Keller, 2000, p.596). However, this may only happen where the revenue from the resources is properly managed and transparently used for the development of the state. In reality, most states dependent on natural resources have often mismanaged the revenue from the resources. A properly managed resources utilization will provide vital

supplementary income as well as ensure food and economic security in times of crisis such as drought, thereby reducing poverty (Steiner et al., 2000; OECD 2009; Lafaye, 2012; Jack et al., 2016). Conversely, the lack of transparency and misuse of resources has resulted in low quality of life. Thus, the occurrence of natural resources has become a source of intra or inter-state conflict. Competition over ownership, the struggle over control and dispute over the sharing of the proceeds of resources have often triggered intra and inter-tribal/group conflict and acrimony, especially in the developing countries. Sudan, Liberia and currently South Sudan are a few examples in this regard. Indeed, some writers referred to some of these resources as a curse rather than a blessing. To such writers, resources have been a source of conflicts, civil wars, mass corruption and deaths in many countries. The struggle to capture or control the natural resources seems to assumed prominence, because most of the states, particularly the resource dependent developing states, are largely dependent on the income generated from the natural resources to finance their annual budget and execute developmental programmes and plans. Poor administration of resources therefore feeds into the conflict that most of such states go through.

Indeed, as earlier noted, humans obtain and produce her material needs from available natural resources within our environments (ASTM, 2008). Advancement in technology, needs economic, and the utility value have in turn shaped the global demand of many resources. Thus, various resources enjoy variations in their level of patronage and the value placed on them in the local and international markets. Every artificial product is made from the natural resources. Many emerging economies are major importers of natural resources (OECD, 2009). Consequently, the increase in demand of some natural resources makes improved resource management even more urgent (OECD, 2009). Thus, natural resources such as petroleum and uranium have gained strategic importance in contemporary international system and politics.

Since, different places are endowed with different or similar natural resources the countries that do not have a certain natural resource but consume same will either source it from other country or make use

of an alternative where it is available. This in itself has some economic implication, as the importing are state faced with the challenge of capital flight while the exporting state accumulate wealth. The effect of resource wealth on development outcome is however, often mixed. The reality of the global situation suggests that the resource-dependent countries with low-quality or weak institutions and poor resource utilisation are vulnerable to resource curse, while resource-dependent countries with high-quality and strong institutions for effective resource governance and utilisation are not (Wiens, 2014).

Considering that most natural resources are deplete-able, sustainable usage and management of natural resources has become a global concern. Even though modern technology has helped in discovering alternatives, the need for circumspection in managing resource remains very important.

In view of the foregoing, we shall examine the types of natural resources, the distribution of some selected natural resources, governance and politics in this chapter.

Types of Natural Resources

Natural resources are categorized as Renewable and Non-renewable resources or as biotic and abiotic resources. Renewable resources are the natural resources that are consistently available, not-deplete-able and replaces itself after utilization. Getis et al. (2011) noted that renewable resources are material that are replaced or replenished by natural processes. A distinction between those resources that are perpetual and those that are renewable only if carefully managed could further be made. Thus, the perpetual resources are derived from sources that are virtually inexhaustible, namely, the wind, waves, tides, and geothermal energy. However, potentially renewable resources are renewable only, if left to nature but can be destroyed if used carelessly. Some of such resources are groundwater, soil, plants, and animals. These resources can be depleted if the rate of exploitation exceeds that

of regeneration. The renewable raw materials that come from living things such as animals and trees are therefore, organic renewable resources while inorganic renewable resources come from non-living things such as sun, water and wind.

The Non-renewable resources are the natural resources that cannot be substituted or recovered once they have been used or destroyed. Getis et al. (2011) noted that non-renewable resources exist in finite amounts or are generated in nature so slowly that in all practical purposes the supply is finite. Their formation periods may take thousands of years. The resources in this category include fossil fuels and minerals. The non-renewable materials like coal, crude oil, natural gas, oil shales, and tar sands are fossil fuels. All these resources are regularly exploited for economic purposes either for local or international trade. Consequently, they shape international politics because of their importance. In addition, nuclear fuels comprising uranium and thorium and a variety of non-fuel minerals, which are both metallic and non-metallic, are non-renewable. The fossil fuels are usually the remains of living things and as such referred to as organic non-renewable resources, while those that come from non-living things such as rocks and soil are non-renewable in organic resources.

The biotic natural resources are resources that originate from the ecosphere. Specifically, these resources are derived from organic and living materials. These include forests, fossil fuels such as petroleum, oil, and coal. Abiotic natural resources are resources that originate from non-organic and non-living materials. These include but not limited to water, land, air and heavy metals like iron, copper, silver, gold. Most of the infrastructural development and improvement in standard of living in nations are attributable to the exploitation and exploration of their available renewable and non-renewable resources (Steinbach & Wellmer, 2010; Coria and Sterner, 2011; Speirs et al., 2015). The problem is how to know when the exploitation of these resources occur at rates and with technologies that are sustainable, otherwise serious problems may arise in the future. This long-term management planning to avoid irreversible depletion of renewable resources is required for sustainable development.

Distribution of Some Selected Natural Resources

Resource distribution is the geographic occurrence or spatial arrangement of resources on earth. All over the world, different places are endowed with different or similar natural resources. In some countries or regions, many resources are found in large quantities, while in others resources are relatively few ~~and~~ in quantities (Getis et al., 2011). Interestingly, geographically, the factors that influence human settlement include but not limited to availability of water, soil, vegetation, climate, and landscape. In spite of the ability of man to adapt to his environment, availability of natural resources serve as incentives for the development of human settlement. The Trail of Tears, Westward Movement, and the Gold Rush are examples of unequal resource distribution that triggered migration.

As earlier noted, while natural resources are found across the various states of the world, the extent of their occurrence vary from place to place. Nevertheless, some resources such as sunlight (solar), air, water, and wind are common natural resources all over the world. But resources like petroleum is found only in oil producing countries, and as such play significant roles in international politics because ~~of~~ it is a source of global energy.

As at 2011, fossil fuels accounted for about 82 per cent of the global primary energy use but expected to decline to only about 78 per cent by 2040 (Energy Information Administration, 2011). Fossil fuels, namely, coal, crude oil, natural gas, oil shales, and tar sands will continue to be important in both local and international markets and in political arena. Based on these, we shall briefly discuss a few of these natural resources focusing on their distribution.

A. Selected Energy Resources

(i) Petroleum, or Crude Oil

Petroleum or crude oil has been the world's largest source of energy for over 60 years, with Russia, Saudi Arabia and America as the top three producers (Rempel, 2006; International Energy Statistics, 2016; Energy Information Administration, 2017). The trio account for about 38 per cent of the world's oil production (International Energy Statistics, 2016). In Africa, the three-leading oil producing nations (Nigeria, Angola and Algeria) are ranked as 13th, 14th, and 18th positions respectively in the world (International Energy Statistics, 2016). On a per-capita basis, Kuwait is at the top with a production of over 50 tonnes of oil per-person per annum. This is about twenty times higher than the annual per-capita oil consumption in America, and about one hundred times higher than annual per-capita oil consumption in China.

(ii) Coal

Globally, coal production and consumption is dominated by China. China produces and consumes nearly 38 per cent of the global output (World Energy Council, 2013; World Coal Institute, 2005; Monda, 2018). The United States of America is the second largest producer of coal in the world (Monda, 2018), accounting for 17 per cent of global production (World Steel Association, 2014; National Minerals Information Center, 2017). India is the third largest coal-producing country in the world with a production output of 7.2 per cent and South Africa ranks 5th. On per-capita basis, China produces less coal than America while Australia produces almost eight times more coal per-person annually than China, and about three times more than any other country in the world (World Energy Council, 2013; World Coal Institute, 2005; Monda, 2018).

(iii) Natural Gas

America and Russia are the two world largest producers of natural

gas, with a combined capacity of 39 per cent of the global annual output (Central Intelligence Agency, 2017; Statistical Review of World Energy, 2013; International Energy Agency, 2014; OPEC 2014; Wilson, 2014). The three-leading natural gas producing nations in Africa; Algeria, Egypt and Nigeria are ranked 9th, 17th, and 19th, respectively in global production. Qatar with 0.03 per cent of the world's population is the 4th world largest producer of natural gas and accounts for 5.4 per cent of the global natural gas production output (International Energy Agency, 2014; OPEC, 2014; Wilson, 2014). On per capital basis, Qatar is the world's largest producer of natural gas. Next is Norway with five times more natural gas than any other developed country. By 2040, natural gas consumption is expected to increase by about 13.4 per cent and coal consumption by 5.6 per cent (Central Intelligence Agency, 2017; Statistical Review of World Energy, 2013; International Energy Agency, 2014; OPEC, 2014; Wilson, 2014). Other producers include Iran, Qatar, Canada, Norway, Turkmenistan, Indonesia, Netherlands, Malaysia Australia, Uzbekistan, United Arab Emirate, Mexico, Thailand, Trinidad and Tobago Pakistan UK, Argentina, Omar, Nigeria, Benin, Cape Verde, Cambodia, Central African Republic, Brazil, Chad, etc (CIA World Factbook, 2017).

B. Earth's Water Resources

The distribution of water globally is extremely uneven. Of the total water on earth surface, only 3 per cent is fresh while the remaining 97 per cent is sea and ocean waters (Shiklomanov, 1993; Meissner, 2009; Meissner & Mampane, 2009). Almost 69 per cent of the world freshwater is found in glaciers and icecaps, about 30 per cent is groundwater while only about 0.3 per cent is found in the lakes, rivers, and swamps (Shiklomanov, 1993). Of the 1 per cent of the Earth's surface water that is usable by humans 99 per cent ~~of this~~ is groundwater (Figure 1).

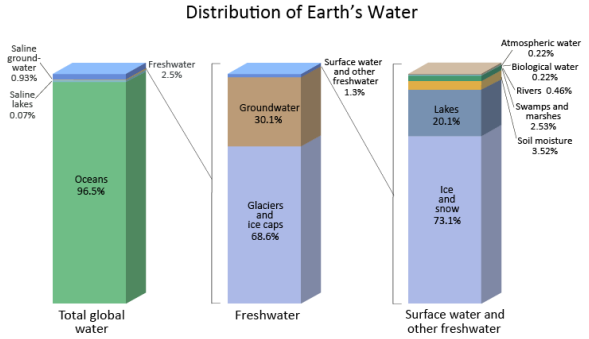

Figure 1: Earth's Water Distribution.

Source: Shiklomanov (1993).

At a country level, there is an extreme variability in Total Renewable Water Resources (TRWR) ranging from a minimum of 10 m^3 per Kuwait inhabitant, for instance, to over 100,000 m^3 per inhabitants of Iceland, Gabon, Suriname, Canada etc (FAO, 2003). In terms of water resources per inhabitant, Bahrain, Jordan, Kuwait, Libya, Arab Jamahirya, Maldives, Malta, Qatar, Saudi Arabia, United Arab Emirates and Yemen are regarded as the world's ten poorest countries while the nine countries of Brazil, Russia, Canada, Indonesia, China, Colombia, USA, Peru, and India are the worlds water giants, accounting for 60 per cent of the world's natural freshwater (FAO, 2003). The global regional distribution indicates that Northern and Southern America account for 43.5 per cent, Southern and Eastern Asia 26.8 per cent, Eastern Europe 10.2 per cent, Africa about 9 per cent while Western & Central Europe, North East, Central Asia, Oceania & Pacific, and Central America & Caribbean account for the remaining 10.5 per cent of World water resources.

According to the FAO (2003), some 30 countries depend on other countries for well over 50 percent of their renewable water resources requirement. These countries are - Argentina, Azerbaijan, Bahrain, Bangladesh, Benin, Bolivia, Botswana, Cambodia, Chad,

Congo, Djibouti, Egypt, Eritrea, Gambia, Iraq, Israel, Kuwait, Latvia, Mauritania, Mozambique, Namibia, Netherlands, Niger, Pakistan, Paraguay, Portugal, Republic of Moldova, Romania, Senegal, Somalia, Sudan, Syrian Arab Republic, Turkmenistan, Ukraine, Uruguay, Uzbekistan, Viet Nam and Yugoslavia.

C. Other Selected Mineral Resources

(i) Iron Ore

China is the leading iron ore producing country worldwide (Phillips, 1977; Statistical Review of World Energy, 2013; World Mineral Production, 2013; World Steel Association, 2014; Meinert et al., 2016; Comtois & Slack, 2016; USGS, 2018; Schulz et al., 2017). Its production rose from 6.5 per cent in 1975 to 24.3 per cent in 2000 and to 30.8 per cent in 2007. Further increase has been recorded in recent years. Brazil is the world second largest producer of iron ore with total contribution of 17.8 per cent to global production. The Brazilian iron ore reserves in Itabiria is noted as the richest iron ore reserves in the world with an estimation of 35,000 million metric tons. Australia is ranked 3rd in global iron ore production with 16.0 per cent, while India occupies the 4th position. South Africa, the leading producer of Iron ore in Africa is ranked 6th in the world after Russia that accounts for about 7 per cent of the world iron ore production. Nigeria has iron ore deposit in Ajaokuta but it has remained untapped.

(ii) Copper

Almost 90 per cent of copper reserves in the world, are found in South Africa, Chile, Western USA, Kazakhstan, and Canada (Nakajima et al., 2017; Lusty & Hannis, 2009; USGS, 2018). Chile is the largest producer of copper in the world, with a production output of more than 30 per cent. Peru produces 7.7 per cent of global output. The USA ranked 3rd produces 7.6 per cent. Other countries like China, Indonesia and Canada produce just about 6.4 per cent, 4.1 per cent, and 3.7 per

cent, respectively (Nakajima et al., 2017; Lusty & Hannis, 2009; USGS, 2018).

(iii) Gold

Until 2006, South Africa was the leading gold producer in the world. Recently China, Russia, Canada, the United States, Peru and Australia have recorded higher outputs than South Africa (Leger & Nicol, 1992; Zhou et al., 2002; Hartnady, 2009; USGS, 2018). As at 2016, China was rated the largest producer of Gold in the world and accounted for about 14 per cent of total global production (Zhou et al., 2002; Hartnady, 2009; USGS, 2018). Australia, Russia and USA are ranked 2nd, 3rd, and 4th with 9, 7.9 and 7.3 per cent of the total global production, respectively. South Africa and Ghana remained the leading producers in Africa, even when they are ranked 7th and 11th worldwide.

(iv) Silver

Mexico, Peru, and China are the leading producers of Silver and account for 20.7 per cent, 15.2 per cent and 13.3 per cent, respectively of the total world's silver production (USGS, 2018). Australia, Poland, Russia, Bolivia, and USA put together account for 30 per cent, while the rest of the world produce the remaining 20.7 per cent of the total global silver production (USGS, 2018).

(v) Diamond

The world's largest producer of diamond are Botswana and Russia (Grynberg, 2013). In terms of total world output, Russia, Australia and Congo account for 31.6 per cent, 22.8 per cent and 19.3 per cent, respectively (So-Young et al., 2002; Ariovich, 1985; USGS, 2018). Botswana, South Africa and Zimbabwe produce 10.5 per cent, 7 per cent and 3.5 per cent, respectively. Other countries account for 5.3 per cent of the total global production output.

(vi) Platinum

South Africa is the largest producer of platinum and account for about 69 per cent of the total global production. This is followed by a distance 2nd Russia with 15.6 per cent (USGS, 2018). Zimbabwe, Canada, USA and other countries of the world contribute only 6.8 per cent, 4.5 per cent, 2.3 per cent and 2.4 per cent, respectively.

The distribution and production of other mineral resources also vary across the globe (USGS, 2018). These mineral resources include but not limited to Manganese, Mercury, Silicon, Aluminium, Gallium, Mica, Arsenic, Gemstones, Nickel, Bauxite, Gypsum, Boron, Cadmium, Tin, Cement, Cobalt, Lead, Lithium, Zinc, Feldspar, Selenium, and Zirconium

Resource Governance and Politics

To sustainably protect global resources, political scientists including political geographers have explored the political and economic implications of resource politics based exploitations, particularly the highly valuable export resources (Rudra & Jensen, 2011). Although, most of the works emphasized the negative effects of resource exploitations, nevertheless some place emphasizes on how institutions shape the relationship among actors in the production and market environments as well as between resources and politics, sometimes leading to positive effects (ibid). This has occasionally prompted writers to examine myriads of different international economic factors linking resources with politics. We intend to examine resource, governance and politics as well as the challenges in policy implications in the remaining parts of this chapter.

The politics of access, use and control of resources as well as contested knowledge has attained prominence in recent years and it is increasingly becoming a major issue in global politics (Institute of Development Studies, 2018). This is understandable considering the strategic importance of most natural resources to the sustainable

growth, economic well-being and national developmental aspirations of most states. The strategic importance of most resources often influence inter-state relations on the global scene. For instance, crude oil (petroleum) which is one of the most strategic resources around, has played very prominent roles in international politics. This is particularly so, because only a few countries have it in commercial quantity. The implication of this is that most other countries depend on the countries that produce it for the international market. Based on the strategic position of this product, a group of states formed the Organisation of Petroleum Exporting States (OPEC). The organisation made up of fourteen member states supply 43 per cent of global oil demand. It is interesting to note however, that these countries are home to 73 per cent of global oil reserves. Considering the reliance of modern and developed economies on petroleum, the OPEC have become a major world player (Mitchell, 2012).

Indeed, international oil price movement is often influenced by OPEC through 'guided'-supply/production or quota system, by which member states are allocated quota to ensure that supplies do not unnecessarily outmatch demand since excess supply control lead to low prices. Price stability and sustained revenue in-flow for the member states is consequently achieved. However, most often, international or regional tension among states, especially tension involving a major producer often triggers panic among buyers, thereby leading to price upsurge. In most cases, the oil importing western and developed countries have always been at the receiving end of an extremely high price of oil in the international market. The most recent economic recession experienced by most of the western countries like USA and Britain among others resulted from the oil price hike of between 2007 and 2008 (Kesselman, Krieger & Joseph, 2010). Even Russia that is not a member of OPEC often work closely with the body to either cut or raise supply in line with any OPEC decision. As a major producer and supplier to the world market, high oil price is to the economic advantage of Russia like any other sellers. In recent years, however, France, India, Britain and others have set timelines for a complete switch over from oil powered cars to electric and hydrogen fuel cell vehicles to address

their overdependence on oil. Historically and quite unfortunately, most oil dependent states that benefitted from high oil prices often end-up experiencing economic recession. Nigeria, Egypt and Venezuela are countries that slipped into economic recession between 2014 and 2017 after reaping bountifully from high oil prices of between $100 and $140 per barrel. Global economic recession often precipitates price collapse. This in turn often translate to reduced income for the oil exporters. The price of oil usually bounce back when the global economy stabilises (Kesselman, Krieger & Joseph, 2010). What this suggest is that, either due to improper management of oil windfalls or over dependence on oil revenue, high oil price tend to hurt both the economies of the exporters as well as that of the importers.

Getis et al. (2011) noted that the location of a very important natural resource in a border region is a potential source of inter-state conflict. One of the major reasons for the invasion of Kuwait by Iraq in 1991 was the dispute over Kuwait's oil exploration and extraction and export from the Rumaila field. The natural resource spread across the borders of both states. The two states were unable to agree on a formula for sharing production costs and revenues or on percentages of ownership. Iraq thus saw Kuwait's unilateral exploration of oil in the region as a declaration of an economic war that constituted an act of stealing of Iraqi oil. The Persian Gulf War in 1991 was a result of the ~~Iraqisadam to part of Kuwait~~. It took the intervention of the United States of America before Iraq were forced to withdraw from Kuwait.

At the domestic level, resources have often shaped inter and intra-group relations. This aptly agrees with Harold Lasswell who sees politics as who gets what, when and how. For instance, the fight over the control of oil in the Sudan precipitated a prolonged and protracted civil war that eventually led to the breakup of the country. In Nigeria, the struggle over oil has led to the emergence of militia groups and other similar agitational groups fighting for control of the oil in 'their land' (Kew & Lewis, 2010). Oil politics has often helped to shield regimes with anti-human rights posture from the critical West and the scrutiny that goes with it. Similarly, some authoritarian regimes have been able to entrench their hold on the state through patronage facilitated by oil

money or execute repressive regime (Almond, Powell, Dalton & Strom, 2008; Kew & Lewis, 2010). Example of such states include Syria and Libya under Gadhafi among others.

Apart from oil, another important natural resources that is not only critical to human existence but also shapes international politics and spurs inter-state struggle and conflict is water. The attempt of Ethiopia to construct a bridge dam on River Nile resulted in serious tension between Ethiopia and Egypt. The construction of the Grand Ethiopian Renaissance Dam, on Blue Nile was seen by Egypt as capable of a 'cut into its water supply, destroying parts of its precious farmland and squeezing its population of 94 million people, who already face water shortage' (The Times of Israel, 2017). While Egypt continued to oppose the construction of the dam, Ethiopia insisted that the dam is important to its development and sought to convince Egypt that the project would not hurt Egypt in any way.

In a similar vein, the Iranian –American conflict resulting from the withdrawal of the United States from the 2015 nuclear deal with Iran also resulted in a threat by the Iranian authority to block its water way in the Persian Gulf to oil Vessels of all other states that depend on the route for the supply of petroleum to the international market. The threat was in response to the unilateral imposition of oil embargo on Iran by the USA. About 17 million barrels of oil pass through the 'Strait of Hormuz' per day. This constitutes about 35 per cent of all seaborne oil exports (Wählisch, 2012; Rimmele & Huchel, 2018). In other words, the ban on oil export imposed on Iran is to be retaliated by a blockage of the waterway through which the western countries and others get supplies from the Middle-East countries.

Getis et al. (2011) observed that resources remain a source of dispute among neighbouring states, irrespective of whether they are valuable minerals deposit, rich fishing grounds, or a cultural site of religious significance, particularly in a border of two states. The United States engage in disputes with Mexico over shared resources of the Colorado River and the Gulf of Mexico. So also, is the US with Canada

over the Georges Bank fishing grounds in the Atlantic Ocean. Most of the conflicts are consequences of disagreement over the appropriate policy to be adopted and applied along the borders. The quest for a reasonable and fair sharing of resources has remained a burning issue in international politics (Abdullahi, 2014).

Based on the foregoing, it is clear that resources such as land, water, forests and food are often contested and divisive. Food, water, fuel and minerals have become the focus of global and local political contest (Institute of Development Studies, 2015). Land, water and green 'grabs' have re-allocated existing resources to the so called 'efficient' and economically productive users, causing local resource scarcity and dispossession, and in the process damaging livelihoods and infringing on basic rights (ibid). Resources have become of greater value, commoditised, monetized and prioritised, all of which have led to foreseen and unforeseen consequences at the domestic and international levels (ibid).

Increasingly, state actors, government, activists, residents of natural resource bearing communities and media have become increasingly interested in how effective and efficient natural resources are governed. But one may ask why should we be interested in the effective governance of natural resources? Some of the reasons why it has become mandatory are economic, especially price fluctuation or instability; political chaos or conflict that often affect socio-economic and political settings; livelihood dependency on environment; market pressure that put supplier at odd with western developed economies over high prices; and climate change and its impacts on local communities and the resources themselves (Shivakoti et al., 2017). The haphazard use of the natural resources, particularly in developing nations, is a fundamental challenge to the sustainability of natural resources and has posed serious environmental threats, particularly deforestation and forest degradation, biodiversity loss, and ecosystem degradation, reduction in soil quality, and fall in available water quantity (Shivakoti et al., 2017).

Challenges and Future Directions

The issues of efficient use of resources in their natural or processed forms and the revenue derivable have assumed greater importance. This is more so for the deplete-able resources that cannot be replaced. Yet, these resources have tremendous benefits for man kinds. Even the resources that are finite must be exploited in such a way that citizens and the state derive maximum benefits.

The changing nature of some natural resources also have negatively impact on society. For example, global warming has contracted polar ice in the Arctic, thus bringing a new area of inter-state conflict. Although concerted efforts have been made in recent years to mobilise support in the campaign against climate change, much is still required in order to achieve desired goals. The recent withdrawal of the United States from the climate change agreement is a major drawback on the progress made so far. The developed and developing countries must therefore work out a new strategy to handle the planned reduction of global warming funding activities.

The need to preserve certain endangered natural resources currently being canvassed around the world should be pursued with vigour. The justification for saving some endangered natural resources is the need for conservation for the future generation.

There is also the ecological justification. This focuses on the positive impact on organism in the environment. The various species that inhabit an environment and the ecosystem as well as the biosphere have many public service functions which are in turn essential to human survival and existence. This is without prejudice to the aesthetic and cultural values of bio-diversity that add to the quality of life. The plants, flowers, birds, mammals, insects and ocean animals help to beautify the environment and so should not be destroyed. This has been achieved to degree in developed states where the rights of animals are protected. The reverse is still the case in many developing countries where there are no concerted efforts in this direction. The argument may further

extend to the fact that the species have a moral right to exist, whether useful for man or not.

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