



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL
OF CURRENT RESEARCH

International Journal of Current Research
Vol. 15, Issue, 04, pp.24474-24481, April, 2023
DOI: <https://doi.org/10.24941/ijcr.45184.04.2023>

RESEARCH ARTICLE

STIMULATING ECONOMIC GROWTH IN DEVELOPING COUNTRIES BY RATIONAL INTEGRATION OF THE THREE PILLARS OF SUSTAINABLE DEVELOPMENT

*Eng. George MB Kaggiah, PhD.

Connex Engineering Ltd P.O. Box 21396-00505 Nairobi, Kenya

ARTICLE INFO

Article History:

Received 04th January, 2023
Received in revised form
10th February, 2023
Accepted 16th March, 2023
Published online 25th April, 2023

Key words:

Modern Human, "Must-Do" Projects, Environment, Degradation, "Polluter pays", Kyoto.

*Corresponding Author:

Eng. George MB Kaggiah, PhD.

ABSTRACT

Biblical scholars date the six-day creation at 6,025 years, while research find modern human evolved 45,000 years ago. The Universe is 14 Billion years old, the earth 4.55 billion years old, and life started 3.8 billion years ago and became multicellular 600 million years ago. Modern human evolved from *homo erectus* in Africa, through a 1.9 million years process, concluded 45,000 to 35,000 years ago. Man migrated to other continents and reached Americas 15,000 years ago. Five environmental mass extinction events have occurred at random intervals of between 50 million to 134 million years. The earliest was 440 million and the latest 60 million years ago. Man came to be 40,000 years ago. Rules of probability predict the 6th environmental extinction event as due. The first civilization was in Mesopotamia, Ancient Egypt, Ancient India and Ancient China. Man had significant environmental impacts on earth and Hammurabi, the 6th King of the Babylonian dynasty enacted the first laws on degradation in 1750 BC. Developed countries industrialised in 1700 AD and record highest Green House Gas (GHG) emissions, driving climate change, but are reluctant to take mitigation measures which could reduce their economic production. This results in difficulties in implementation of international protocols, towards accomplishing the SDGs, Carbon trading, 'polluter pays' and 'common but differentiated responsibility' in the Kyoto protocol. Space exploration, travel and exploitation started in 1957, but the reserve of an exclusive few with the capacity. This paper supplements George Kaggiah (2023) "Formation of Earth, Negative Environmental Impacts on Earth and Projection of Extinction of Life on Earth" to provide detailed base line data to facilitate rational integration of the three pillars of sustainable development; economic growth, social development and environmental protection in developing countries.

Copyright©2023, Eng. George MB Kaggiah, PhD.. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Eng. George MB Kaggiah, PhD. 2023. "Stimulating economic growth in developing countries by rational integration of the three pillars of sustainable development". *International Journal of Current Research*, 15, (04), 24474-24481.

INTRODUCTION

The earth is 6,025 years old since Creation which was at 4,000 BC according to Biblical scholars who attribute the determination to James Ussher, Archbishop of Armagh Church of Ireland and Primate of Ireland from 1625 to 1656. (Steven Ball, 2003) and (Kerry Inman, 2019). However, research Scientists propose that the universe is 14 billion years old (NASA-SAO Education Forum, 2009) In 1953, Dr. Clair Patterson established the now widely accepted age of earth at about 4.55 billion years ago, using Scientific radiometric age dating techniques (Kamel Ben Salem, 2011). Dr. Clair Patterson's findings are confirmed by Octave Levenspiel (2008, p313), who records that "in his relativity theory, Albert Einstein suggested that the universe was created 15-16 Billion years ago." Einstein's determination is considered miraculous as he had no measurement tools as were later developed by Miss Henrietta Leavitt and Edwin Hubble which eventually facilitated a more accurate measurement of the age of the universe as 14 billion years having originated from an "ever expanding" matter the size of a grape fruit in confirmation of the Big Bang theory.

J. B. S. Haldane and A. I. Oparin, propose that life started on earth about 3.8 Billion years ago in shallow seas but vertebrates developed some 600 million years ago (Stone et al, 2005) and (University of Chicago, 2022). In the 4.55 billion years that the earth has been in existence it has been impacted upon by natural phenomena emanating from within itself, such as volcanic activities or geological movement of plates in its form. Other environmental impacts on earth were caused by its interaction with the universe such as strikes by meteorites. Science has established the manner of determining that an extinction event occurred by observing its spread, intensity and density of fossils found in a relatively "thin geological layer" signifying an occurrence lasting a short period and the date of the occurrence is then determined by radiometric dating. "In 1997, Hallam and Wignall defined a mass extinction as "an extinction of a significant proportion of the world's biota in a geologically insignificant period of time." (Grzegorz Racki 2019). Literature reveals that during the pre-historic age, life of vertebrates existed on earth, for over 600 million years, obeying the laws of nature without any intervention of man. In this period, five major environmental impacts as listed below occurred and have been classified by Scientists as "mass extinction events" (Heather Scoville, 2017). Ordovician Mass Extinction was caused by sub continental drift and

subsequent climate change 440 million years ago and measured at 85% extinction. The Devonian Mass Extinction occurred about 375 Million years ago. The cause was suspected to be lack of oxygen in the oceans, quick cooling of air temperatures, possibly as a result of volcanic eruptions and/or meteor strikes resulting in 80% extinction. The Permian Mass Extinction about 250 Million years ago. The causes are yet unknown but suspected to have been possibly asteroid strikes, volcanic activity, climate change, and/or microbes. It resulted in 96% extinction. The Triassic-Jurassic Mass Extinction occurred about 200 Million years ago. It is suspected that the cause was a major volcanic activity with basalt flooding, global climate change, and changing pH and levels of the oceans. 65% of all existing life was eliminated. The K-T Mass Extinction about 66 million years ago. A 10km-15km dia. meteor hit the Yucatan Peninsula in Mexico and formed the 180km dia. Chicxulub crater driving 75% of all living species on earth to extinction and is well known for the extinction of all the non-avian dinosaurs. (Heather Scoville, 2017). Grzegorz Racki (2019), confirms the extinction events.

ENTRY OF MAN INTO THE ENVIRONMENTAL ARENA

Ted Goebel, et al (2008) found that modern man evolved from *Homo sapiens* in Africa, in a process that took a period of 1.9 million years. The modern man then migrated to all parts of the world reaching other continents at various times and arrived in the Americas, about 15,000 years ago. On September 12, 1962 President JF Kennedy confirmed the period man had been on earth when he said “[...] *the 50,000 years of man’s recorded history*[...]” (Rice University, 1962).

The National Geographic *Key components of civilization*, records that the first civilizations were established between 4000 and 3000 BC in Mesopotamia and Ancient Egypt, 2500 BC; Ancient India; and 1500 BC in Ancient China. The four civilizations are referred to as the Old World. The oldest writing started in Mesopotamia in the Sumerian language. Civilization was established in Central America in 1200 BC (Herbert J. Spinden, 1920). Environmental degradation relating to man’s activities traced back to his entry into earth by Bridgette Byrd O’Connor (2019), observation that “*Humans, having discovered and learnt to use fire, started impacting on the environment as they migrated from Africa, as they would at times set fire to the forests to drive away animals*”. Environmental degradation caused by man was for the first time made legally actionable in 1750 BC in Mesopotamia (Old Babylon) by King Hammurabi who was the 6th King of the Babylonian dynasty which ruled from 1894 BC to 1595 B.C. and enacted 282 laws which were the first in history. Environmental issues were particularly addressed in law numbers 53, 56, and 59 here below as translated by translated by L. W. King translation (1915) from three pieces of marble recovered at Susa archeological excavations between 1901 and 1902 (Harper, R., 1904).

If anyone be too lazy to keep his dam in proper condition, and does not so keep it; if then the dam break and all the fields be flooded, then shall he in whose dam the break occurred be sold for money, and the money shall replace the corn which he has caused to be ruined. If a man let in the water, and the water overflow the plantation of his neighbor, he shall pay ten gur of corn for every ten gan of land. If any man, without the knowledge of the owner of a garden, fell a tree in a garden he shall pay half a mina in money

This trend of impacting on the environment continued as the modern man became more and more advanced and sophisticated as modern humans started implementing social, economic and strategic security projects.

ENVIRONMENTAL IMPACTS ON EARTH AFTER ENTRY OF HUMAN: Collapse and disappearance of civilizations has been attributed to both natural disasters and environmental degradation. Natural disasters such as Tsunamis, Earthquakes, volcanic action and droughts have destroyed civilizations as listed below.

The Eruption of Mt Thera 1627-1600 BC: Described as the Minoan eruption of Thera volcano in Santorini, the volcanic action destroyed the Minoan Empire in ancient Greece, and its effects spread Worldwide and were felt in Greenland, Ireland, California and China (Walter L. Friedrich, et al, 2006)

Other civilizations have been affected by nature

- The Indus civilization declined as monsoons became increasingly irregular and unpredictable making farming unmanageable.
- Failure to understand and adapt to the host environment by human beings has been associated with collapse of the Viking settlement in Greenland, as the soils and the environment could not support farming and other life supporting techniques of the day.

Year 535-536 AD The Worst Year in Existence: In 535-536 A.D., as the Roman empire was collapsing, the weather in the entire globe changed, resulting in wide spread crop failure, and starvation. Volcanic activity caused the fog and darkness that triggered temperatures to drop.

The Bubonic Plague followed the cold years in 541 AD and killed up to 100 million people. Mardon, A., et al, (2021) recorded other similar destructive events such as

- The Eldgar Larva Flood 939 AD,
- Year of the Fog 1257/8 AD
- Laki Fissure 1783 AD
- (Mardon, A., et al, 2021).

The Destruction of the Mayan Empire: The Mayan Empire was destroyed by a long term drought of a period of 150 to 200 years between 760 AD to 930 AD. It was the most devastating drought the Maya had experienced in 1500 years and the worst experienced in the previous 7000 years (Gill, R. B., et al, 2007).

Extinction of The Aztec Empire 1150 AD to 1519 AD: The Aztec Empire 1150 AD to 1519 AD reached a population of nearly one million. Michael E. Smith (2005) found that huge population drained swamps, built raised fields (Chinappas) which the put under irrigation and carried out other activities which put heavy stress on the environment of Central Mexico. However according to Michael E. Smith (2006, p6)

“The Aztec civilization was brought to an abrupt end by Hernando Cortés and his invading army between 1519 and 1521. The primary cause of the Aztec defeat was the introduction of smallpox from Spain; millions of Aztecs died during the final months of resistance in 1521 and for the first five decades of the Spanish Colonial period”

The Black Death: The Bubonic Plague in 1348 killed 30% – 60% of Europe’s population reducing the world’s population from an estimated 450 million to between 350 and 375 million in 1400. This has been seen as having created a series of religious, social and economic upheavals, which had profound effects on the course of European history. It took 150 years for Europe’s population to recover. The plague returned at various times, killing more people, until it left.

Relocation Europe and Africa to the “New found lands”: Christopher Columbus arrived in Americas in 1492 AD and literally changed the world. Willem Janszoon then reached Australia in 1606 AD and Lt. James Cook dropped anchor in New Zealand in 1769. The discovery of the Americas, Australia and New Zealand resulted in an emigration of settlers from Europe to the new lands. The settlements were followed by opening up huge areas for plantations required labour from 1650 causing slave trade to become the main enterprise for Europeans. (Holger Weiss, 2018).

The Prague in London (1665-1666): The National Archives Education Services records that the great plague 1665-1666 London

was the worst outbreak in England since the Black Death of 1348. The City lost 15% of its population and experience a death rate of 7,165 in one week. A total of 68,596 deaths were recorded in London but the true number was probably over 100,000 as it had spread beyond the city.

The Fire of London in 1666: On September 2, 1666 London caught fire which lasted for 5 days. The Royal Navy under the command of Admiral Penn helped by blowing up all the buildings along the path of the fire to create “fire breaks” and stop the spread of the fire. London lost 10 Million pounds to the fire at a time when the city’s annual revenue was 12,000 pounds. The city was rebuilt with better planning by the King’s architect, Christopher Wren, who was influenced by the Italian planning and built a beautiful new City which took 30 years to complete. (The London Fire Brigade Museum)

The year 1816 Volcanic action of Mt Tambora in Indonesia: The year 1816 had a severe climatic anomaly that caused the global temperature to drop and it was referred to as the “Year without Summer” just as in year 536AD, volcanic ash had veiled the sun as a result of the volcanic eruption of Mt Tambora in Indonesia as it spewed tons of Sulphur dioxide, rocks and dust into the atmosphere and nearby islands. The eruption resulted in tsunamis which destroyed landscapes and habitat. Rivers were contaminated and grasslands and forests were burnt down. 11,000 people were killed immediately by the eruption while a few thousands died as result of the residual effects of the eruption. (Austin Mardon, et al ,2021, p47)

The first and the Second World Wars (1914-1918) and (1939-1945): Nadège Mougel, (2011), records that the First World War resulted in 20 million deaths and 21 million wounded and the second world War resulted an estimated 39 Million deaths in Europe alone (Iris Kesternich, et al, (2012). In his farewell speech of January 17, 1961, the 34th President of the United states Dwight Eisenhower, described the 20th Century as the century that had witnessed four wars all of which he described as holocausts. (*Public papers of the Presidents*, p1036)

2019 to 2022 COVID 19: COVID 19 virus (the Corona virus) originated from Wuhan in China and spread throughout the World killing a total of 6,707,741 between 2019 and 2022. (WHO Dash Board)

THE NEGATIVE ENVIRONMENTAL IMPACTS ON EARTH: The impacts on earth recorded in the literature reviewed, are divided into three categories. The first category covers the five extinction environmental events which occurred before the modern man inhabited the earth, the second category covers non-extinction natural environmental events which have impacted earth since its formation and continue to do so today while the third category covers the environmental events caused by man.

Major Environmental Impacts before the Advent of Man: It is observed that all the five mass environmental extinction events in section 1 above, occurred before man was on earth. It is also observed that the five environmental extinction events have been measured and so qualified, after they were found to have reached the threshold defined in Hallam and Wignall (1997).

An event is classified as an environmental extinction event if it results in the two conditions defined below:

- Extinction of a significant proportion of the world’s biota occurs
- It lasts a geologically insignificant period of time

The five extinction events recorded satisfied both these conditions and recorded extinction levels of 65% to 96% of life on earth that existed when they occurred. This observation increases the probability of extinction of life on earth by environmental events similar to those that caused the five recorded extinctions without the activities of man making any contribution.

Major Environmental Impacts During the existence of Man: The eleven (11No.) major negative environmental impacts on earth during the presence of man, have not been measured on the same parameters as the extinction events and therefore not directly comparable.

No.	Event	cause
a)	The Eruption of Mt. Thera 1627-1600 BC	Nature
b)	Year 535-536AD The Worst Year in Existence	Nature
c)	The Destruction of the Mayan Empire	Nature
d)	Extinction of the Aztec Empire 1150AD to 1519 AD	Man
e)	The Black Death	Nature
f)	Relocation of Europeans and Africans to Newlands	Man
g)	The Prague in London (1665-1666)	Nature
h)	The Fire of London	Man
i)	1816 Volcanic action of Mt Tambora	Nature
j)	World Wars (1914-1918) and (1939-1945)	Man
k)	2019 to 2022 COVID 19	Man

There has been 11No. major environmental events recorded during the existence of man on earth. Six events were caused by nature while five of them by man. Further events b) the Bubonic Plague in 541AD and e) the black death of 1348AD, were the most devastating as 100 million people were killed in each of these disasters. The events caused by man, though less in magnitude, are more regrettable since man is deliberate and is the custodian of the universe.

Natural Environmental Events which had continuous Impacts on Earth: Literature reviewed indicate that there are some natural environmental events which may have continuously impacted earth since its formation and were as active before man as they are today.

Natural Non-Extinction Events on earth: One observes that life was the most important element in establishing that indeed an extinction event occurred. It can therefore be adduced that such events did occur prior to the advent of life on earth, but cannot be recognized because extinction events are only manifest in fossil form and “extinction of a significant proportion of the world’s biota” had to occur. The definition of extinction events does not provide a measurement for “significant proportion” and the previous levels of 65% to 96% which occurred in the previous five extinction events, form the threshold for “significant proportion”. This deduction leads one to conclude that there have been other natural environmental events of similar kinds as the five extinction recorded, whose impact did not qualify to be categorised an extinction event but their capacity in destruction and degradation of the environment could be significant nonetheless.

The Effects of Volcanic Action in Greenland and Iceland: Greenland and Iceland has 130 active volcanoes and is commonly referred to as the “Land of Fire and Ice” because its history has always been closely related to volcanism. (<https://chandra.harvard.edu/formal/icecore>). Iceland was settled in, in 834 AD, and recorded its first historical volcanic eruption in 934AD, during which Eldagia, the longest volcanic fissure in the world, was formed. David E. White, et al, (1997, p19864), observes that Benjamin Franklin (1784) started the discussion on the perceived relationship between volcanoes and climate change when he wrote that “the cool winter of 1783 and 1784 in Europe may have been related to an Icelandic eruption”. David E. White, et al, (1997) proposed that these eruptions injected material to a height greater than 10 km and produced more than 10^8 m^3 (100 million cubic metres) of ejecta and suggested that these eruptions should be focused upon for their potential role in climate alteration due to injection of sulfur into the stratosphere.

Cooper, C, and Swindles, G (2017), found that “airborne material from high-latitude eruptions is more likely to remain in the hemisphere into which it was injected and stratospheric heating can increase the meridional temperature gradient, strengthening the polar vortex and causing alterations in stratospheric circulation and, high-latitude eruptions in either hemisphere may also have significant atmospheric effects by causing cooling in one hemisphere relative to the other, forcing migration of the Intertropical Convergence Zone

(ITCZ). Current southward migration of the ITCZ in response to anthropogenic aerosol emissions is thought to be a major cause of frequent droughts experienced by the Sahel region of Africa". These findings reveal that Nature, to date, causes more widespread and long lasting environmental impacts than man. The volume of 100million cubic metres of pollutant ejecta from the volcanic action in the Greenland and Iceland would take human activity a very long time to match.

Effects of the Sun on Earth's Atmosphere: The sun generally radiates uniform total energy referred to as "Solar Constant". The Sun-earth system has 11 years' Solar cycle. R. K. Mishra and S.C. Dubey (2023) found that on average the faculae compensates for the reduction in heat occasioned by the sun spots. R. K. Mishra and S.C. Dubey (2023) propose that light emitted from the Sun's lower atmosphere is absorbed in the Earth's middle atmosphere where it creates the ozone layer which is generated by breaking the O₂ to O₃ which protects the earth from the UV radiation.

Sultana N. Nahar (2006) asserts that: "*Depletion of ozone has created holes for harmful radiation to reach earth's surface. [...] The average temperature of the earth's near-surface air and oceans has increased by 0.74 ± 0.18 C during last 150 years ending in 2005 [...] Joanna Haig (2011) concludes that [...] TSI time series reconstructed over the past four centuries [...] estimates diverge as they go back in time. This uncertainty is a major problem in gaining a precise understanding the role of the Sun in recent global warming and projections for its future influence in the context of man-made climate change.* The California State Polytechnic University, Pomona (2017) confirms the uncertainty regarding the influence of the sun on the climate on earth by teaching that "*Think of Earth's climate as a pendulum swinging back and forth from hot to cold roughly every 10,000 to 100,000 years*".

EMERGENCE OF ENVIRONMENTAL ADVOCACY

Harper, R., (1904), records the 282 laws, some of which addressed environmental degradation. enacted in 1750BC in Mesopotamia by King Hammurabias translated by L.W. King. Mossbah M. Kolkas and C.E. Nehru (1995) found that in the Medieval Age, King Edward of England in 1310AD issued an order "Not to burn coal, as a substitute for wood, because coal caused airborne soot and Sulphur dioxide. During the industrial age (1700-1930), cities grew rapidly and many environmental issues surfaced and were discovered. George Perkins Marsh who is known to many as "the father of the environmental movement" ignited awareness in the public to the concept of potential loss and degradation of the environment when he published "*Man and Nature*" in 1864. He advocated conservancy, encouraged sound land management and helped spur the establishment of Arbor Day and forest reserves in the United States (Keith E. Whittington).

George Marsh (1864, pp44) states as follows: *The earth is fast becoming an unfit home for its noblest inhabitant, and another era of equal human crime and human improvidence, and of like duration, would reduce it to such a condition of impoverished productiveness, of shattered surface, of climatic excess, as to threaten the depravation, barbarism, and perhaps even extinction of the species*". Horace Bushnell (1868, p169), concludes that "*Not all the winds, and storms, and earthquakes, and seas, and seasons of the world, have done so much to revolutionize the earth as Man, has done since the day he came forth upon it, and received dominion over it.*"

The warnings given by George Marsh (1864) and Horace Bushnell (1868, p169), which are still current, came at a time when some major "Must do" projects, whose full environmental impact were neither known then, nor now, as the remain difficult to measure and quantify, had been planned and their implementation was either underway or in conclusion. Such projects include the Suez Canal and the Panama Canal. These two projects have had the most significant and positive effects on maritime travel and trade and their economic and strategic benefits are unmatched to date. However, their environmental impact was equally difficult to quantify.

George Marsh (1864) concluded that "*We have no present means of knowing the sum effect of natural climatological and ecological processes and it is evident that our data are insufficient to warrant positive general conclusions*"

George Marsh (1864, p.549) cautioned that: "*But our inability to assign definite values to these causes of the disturbance of natural arrangements is not a reason for ignoring the existence of such causes [...] and we are never justified in assuming a force to be insignificant because its measure is unknown, or even because no physical effect can now be traced to it as its origin.*"

Conflict between National Development Goals and Environment: The "Must do" projects are "country specific" which could be economic, strategic, tactical, or "because we can do it" projects. It is understood that they have an environmental Impact but such impacts can only be mitigated because the projects cannot be called off. In the course of pursuing national interests, nations find themselves in situations where the environmental considerations are not fully addressed. Some "must do" projects are highlighted here below:

"Must Do" Projects before Marsh (1864) & Bushnell (1868) Warnings

The Great wall of China (700BC-300BC): The Great wall of China has been built over time in sections since 700BC to 300BC and was completed by the first Emperor of United China, Qin Shihuang. The 8,850km long, 7.8m high wall which is 4-5m wide at the top and was designated a UNESCO world heritage Site in 1987. (Encyclopedia Britannica, 2022)

Industrial Age; Genesis of Mass Production and Pollution (1750-1840): Adam Smith the father of economics, referred to the machine as the "invisible hand" in production. Today's economists build models or road maps of reality to enhance our understanding of the invisible hand. IMF; Back to Basics; Economic Concepts Explained (2017, p8). Industrialisation accelerated pollution and environmental degradation.

The Suez Canal, (1859-1869): The Suez Canal is 193km, long and joins the Red Sea and the Mediterranean Sea in Africa. It allows communication of the waters of the two seas and perhaps of Arabian sea. It reduces the distance between Europe and India from 20,000km to 9,500km. The construction of Suez Canal suffered 120,000 deaths among its 1.5 million workers during the 11 year excavation project.

"Must Do" Projects After Marsh (1864) & Bushnell (1868) Warnings: The projects named have long term environmental impact and influence to a point of permanently changing the Ecosystem of the areas they occupy and the world. Some of the projects were "a must do project" for particular nations and at majority of the times some characteristics of such projects are "single option" particularly in respect to site Location, execution time; or duration of execution as depicted by some of the "must do" projects here below:

The Australian Corner Fence 1890: To protect the newly introduced European rabbits from Dingos Australia built the Southern "corner fence" or "rabbit protection fence" in the 1890. (Justine Philip, 2021)

The Panama Canal (1882-1914): The Panama Canal is 80km long and joins the waters of the Atlantic and the Pacific Oceans as well allowing ships to navigate the canal. It reduced the travel distance from New York to San Francisco from 20,900km to 8,370km.

Operation D-Day (1943): On June 6, 1943, in a single day, 156,000 men and 20,000 vehicles landed at Normandy on the coast of France. Due to the quantity of Naval, land and air force deployed, D-Day was the greatest combined action of all time. But before launching troops and the Materials to the assault on the coast

of Normandy, they had to be brought across an ocean and the northern Atlantic supply routes had to be kept open. (Dr Stephen Hart, 2004)

Construction of security fences along borders (1946-1950): The 5,614km Dingo fence in South Australia was to protect sheep from the Dingo (which is a predator) was started in 1946 and completed in 1950s. Part of the fence follows the path of the original “corner fence” or “rabbit protection fence” built in the 1890. (Justine Philip, 2021)

Space Exploration, Exploitation and Landing on The Moon: Space exploration, travel and exploitation started in 1957 and remains the reserve of an exclusive few who have developed the capability and capacity. In the famous “We choose to go to the Moon” speech by President John F. Kennedy on September 12th 1962” delivered at Rice University in Houston, Texas, the 35th President of the United States of America said.

“Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why did he want to climb it. He said, “Because it is there.”

Well, space is there, and we're going to climb it. In July 1962 as President JF Kennedy presented the budget of the space programme to the Congress he said: “Space is open to us now, and our eagerness to share it is not governed by the efforts of others. We go to space because whatever mankind must undertake, freeman must fully share.”

The Euro Tunnel (or Channel Tunnel (1988-1994): The Euro Tunnel (or Channel Tunnel) is 50km long and 45m wide tunnel across the straits of Dover which was built between 1988 and May 1994 and provide a rail link from Dover in the UK and Calais in France.

Walls and Fences along EU Countries’ Borders (1961-2022): Costica Dumbrava (2022, p4), provides a summary table of 19No. walls and fences built along European Union (EU) countries’ borders, some of which were built between 1961 and 2022. In the United States of America, a hearing before the Subcommittee on National Security of the Committee on Oversight and Government Reform House of Representatives One Hundred Fifteenth Congress First Session (Serial No. 115–22) held on April 27, 2017 presided over by the Hon. Ron DeSantis (Chairman of the Subcommittee) recorded that:

A central issue of the President’s 2006 campaign was the promise to build, quote, “an impenetrable, physical, tall, powerful, beautiful, southern border wall,” end quote. The administration is taking steps to fulfill that promise, and the Subcommittee on National Security is closely monitoring this process. The President issued an executive order on January 25 for the Department of Homeland Security to, quote, “take all appropriate steps to immediately plan, design, and construct the physical wall along the southern border,” end quote.

Cross-Continent Roads and Railways: Cross Continent roads and Rail roads have been built which have significant environmental impacts. Some of these high investment infrastructural Projects are such as:

- The 4,672km New York to San Francisco in the USA
- The 2004 Adelaide -Alice Springs -Darwin (Ghan) 2618km in Australia
- The 2,774km Adelaide-Kalgoorlie-Perth rail which is described as the “rolling hotel” run a by Journey Beyond Rail, with the whole Sydney to Perth line totaling some 4,343km and in Australia
- The 9,200km Vladivostok to Moscow rail line and road in Russia
- The 3,585km Beijing to Lhasa rail and road

CONCLUSION OF ENVIRONMENTAL SAVEGUARDS IN INTERNATIONAL LAW: There has been continuous growing concern on environmental degradation since the Hammurabi code (1750BC), King Edward of England law controlling use of coal (1310AD) and publication of “Man and Nature” by George Perkins Marsh (1864) The Environmental Age started in the 1960s driven by

Rachel Carson who published “Silent Spring” in 1962 leading to the “First Earth Day” held in April 22, 1972 in the United States of America with 20Million people taking part. (Emily Martin, 2022). This event was followed by establishment of the United Nations Environment Programme (UNEP) in Nairobi on 5th June 1972. The Environmental considerations have also increasingly featured in the dominant International Development Strategies, listed below, which target the developing Countries majority of whom gained their independent in 1960s.

- 1960s to 1980s The ILO Basic Human Needs Strategy
- 1980s to 2000 Structural Adjustment Programmes (SAPs)
- 2000 to 2015 the 8No. Millennium Development Goals 2000
- 2015 to 2030 the 17No. Sustainable Development Goals (SDGs) 2015

Currently, the overriding International development strategy are geared towards fulfilling the 2015 UN, 17No. Sustainable Development Goals (SDGs) which were ratified by 193 Nations at the United Nations Framework Convention on Climate Change (UNFCCC). Among the 17SDGs Goals No.s 8, 9, 13 and 15 address environmental safeguards.

DEGRADATION CAUSED BY DEVELOPED AND DEVELOPING COUNTRIES: Olympio Barbati (2004) observes that the nature of environmental conflicts in developing nations differs considerably from those in industrialized nations. In the latter, development has already occurred and most environmental conflicts are over how to minimize further resource destruction and how resources can be most efficiently used. In the developing countries, economic, social and political structures have not yet been widely affected by environmental changes brought about by industrialization This position is supported by the UN Sustainable Development Goals (SDGs) as Goals No.s 1-4, 6, and 8, speak the hearts of the poor third world countries and the developing nations in fulfilling their immediate and urgent needs while SDGs Goal Nos. 8, 9, 13 and 15 aim to mitigate negative impacts on the environment assessed as probable in the course of development, operation and demobilization of development projects

Olympio Barbati (2004) statement that in the Developing countries “the economic, social and political structures have not yet been widely affected by environmental changes brought about by industrialization” is accurate. There has been minimal industrial development and economic growth and in many such countries development of infrastructure is only beginning. They contribute minimal pollution. The Statement by T.C. Dougherty and A.W. Hall (1995, © FAO) here below is not applicable to developing countries since they have accomplished limited economic growth and need to develop to counter poverty and its consequences such as hunger and disease which are agents of immediate human extinction.

“In the past, the promotion of economic growth as the motor for increased well-being was the main development thrust with little sensitivity to adverse social or environmental impacts”. (Dougherty and A.W. Hall, 1995) © FAO.

This status is confirmed in WWF Report (2014,p4) who asserts that in the temperate regions, which includes the developed countries in the north, majority of natural forest and grasslands were taken up for other productive uses earlier to 1970 while in the tropics, the conversion or loss of natural habitat is comparatively new and a progressing phenomenon.

THE FIRST INTERNATIONAL ENVIRONMENTAL AGREEMENT: In 1992, 192 countries worldwide signed the United Nations Framework Convention on Climate Change (UNFCCC), agreement with the objective of stabilising Green House Gas (GHG) emissions and reducing climate change. The treaty has foundational principles, such as ‘polluter pays’ and ‘common but differentiated responsibility’, which recognised historical responsibility and fairness in addressing climate change.

The Treaty led to the Kyoto Protocol, which is an international and legally binding agreement to reduce GHG emissions worldwide, which was adopted in 1997 and brought into force in 2005.

The protocol had two main goals

- Set binding emission targets for all including the historical emitters of GHG;
- To create a mechanism for achieving those targets.

The Social, economic and strategic objectives of individual countries continue to take precedence over environmental protection and safeguards as individual economies and countries seek to sustain their economic growth and reach their projected targets. Developed countries who have historically (since 1700AD) emitted and continue to contribute the highest quantities of Green House Gas (GHG) emissions are reluctant to take measures that would reduce the emission as it would affect their national production and economy. The Scientists believed that GHG emission should have been reduced by as much as 50%-70% below 1990 levels by 2012 but the developed countries could only commit to a 5% reduction. There have been further difficulties in implementation, continued commitment and adherence. This agreement suffered a major setback in March 2001, when President G.W. Bush announced that the United States had abandoned the ratification of the Kyoto Protocol. Reinhard Steurer (2003). UN (2008) emphasizes that “*Member States acknowledged that global financial instability, rising food and fuel prices, environmental degradation and climate change require early concerted action. They also reaffirmed their commitments to ensuring the achievement of sustainable development in all countries and to making that goal the central objective of national development strategies and international cooperation*” Trusha Reddy (2011) documents that, “*while one of the world’s big polluters, the US, pushed for Kyoto’s flexibility mechanism, namely carbon trading, the USA eventually did not ratify the agreement on the grounds that it would impact negatively on its domestic economy*” (Austin Mardon, et al, 2021)

President of Kenya Address to the 77th Session, UN General Assemb: In his address to the 77th Session of United Nations General Assembly, on 22nd September 2022, the 5th President of the Republic of Kenya, H.E. Dr. William Ruto highlighted the challenges in international cooperation when he said:

“This 77th session of the UN general assembly comes at a unique moment when the entire world is struggling with multiple grave challenges that include regional conflicts, the COVID19 pandemic and the triple Planetary crisis, food insecurity and the rising cost of living.

We need to “escalate our engagement from firm consensus to decisive action. In many respects, the COVID19 pandemic stripped us of many illusions and exposed the stark justice and solidarity deficiencies in the face of existential crisis. It brought into sharp focus the global economies on two lane highway, repressively patrolled by a rising tide of exclusivist nationalism; a specter that undermines prospects of collective action and significantly impairs the resolve of the international community to guarantee fundamental rights including safety and dignity of the world’s vulnerable majority”.

It is also for this reason that many nations especially from the global south now advocate for democtatisation of the global Governance and a re-imagined multilateralism that is inclusive and works for the good of all.

Kenya National Tree Planting Campaign on 27th December 2022: To improve the National environment and economy and conformance with the Global Forest Goal 1, to increase forest area by 3% worldwide, on October 20, 2022, the 5th President of the Republic of Kenya, H.E. Dr. William Ruto announced that Kenya would plant 15Billion trees by year 2032 to achieve 30% tree cover in Kenya.

He launched this ambitious and trendsetting project during the National tree planting campaign on 27th December 2022 when he stated that:

“[...] We have all witnessed the viciousness with which climate change has unleashed various calamities on us. We are all affected by drought, flooding and unpredictable rainfall patterns, outbreak of diseases and infestation of pests. [...] The devastating disruptions occasioned by these hardships on our livelihoods and infrastructure has not only become the constant feature of our existence [...] thus imposing an extra burden on already overwhelmed peoples and Nations. To a considerable extent, these adversities are the direct and indirect consequences of human failure [...] Instead of preserving the integrity of our planet’s vital systems to enhance the earth’s livability by all creations, we have embarked on thoughtless exploitation and the insidious pursuit of prosperity in ways that do not take the environmental costs into account. Apart from causing oppressive cruel exploitation and yawning inequality which consigns billions of people to poverty, and marginal universe of limited possibilities, this [...] definition of industry and enterprise has led to climate change, pollution and loss of diversity”.

The Prime Minister of India Address Foreign Ministers of G20 in India: Prime Minister Shri Navendra Modi, of India, in his address to the meeting of Foreign Ministers of G20 Summitin Kumanakom, Kerala; India, on 2nd March 2023said:

“[...] We must all acknowledge that multilateralism is in crisis today. The architecture of global governance, created after the Second World War, was to serve two functions. First, to prevent future wars by balancing competing interests. Second, to foster international cooperation on issues of common interests. The experience of the last few years – financial crisis, climate change, pandemic, terrorism, and wars – clearly shows that global governance has failed in both its mandates. We must also admit that the tragic consequences of this failure are being faced most of all by the developing countries. After years of progress, we are at risk today of moving back on the Sustainable Development Goals. This is why India’s G20 Presidency has tried to give a voice to the Global South. No group can claim global leadership without listening to those most affected by its decisions.[...]”

1.MITIGATING ENVIROMENTAL IMPACTS OF DEVELOPMENT PROJECTS

The Royal Bank of Canada (1960), advised that “*Mankind is welcome to dominate the other forms of life, provided he can maintain order among the relentless energies whose balanced operation he has disturbed. This is a hard condition. Our past is full of sombre warnings of what happens when we fail to meet it. The evidence is in the remnants of great civilizations buried beneath mud and sand”.*

David Magintan (2012) stated that:

“Roads are a very important element of the Transport infrastructure as they contribute significantly towards actualization of National Development goals as they improve on efficiency in economic and social activities and function of communities. Roads enhance mobility and interaction among isolated and distant communities and reduce poverty”

This view was supported by Juan D. Quintero (2009) observing that: “*We are about to witness a rapid growth in road building, with at least 25 million kilometers of new roads built by 2050. 90% of these roads will be in developing countries—in areas that harbor some of the planet’s most irreplaceable refuges for biodiversity”.*The developing countries are far behind the developed countries who were industrialized in1700while the Developing countries are still on the basic needs as defined by ILO in 1960 and echoed in the Sustainable Development Goals No.s1-4, 6,and 8. Projects related with these goals are simple, small and have little environmental impacts.

Whenever planning a new infrastructure or other type of a projects, it is necessary to integrate the three pillars of sustainable development; economic growth, social development, and protection of the environment and governments are encouraged to consult with the civil society, local authorities, the private sector and the general public (H.E. Mr. Léo Mérorès, 2008)

In planning and mitigating development of infrastructural projects such as pipe lines and roads one understands that such projects affect the forests in three major ways; reduction of habitat and forest cover, interference with the free flow of animals and accidents. In mitigating these concerns it is best to deploy some of the beneficial forest management techniques and procedures which support the effect under mitigation. Price Waterhouse Coopers (2010) stated that mitigation of a negative impact can be approached from four points of action; avoidance, minimize, rehabilitate, compensate (or offset). In Forest management, appropriately spaced strips of open spaces are an important strategic tool for management as they facilitate regular patrols for policing and resource inventory and most importantly as fire breakers and a passage for firefighting equipment, while enhancing safety by affording a means of evacuation. (Cui X, et al, 2018.)

The International Handbook on Forest Fire Protection (2001, p79) in the www.fao.org domain advises that, "Firebreaks in a strict sense are linear discontinuities where the vegetation is absent or reduced to a low herbaceous layer. These breaks must be located at forest / urban interfaces or on ridges for a better effectiveness". In mitigating the environmental degradation which may be caused by a proposed road, one of options would be integrating the proposed road with the fire-break network and the spaces deforested for road can be compensated or off-set by planting trees in the existing "parallel" fire break which are replaced in the configuration which includes the road as a firebreak. The USA has the largest volume of forest roads measured at 6.5million km. (Michael Wimberly,2011, p792) Brazil has also succeeded in integrating transport infrastructure with natural habitat.

CONCLUSION

South African Reserve Bank (2002), states that: "The main objectives of economic policy are to achieve sustainable high economic growth, full employment, price stability and balance-of-payments equilibrium. Public and private institutions in a country are informed and driven by the National policies which always prioritises economic development in the country. In planning designing, implementing and operation of new infrastructure or other types of economic development projects experts involved, including the regulatory Authorities, should work together to rationally integrate the three pillars of sustainable development towards National economic development and reduction of poverty. The three pillars are economic growth, social development, and protection of the environment. Roads and pipelines maybe integrated with the forest Management strategies to give them an added environmental value rather than be viewed as having a negative impact. This will accelerate achievement of UN SDGs No.s 1-4, 6,and 8 which speak to the hearts of the poor communities whose farm produce must reach the markets beyond the forests and the water from deep in the forests shall reach them. One is encouraged to note that in Kenya, both in the distant past and the present, experts from all the stakeholders came together and deigned environmental safeguards acceptable to all and built the Nairobi Mombasa Road and the SGR railway through forests and both the Tsavo and the Nairobi National Parks. Tanzania has also built the Iringa Morogoro Road (A7) through the Mikumi National Park as similar projects have been implemented in the United States, Brazil, Australia and other countries.

RECOMMENDATIONS

In their statements in section 8 above, the President of Kenya and the Prime Minister of India point out inequality in the manner the North and the South view international cooperation and the proportionate

sharing of global resources and responsibilities. In Kenya, EMCA (2012) CAP 387 Section 9, provides the National Environmental Management Authority (NEMA) of Kenya the mandate and empowerment to carry out several core functions which include:

Section 9.2. (g): Advise the Government on regional and international conventions, treaties and agreements to which Kenya should be a party and follow up the implementation of such agreements where Kenya is a party.

Section 9.2. (k): Initiate and evolve procedures and safeguards for the prevention of accidents, which may cause environmental degradation and evolve remedial measures where accidents occur e.g. floods, landslides and oil spills.

Section 9.2. (o): Render advice and technical support, where possible, to entities engaged in natural resources management and environmental protection, so as to enable them to carry out their responsibilities satisfactorily.

NEMA are mandated and so empowered to support qualified Environmental experts working on various projects towards acceptable solutions to individual project situations. However, NEMA are also mandated to police, enforce and maintain discipline in the industry. On the world environmental arena NEMA and other Environmental Authorities in the developing countries should jointly push for the formation of a "CHG Bank" starting at 1700AD when Industrialization occurred. Each country shall therefore have an account and those wishing to offset their carbon deficit shall apply to the bank without consideration or knowledge of which country such an application would draw from. The GHG Bank shall establish an equitable manner of drawing from all the countries who have GHG savings accumulated over the past 325years. This will enable all those who The GHG Bank shall negotiate and apply the price per unit of GHG. The CGH Bank shall also have a voice in new projects on earth and the Universe.

REFERENCES

- Steven Ball (2003), A Christian Physicist Examines the Age of the Earth,
- Octave Levenspiel (2008), The age of the Universe, Oregon State University, Corvallis, Oregon, USAUDK523.31:551.5:504.06, DOI: 10.2298/HEMIND0805313L
- Kerry Inman V. (2019), The 6,000-Year-old Earth Is It Taught in the Bible, Copyright 2019,
- Kamel Ben Salem (2011) A New Approach to Estimate the Age of the Earth and the Age of the Universe, © 2008-2023 Research Gate GmbH. All rights reserved. University of Chicago
- Ted Goebel, et al, (2008), The Late Pleistocene Dispersal of Modern Humans in the Americas, Science 319, 1497 (2008), DOI: 10.1126/science.1153569
- Herbert J. Spinden (1922), Ancient Civilizations of Mexico and Central America, American Museum of Natural History, Handbook Series No. 3, Second and Revised Edition, New York
- Harper, R., (1904). The *Code of Hammurabi*, King of Babylon, about 2250 B.C. Chicago: University of Chicago Press.
- Heather Scoville (2017), The 5 Major Mass Extinctions
- Grzegorz Racki (2019), Big 5 Mass Extinctions, Faculty of Earth Sciences, University of Silesia, Sosnowiec, Poland © 2019 Elsevier Inc. All rights reserved.
- Mardon, A., et al, (2021), 535-536 AD: *The Worst Year in Existence*, Golden Meteorite Press, 103 11919 82 St, NW Edmonton, AB T5B 2W3, Copyright © 2021 by Dr. Austin Mardon, First Printing: 2021, ISBN 978-1-77369-404-7 www.goldenmeteoritepress.com
- Michael E. Smith (2006, p6), Aztec Culture: An Overview, Dr. Michael E. Smith, Arizona State University, © 2006, Michael E. Smith The London Fire Brigade Museum)

- Hallam, A. & Wignall, P. B. (1997), *Mass Extinctions and Their Aftermath*. Oxford, New York, Tokyo: Oxford University Press. ISBN 0 19 854917 2; 0 19 854916 4 (Pb).
- NadègeMougel, (2011), *General Presentation of the REPERES, Teaching Modules Connecting The History Of Europe With The History of Europeans*, European Network for Education and Training (EUNET)
- Iris Kesternich, et al, (2012) *The Effects of World War II on Economic and Health Outcomes across Europe*, Discussion Paper No. 6296, IZA P.O. Box 7240 53072 Bonn Germany, January
- Horace Bushnell (1868) *Sermons for The New Life*. Seventh Edition, New York: Charles Scribner & Co., No. 654 Broadway
- George Perkins Marsh (1864), *Man and Nature or, Physical Geography*,
- WWF (2004), *Living Planet Report*, WWF–World Wide Fund for Nature, © text and graphics 2004 WWF All rights reserved ISBN: 2-88085-265-X, A BANSON Production 27 Devonshire Road Cambridge CB1 2BH, UK, October
- Elizabeth Kolbert, (2014), *The Sixth Extinction an Unnatural History*, Henry Holt and Company, 175 Fifth Avenue, New York, N.Y. 100 © 2014 by Elizabeth Kolbert., www.henryholt.com
- Mossbah M. Kolkas and C.E. Nehru (1995), *The Beginning of Environmental Science*, Department of Geology, Brooklyn College, CUNY, Brooklyn. N.Y. 11210, and the graduate school of The City University of New York, 33 West 42 Street, New York, N.Y. 10036
- Britannica, The Editors of Encyclopaedia and Chmielewski, Kenny. "Timeline and Map of the Panama Canal". Encyclopedia Britannica, 22 Feb. 2022,
- Barbanti, Jr., Olympio (2004). "Development, the Environment and Conflict." *Beyond Intractability*. Eds. Guy Burgess and Heidi Burgess. Conflict Information Consortium, University of Colorado, Boulder. Posted: August 2004. <<http://www.beyondintractability.org/essay/development-environment-conflict>>.
- ReinhardSteurer (2003) *The US's Retreat from the Kyoto Protocol: An Account of a Policy Change and Its Implications for Future Climate Policy*. Vienna University of Economics and Business Administration, Austria, Copyright © 2003 John Wiley & Sons, Ltd and ERP Environment
- Trusha Reddy (2011), *Carbon trading in Africa: A critical review Chapter 1 Climate change and carbon trading in Africa*, ISBN 978-1-920422-62-2 First published by the Institute for Security Studies, © 2011, Institute for Security Studies
- Cui X, Alam MA, Perry GL, Paterson AM, Wyse SV, Curran TJ. Green firebreaks as a management tool for wildfires: Lessons from China. *J Environ Manage*. 2019 Mar 1;233:329-336. doi: 10.1016/j.jenvman.2018.12.043. Epub 2018 Dec 22. PMID: 30584964.
- International Handbook on Forest Fire Protection Technical guide for the countries of the Mediterranean basin.
<http://www.fao.org->27221-06293a5348df37 bc8b14e24 472df6 48 10. pdf> <https://pdf4pro.com/view/international-handbook-on-forest-fire-protection-56b151.html>H.E. Dr. William S. Ruto (2022), Address to the 77th session of the UN general assembly, New York, September 22.
- Stone et al. (2005) *The Origin and Evolution of Life on Earth*, AST 309 part 2: Extraterrestrial Life, The University of Texas at Austin
https://www.as.utexas.edu/astronomy/education/sum11/endl/secure/AST_s309_ss11_15.pdf<https://news.uchicago.edu/explainer/origin-life-earth-explained> United Nations Forum on Forests Secretariat, DESA. (2019), *Global Forest Goals and Targets of the UN Strategic Plan for Forests 2030*, United Nations New York – April 2019 – 500.
- John Patrick Grattan (1993), *The Impact of Icelandic Volcanic Eruptions Upon the Ancient Settlement and Environment of Northern and Western Britain*, University of Sheffield.
- Cooper, C, Swindles, G orcid.org/0000-0001-8039-1790, Savov, IP orcid.org/0000-0003-4218-4365 et al. (2 more authors) (2018) Evaluating the relationship between climate change and volcanism. *Earth-Science Reviews*, 177. pp. 238-247. ISSN 0012-8252 <https://doi.org/10.1016/j.earscirev.2017.11.009> (c) 2017, Elsevier Ltd.
- Harvard University, Ice Core Records – From Volcanoes to Supernovas Icelandic Volcanoes and the Greenland Ice Sheet Connection <https://chandra.harvard.edu › formal › iccore>
- David E. White, et al, (1997), *Reconstructing annual and seasonal climatic responses from volcanic events since A.D. 1270 as recorded in the deuterium signal from the Greenland Ice Sheet Project 2 ice core*, *Journal of Geophysical Research*, Vol. 102, No. D16, Pages 19,683-19,694, August
- TakuroKobashi, *et al*, (2017)*Volcanic influence on centennial to millennial Holocene Greenland temperature change*, *Scientific Reports*, May
- South African Reserve Bank (2002), *The Use of Balance of Payments Statistics in the Determination of Monetary and Fiscal Policy*, Fifteenth Meeting of the IMF Committee on Balance of Payments Statistics Canberra, Australia, October 21–25, 2002, <https://www.imf.org/external/pubs/ft/bop/2002/02-51.pdf>
