**Case study : Effects of natural resources on the environment and agriculture extension practices for a farming community.**

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Abstract

In this context we see how different natural resources have effect on the environment and how they influence agriculture. These resources are such as soil, water, animal diversity, vegetation cover, renewable energy source, climate, and ecosystem services. Soil has really impacted agriculture because when it comes to structure, fertility, and different types of soil namely loam, clay, and sand which all have a purpose when it comes to agriculture. There are different types of crops which require different types of soil and without a good soil structure it would have a negative impact on the crops. We also see how vegetation cover is vital in protecting soil hence preventing soil erosion which would wash away the top soil causing infertility. Climate change also might affect agriculture in a positive or negative way it has to be moderate when it comes to temperature levels etc. Renewable energy is essential because most importantly it is clean and efficient to the environment compared to fossil fuels. In animal diversity we see how the same habitat is shared by a variety of life forms, and they are influenced by one another in a mutually dependent manner. It is also clear how agricultural extension practices have made farmers acquire different knowledge and skills that have helped them become successful in agricultural practices.

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It is now well acknowledged that attaining food security requires protecting biodiversity, including genetic resources from plants and animals. Both men and women who do subsistence farming have acquired distinct skills and knowledge regarding the local ecosystem, plant and animal species, and their products and uses. This has helped them guard against crop failure, animal losses, and malnourishment. The preservation, management, and advancement of genetic resources for food and agriculture are greatly aided by this gender-specific local knowledge. Rural women and men have a stake in environmentally sustainable development and the preservation of natural resources since they produce food. The distribution of labor in the use and management of resources between men and women, as well as the availability and control of those resources, are some of the variables that affect this stake.

Making The early 20th century American economy was centered on agriculture, employing 41% of the labor force at that time as opposed to 1.9% in 2000–2002. Through the Smith-Lever Act of 1914, Congress created the Cooperative Extension Service (CES), which was formerly known as the Agricultural Extension Service (AES). With a focus on urban and agricultural issues, Extension is currently "the largest non-formal educational organization in the world. (Al-Kaisi, Elmore, & Kwaw-Mensah, 2015) A major part of agricultural extension's work is in creating management strategies based on research on crops and livestock. This helps boost output to a point where farmers may profit and export products to other countries. Extension is a world model in many ways. However, the function of land-grant universities has been negatively harmed by financial reductions.

**Effects of natural resources on the environment**

*Soil :* The flow of water, air, and nutrients to plants is impacted by the structure of the soil, which in turn affects plant growth. Despite having little to no structure, sandy soils frequently drain freely. Although the soil's structural strength rises with increased clay content, its capacity to drain water frequently declines. For many soil processes and qualities, improved soil structural quality is necessary. It can impact, among other things, soil erosion, which includes pore-size distribution, surface sealing and crusting, compaction concerns, soil detachment, water infiltration and retention, and the preservation of organic matter and nutrients. (Blanco-Canqui & Ruis, 2018).

*Water* : A vital component of agricultural output, water also contributes significantly to food security. Twenty percent of all farmed land and forty percent of all food produced globally comes from irrigated agriculture. Crop output and productivity both increase with the efficient and safe use of agricultural water. Sprinkler systems are mostly employed in damp cool settings in research, whereas drip systems and gravity aid offset greater temperatures. (Mendelsohn & Dinar, 2003).

*Animal diversity* : animal diversity is vital, and we must stop the extinction of any species. It increases the productivity of the ecosystem, in which every species—no matter how tiny—plays an essential role. Thus, diversity is a vital sign of an ecosystem's health. It also shows that animal variety can be understood as a form of symbiosis or cooperation between species that helps to achieve ecological balance and benefits the surrounding area.

*Vegetation cover* : The ability of plant cover to absorb rainfall energy, cover a significant area of the soil at times of the year when rainfall is most intense, slow down flow, and maintain the porous nature of the soil surface makes it an efficient erosion preventive measure. Within a study Establishing plant coverings is one of the best ways to reduce erosion and regenerate the old, deteriorated soil. To be sure, protecting land, water, energy, and biological resources is essential to creating a safe environment in the future. (Zuazo & Pleguezuelo, 2009).

*Renewable energy sources* Using renewable energy sources benefits agriculture's bottom line while also making the environment greener. Farmers can lessen their dependency on pricey conventional energy sources by making investments in solar panels, wind turbines, or biofuel production. According to an article, farmers should be encouraged by incentives to use renewable energy technologies as the majority of farm machinery is powered by fossil fuels, which increase greenhouse gas emissions and hasten climate change. (Chel & Kaushik, 2011).

*Climate* : Certain plants may grow more quickly in an atmosphere with higher levels of carbon dioxide and moderate warming. Nonetheless, harvests could be lowered by more extreme heat, flooding, and drought. Livestock may be in danger due to heat stress directly and indirectly via a decline in the quality of their food source. One of the most significant effects of climate change on the agricultural industry, according to an article, is the availability of water. Nevertheless, future expectations call for it to be even more constrained. Potential evapotranspiration is the cause of the water shortage. (Mestre-sanchis & Feijoo-bello, 2009).

*Ecosystem services* : Pollination, insect control, and nutrient cycling are just a few of the important ecosystem services that biodiversity provides and which support agricultural output. The resilience of agriculture is ensured by fostering the good functioning of ecosystems, even as it intensifies to meet the strain of rising food production demands. Agricultural ecosystems are vital to human well-being because they give us food, forage, bioenergy, and medicines, according to an article. These systems depend on the ecosystem services that naturally occurring ecosystems provide, such as hydrological functions, nutrient cycling, pollination, biological pest control, and soil fertility and structure maintenance. (Power, 2010).

**Effects of agriculture extension practices on a farming community**

Farmers can obtain crucial information from agricultural extension services, including new seed varieties, crop cultivation and marketing strategies, commodity price trends, and technological training. Extension work should be determined by the needs and interests of the people; it should also be based on their knowledge, skills, beliefs, and values; it should encourage people to take initiative and solve problems on their own rather than providing pre-made solutions; an extension program should be flexible enough to allow for necessary adjustments to be made as needed to meet the needs of the people and changing conditions; it should be based on the full participation of local leadership; and finally, it should be a cooperative action involving participating in which individuals cooperate to achieve a common objective. Furthermore, extension should be predicated on ongoing assessment, with the efficacy of its work determined by the modifications made to people's knowledge, abilities, and attitudes as well as their adoption of new behaviors (Okoedo-okojie & Edeoghon, 2017). Despite the fact that farmers already know a great deal about their surroundings and farming practices, extension can provide them with new information and knowledge. The agent can be of assistance to farmers in areas such as understanding the reasons behind crop damage, basic pest control techniques, or the processes involved in the breakdown of compost and manure to supply nutrients to plants. The farmer must frequently learn new skills in order to apply this knowledge, such as technical skills for operating unfamiliar equipment, organizational skills for managing a group project, the ability to weigh the financial benefits of technical advice, or farm management skills for maintaining track of and assigning usage of agricultural resources and machinery.

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