

THE EFFECTS OF NATURAL RESOURCES ON THE ENVIRONMENT AND AGRICULTURAL EXTENSION PRACTICES FOR A FARMING COMMUNITY

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Key Words

Natural resources, exploitation of resources, environmental degradation, pollution, depletion of fossils, agricultural extension practices, good agricultural practices, and resource use efficiency.

Abstract

The effects of natural resources on the environment emerge under unsustainable production systems where exploitation is faster than their replenishment or lack of it. Agriculture and manufacturing activities exploit natural resources to generate goods and services for consumption. Natural resources may produce enough for everyone but greedy consumption plays a big role in their overexploitation. The result is environmental degradation, manifested in the depletion of fossil fuels, deforestation, loss of biodiversity, decline in soil fertility, global warming, and frequent droughts & floods. They cause imbalance in and malfunction of natural ecosystems.

Agricultural extension practices aim to increase production to achieve food security and satisfy fibre needs. Whereas the practices lead to increased yields per unit of land, some practices are injurious to human health and environment. Good agricultural practices guarantee resource use efficiency to achieve target yields with minimal detrimental effects on health and environment.

This context paper discusses specific effects of natural resources on the environment and resultant socio-economic consequences. The methodology adopted was a review of research papers in context and use of secondary information obtained from Google scholar Articles.

Introduction

Natural resources are sources of inputs required in production processes to supply goods and services for consumption. Inefficient extraction, processing, manufacturing, consumption and disposal of waste lead to depletion of natural resources with deleterious effects on the environment. Attaining food security and fibre drive fast exploitation of resources. It is exacerbated by rising global population that puts pressure on exploitation of natural resources

Sustainable Development Goal (SDG) 12 estimates that global resource extraction will increase by 110% by 2060. **Conversion to renewable sources of energy is the tenable pathway towards minimizing effects of natural resources on the environment and achieve long term food security and fibre requirements for current and future generations.** Subsequent sections delve into effects of natural resources on the environment.

Methodology and Materials

TransNzoia County was selected as a farming community where agricultural extension practices have impacted on natural resources. A review of case studies conducted in the area was done, focusing on effects of cropland expansion on local natural resources. Secondary information was gathered from Google scholar Articles to enrich the local findings with global experiences.

Results and Discussion

Exploitation of resources involves extraction, processing, manufacturing, consumption and disposal of waste at every stage in respective value chains. Effects caused on the environment manifest in climate change, loss of biodiversity, and pollution with socio-economic consequences.

Causes of Climate Change

Major causes of climate change are greenhouse gas emissions. First, energy power generation is the leading cause of climate change. Need for energy to power manufacturing

processes attracts rampant extraction of fossil fuels (oil, gas and coal). Besides, electricity generation for lighting and powering industrial & home appliances depends on extraction and processing of fossil fuels with inevitable greenhouse gas emissions.

Second, deforestation gives way for farming, resulting in the loss of major carbon sinks (stores) in trees and grasslands within natural habitats with, mostly, less matched replacements. The resultant gas emissions from greenhouses and slurry from livestock grasslands cause global warming. Third, electricity is the main energy source for heating and cooling in residential houses and industrial plants, which contributes to climate change patterns. Fourth, machines used in major modes of transport are powered by energy from extraction of fast depleting fossils. Fifth, gas emissions from mining and manufacturing processes contribute to climate change. Sixth, consumption and disposal of wastes emit greenhouse gases that cause climate change.

Effects of Climate Change:

The effects of climate change include extreme hot and cold temperatures, droughts and desertification, frequent destructive storms and floods, rising oceans/seas, loss of animal and plant species, increased poverty, inadequate food supply and ill-health of humans and the environment.

Loss of Biodiversity

Human activities aimed at achieving food security and satisfactory lifestyles are responsible for the loss of biodiversity and habitats. The disastrous activities include 1) clearing trees, grasslands, and wetlands; 2) extraction of minerals (mining); and 3) construction of buildings and infrastructure. The effect is damage to life-support systems of natural resources on which creatures, including humans, depend.

Pollution of Air and Water

Pollution of reservoirs of water, air and food by gas emissions and solid deposits affect life-support systems, which become detrimental to human health and the environment. Pollution occurs at every stage of value chains during use of natural resources for production, processing, distribution, and consumption of goods and services.

Agricultural Extension Practices for A Community

Agricultural extension practices aim at increasing production by adopting good agricultural practices (GAPs), which guarantee resource use efficiency (RUE). GAPs increase yields per unit of resource while minimizing detrimental effects of natural resources. RUE involves use of resources on target enterprises with emphasis to apply right type of input, right amount (rate), right mode (single or split application), right placement (banding or broadcasting), and timeliness of operations. The case for fertilizer use efficiency (FUE) is documented by Mulagoli et al., (2000).

The potential of high yielding crop varieties and livestock breeds is realized through use of inputs extracted from natural resources and corresponding technologies. However, high yields on research stations are, hardly, replicated in smallholder farms due to low RUE (Kiplagat et al., 2022). It calls for agricultural extension practices. Cropland in TransNzoia County expanded by 38% within thirty (30) years (1990-2020) at the expense of natural forests, grasslands and wetlands (Kiplagat et al., 2022). Continuous use of DAP is reported to have acidified soils in the area.

Recommendations/Conclusion

The effects of natural resources on the environment need to be checked by 1) achieving RUE and adopting renewable energy sources, SDG 12.2; 2) reducing food and fibre wastes, SDG 12.3; 3); mitigating pollution through FUE, water use efficiency, management of slurry in grasslands, and reduced greenhouse gas emissions, SDG 12.4; and 4) exploring cause-effects connectedness of natural resources to provide remedies on socio-economic consequences.

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