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# CHANGING AGRICULTURAL PRACTICES AND IT'S SOCIAL AND ENVIRONMENTAL INFLUENCES

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***Abstract***

*Agricultural technology advancements are continuously taking place in India, as the progress of agricultural sector directly impacts a major proportion of population and its living condition. Farmers are interested to adopt new inventions and technologies in agriculture.*

*Modern agricultural practices are significantly affecting human health and environment. The release of greenhouse gases such as carbon dioxide, methane and nitrous oxide are adversely affecting biodiversity and increasing air, water and soil pollution. Agricultural residue management, use of pesticides and insecticides, inorganic manure, chemical fertilizers leads to harmful effect on human health and increasing environmental pollution. Recent agriculture trends emphasizes on enhancing agricultural production in terms of quantity in less time, overlooking its adverse affects. In this paper we have analyzed the negative effects of modern agricultural practices on human health and environment. It leads to decline in soil fertility, loss of biodiversity, climate change, air, water and soil pollution, environmental degradation etc. Our farmers are now adopting modern agricultural techniques, using chemical fertilizers, pesticides, insecticides, expanding irrigation facilities, using high yielding varieties of seeds, modern machines, varying crop sequences etc. But these efforts of expanding food supply in less time is taking place at the cost of human health and environment degradation. Spray of harmful chemicals on crops not only pollutes underground water and air but also bad for human and animal health. Non harmonious, unwise and unsustainable agricultural practices have a considerable impact on environment and also harmful for living beings.*

***Key Words:*** *Environment, Modern Agricultural Practices, degradation, unsustainable, techniques.*



## Recent Trends in Agriculture and Its Impacts on Human and Environment

Recent trends in agricultural are not sustainable. The present developments are taking place at the expense of future generations. Over exploitation of resources and irresponsible farm output planning are generating pollution and damaging natural ecosystems. Global

warming, climate change, soil degradation, over consumption of water, increasing soil, water and air pollution, increasing human diseases are the consequences of modern agricultural practices to a great extent. Producing maximum yield in minimum time is the main motive of today's farmers overlooking its human health and environmental consequences. Increasing use of pesticides and chemical fertilizers reduces the economic cost of production with increased yield but these are very harmful for human health and environment. These are an obstacle to the development of sustainable agriculture. Many countries have implemented policies to regulate the quantity and type of chemical fertilizers, pesticides etc. in farming. The fertility of soil is reducing day by day and underground water is polluting. Excessive use of chemical fertilizers and pesticides also kills the pests useful for plants.

Modern farm practices and agriculture are different from traditional methods of agriculture. New machines for farming, advanced technology, devices, sensors, information technology, weather forecasting technology etc. have made farming much profitable, easier, safer and efficient than before. These provide farmers to have more control over their farm crops. But at the same time its negative effects cannot be neglected. Climate change and agriculture are interrelated. Global warming is affecting agriculture through changes in temperature, precipitation etc. These are making agriculture more uncertain side by side increasing its economic and social cost. Agriculture have its significant effect on environment through the production of harmful gases such as carbon dioxide, methane and nitrous oxide. Use of chemical fertilizers, pesticides and insecticides in farm releases ammonia, nitrate and phosphorus. In addition it also releases air, water and soil pollution as well as it is harmful for biodiversity. Farming is also changing the land capacity to absorb and reflect heat and light. Soil quality is also deteriorating due to farm malpractices. Soil degradation can be seen in the form of salting, water logging, declining soil quality, low fertility, pesticide pollution, altering soil acidity, salinity, alkalinity and erosion. Improper water drainage from farms results in water accumulation and water logging. After evaporation, excess water from field causes soil salinity which is harmful for crop growth. Excessive use of chemical fertilizers in farms also pollutes underground water. Modern agriculture is utilizing seeds of high yielding varieties which increases crop production and also profit level of farmers. But they require intensive use of water and chemical fertilizers which kills plant friendly pests also. Moreover this technique is also very harmful for human health and environment. Intensive agricultural practices put more pressure on soil by reducing its fertility and available nutrients.

Modern agriculture utilizes mechanized harvesting of paddy and wheat crop most prominently. But it left large volume of stubble and straw residual on field. Example of paddy residual burning could be seen in case of Punjab and Haryana in India. This case of crop mismanagement depicted in the form of winter smog and other health problems in Delhi and north India. These practices are also harmful for soil quality and its productive capacity. Rice residue burning impacts both on-farm and off-farm areas. It reduces soil nutrients, organic matters in soil, production, air quality, water efficiency and biodiversity, human and animal health. It increases environment pollution tremendously.

The social and environmental effects of modern agriculture are at the alarming stage. Environment and agriculture are inter-connected. As modern agriculture is becoming more intensive, farmers are now able to produce higher yields, utilizing less labour and land. No doubt these methods of farming are more profitable but its environmental impacts have increased soil degradation and water resource degradation, both are important for farm productivity and human health. It is true that relying on excessive use of chemical fertilizers, pesticides and technological inputs increase higher yields per acre. Farmers are forced to apply intensive agriculture on fields, to remain competitive in the modern technological world. Its harmful effects can be seen in various forms. Rapid erosion of fertile top layer of soil from farmland is harmful for farm productivity and environment. It takes upto 300 years for 1 inch of farm topsoil to form. Damaged top layer of soil is almost irreplaceable and its long term crop yield consequences cannot be overlooked. The amount of fertile top soil erosion of farmland differs considerably due to slope of the field, type of soil, farm drainage system, crop management practices, etc. Erosion removes the top layer soil and affects its productivity. Surface soil contains organic matters, fine soil particles, plant nutrients etc. They provide nutrients and retain water for the root of the plants. The sub soils that remain due to erosion are less fertile, less absorbent and less able to retain pesticides, fertilizers and other crop nutrients. The long terms loss of soil fertility and its water holding capacity cannot be overlooked. The long term negative effects of low farmland productivity, environmental and health problems are far greater than short term economic benefits of the farmers.

Agricultural practices directly effects local climate and regional climate. Those rivers that are connected with drainage of farmlands, receives harmful pesticides and chemicals. Agriculture discharges pollutants and sediments to surface and underground water. Agriculture also uses polluted surface and underground water for irrigation which

contaminate crops and transfer diseases to consumers and farm workers. The depleting water quality is a matter of great concern. The associated agro processing industry is a source of organic pollution. Freshwater aquaculture is also a problem leading to ecosystem damage. Intensive agricultural practices lead to increase in nitrogen levels in underground water. Nitrate level is increasing in drinking water which causes human cancers. Nitrogen pollution of underground water is also creating problems. Nitrate concentration is mostly high in those water bodies which are near to paddy fields. High level of farm contaminants in food and water have serious implication for reproduction and human health. Improper agricultural practices are impacting water quality of a region. Chemical fertilizers and pesticides get mixed to underground water that is used as drinking water by human beings. Oils, degreasing materials, toxins and metals from agriculture equipments get mixed in underground water. It creates health problems when used for drinking water.

Use of heavy machinery on soil for growing crops results in soil compaction. It leads to increased density of soil, reduced air volume and reduced soil capacity to drain off surplus water from field. Soil compaction reduces the long term ability of farm land to produce food. During the last few years the weight and size of farm machinery has been significantly increased which harms soil compaction on fields. Soil compaction reduces the crop yields. Soil structure degrades due to heavy loads on soil. It adversely affects soil functioning and restricts nutrient cycles. This results in less crop growth, less total yield, soil erosion, reduces underground water recharge, greenhouse gas emissions and loss of biodiversity. Top soil compaction is temporary and controllable but subsoil compaction is permanent whose functioning cannot be restored after deterioration. Improper methods of tillage cause soil compaction. It reduces soil pore size, restricts plant root growth and nutrients accessibility. Use of heavy farm machinery on farmland also alters soil physical properties by decreasing nitrogen availability in soil and reduced efficiency of nitrogen usage by crops. This may require increase in the use of fertilizers. It also influences soil biodiversity. All these causes affect plant growth negatively and lead to reduced crop yields. Changes in organic composition of soil impacts crop quality and ultimately human health.

Modern agriculture is also a source of air pollution. Ammonia gas releases from heavily fertilized fields and livestock waste. When combined with other air pollutants, it get change in tiny solid particles. These particles get penetrate deep into lungs and causes heart disease. Apart from reducing air quality these practices are also creating many health problems.

Agriculture has experienced many technological advancement but adverse health effects from agricultural occupational exposures has also been increased with that. Farmers are increasingly exposed to many health problems such as respiratory problem, arthritis, skin cancer, hearing loss, adverse reproductive outcomes, stress, mental health, injuries, physical illness etc. Widely used chemicals and pesticides in agriculture increases health problems and environment pollution. Farmers use pesticides in excess quantity and do not take proper safety precautions. Cost of medical treatment, lost labour and lower long term productivity can be high than the benefits of pesticide use. Farmers generally lack knowledge, training and information about using appropriate quantity of pesticides and chemicals on farm land. These are toxic to human and other species. Improper use of pesticides can caused adverse health effects such as stinging eyes, rashes, blisters, blindness, nausea, dizziness, diarrhea and death. Its long term effects can be seen in the form of parkinson disease, asthma, depression, anxiety, cancer, reproductive malfunctioning, diabetes, alzheimer diseases etc.

Fertilizers contain harmful elements such as nitrogen and phosphate which deteriorates air and water quality and ultimately human health. Modern agricultural practices increases the level of greenhouse gases in the air. Pesticides and chemicals are used to produce more crops. These are transported through wind and water and harm the surrounding ecosystems. The same is the case with fertilizers. These are nutrient for plants and get transferred to streams and lakes in higher amount. An excess amount of nutrients in a water body results in substantial growth of plants such as algae. Due to an increase in plants or algae, the oxygen level decreases in water and fish begin to die, thus harming aquatic ecosystem. Further, The water plants and animals start dying due to low oxygen level. The dead parts get accumulate at the bottom of water bodies thus causing threat for its existence. This process is called 'Eutrophication'. Agriculture utilizes many toxic substances. The concentration of toxic substances increases many times when it is transferred from one organism to another in a food chain. This process is known as 'Bio-magnification'. Modern agriculture is harming bio-diversity.

Agriculture is also a leading sector in creating global warming. It contributes directly to greenhouse gas emissions. According to the report of Intergovernmental Panel on Climate Change, main causes responsible for increase in greenhouse gases observed over the past 250 years are fossil fuels, land use and agriculture. Release of carbon dioxide is through deforestation, release of methane is from rice cultivation and enteric fermentation of cattle,

release of nitrous oxide is from fertilizer use. Global warming is also due to increasing use of pesticides and fertilizers, fuel and oil for tractors, equipments, trucking and shipping, electricity, cooling and heating etc. Supporting industries for agriculture are also contributing for release of greenhouse gases in environment. Increased fertilizer use in agriculture is largely responsible for rise in nitrous oxide in the atmosphere. The nitrogen based fertilizers stimulates microbes in the soil to change nitrogen into nitrous oxide more rapidly. This gas contributes to global warming. Modern agricultural practices emit many greenhouse gases as carbon dioxide, methane and nitrous oxide. These gases also destroy stratospheric ozone, which protects us from harmful ultraviolet rays. A large proportion of methane in the atmosphere comes from domestic ruminants, forest fires, wetland rice cultivation and waste products. Modern agriculture sector contributes to the increase in greenhouse gases in the atmosphere, however this sector itself depends on climate variation to a great extent. The main determinants of crop growth are solar radiation, temperature and precipitation. Climate change significantly impacts farming conditions, food supply and food security. Increased carbon dioxide in the atmosphere and rising temperature affect rice yields and the amount of methane that is released by rice paddies. High temperature causes lower rice yields. Rising global temperature is one of the bad effects of modern agricultural practices.

The climate change further effects human health adversely. Human beings and animals depend on food, water and air for their existence. To remain healthy these resources must be available in good quality. But modern farm practices utilize many harmful fertilizers, pesticides, insecticides, genetically modified crops etc. which creates health risks for the people. Many toxins and chemical compositions, which are present in food are risky for human health. Food safety in quantitative terms is being provided to rising population neglecting its qualitative aspects.

Modern agricultural practices, based on output maximization and market oriented motive, are changing the ecology and disease pattern in human being. More intensive and less diverse farms are affecting quality of food production from farm seed to consumer's plate. The food is highly processed and less nutritive which have negative effects on human health, ecosystem and bio-diversity. Modern agriculture is growing by ignoring its costs in terms of loss of biodiversity, harm to ecosystem, animal and human health, declining food nutrition, degradation of natural resources including water, air and soil, environmental pollution etc. Modern farm practices focus on more crop quantity in less time and profitability of farmers overlooking its efficiency, quality and sustainability.

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