

# Impact of Agricultural Development on Environment

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**Abstract**—*The blame is often put on industry that emitshuge amount of smoke and other pollutants. This may partly be true as it is not wholly responsible for the environmental problems that the society is faced with these days. Quite a lot has happened in agriculture in this century that has contributed its share of ecological disorders. Again, it is being felt that new agricultural technologies using an increased dose of inorganic intents have adversely affected nature, and that traditional agriculture has been neutral to it and its operations. This may again be a fallacy but it also points to the fact that with the increased adoption of inorganic technologies, conflicts of agriculture with natural equilibrium may have increased considerably. That mankind is closely linked with environment and its very existence is likely to be threatened if natural disorders go beyond a point, should sound be enough a warning to all of us to direct our keen attention to the problems of environment and the measures to be adopted to rectify the disorders that have already taken place and to prevent future disequilibrium taking place. It is in this respect that a study of agricultural development and environment has assumed importance. In this research paper an effort will be made to examine the harmful effects of agricultural growth on environment and what can be done to prevent these effects taking place in future.*

## 1. INTRODUCTION

Agriculture and development have an old age and permanent relationship with each other. Perhaps no other human effort has interacted with environment as early as agriculture did. Yet the concern for environmental degradation is of recent origin. This often creates the impression that agriculture is not in conflict with natural harmony and does not have adverse effects on ecology.

### 1.1 Need and Importance A

Ever since man started realizing the existence of his entrepreneurial qualities and the urges of going his own way, the exploitation of nature began. When man no longer wanted together food that nature produced for him, he started working against it by clearing patches of land and growing the food he wanted. Soon came in the felling of trees for fuelwood and then for timber leading to the clearance of forest areas which later became responsible for the degradation of soil. Man started this onslaught against nature out of a compelling situation emanating from the multiplication of mankind. Had nature drawn its limits beyond which man's onslaught would not be permitted, perhaps the nature of things would have been

entirely different. Nature has learned only to give and not to refuse and the aggressive man never relented in these efforts to exploit the natural resources. Agriculture had to be in the lead to bringing about the natural disorders as its ever increasing greed for land went on unabated. Over time the intensity of harm that agricultural growth has done to nature has increased owing to man's compulsion of producing more and more food and over agricultural commodities and in the process, using more and more inorganic inputs in farm operations which have come to be identified as harmful agents in nature's operation. . \*

### 1.2. Hypothesis\*\*

The hypothesis of the paper is as follow :

- i. What are the environmental issues of agricultural development.
- ii. What can be done about the adverse effect?
- iii. Whether the benefits derived from the project are worth the environmental damages sustained?

### 1.3. Objectives\*

The main objective of the paper is as follow:i. To analyze the environmental issues of agricultural development.

- ii. To assess the causes of environmental degradation.
- iii. To put some suggestions for sustainable environment.

### 1.4. Methodology

A descriptive methodology, based on secondary data derived from books of eminent authors, research published works and from various sources is adopted for the purpose.

### 1.5. Some Environmental Issues

Evolution of new technologies has always resulted from the recognition of the fact that resources available to mankind are scarce. Intensity of use rather than extension should be the approach to the optimization of natural resources, and this leads to the development of sophisticated techniques from time to time. Should it, and then imply that man has sought use resources up to an acceptable limit only and has stopped mounting further aggression nature? The answer is, obviously,

no. New techniques were and are being developed to meet the ever increasing demand of mankind without regard to maintaining balances on this planet. Had mankind not ignored its responsibility towards preserving the natural balances (and, in the process, towards his own future), the present state of affairs could have been avoided. That it has not been done explains sufficiently why we are feeling alarmingly concerned with ecological problems now. For centuries, man's aggression against nature might not have resulted in any kind of imbalance till, of course, mankind started enlarging at a faster rate, and the lack of required techniques necessitated shifting to new and easily accessible lands rather than using the areas already cultivated. This unending exploitation of nature started causing disequilibrium in the environment on a large scale. The technology developed over time did not help much. While it enabled the deepening of the resource use at its present level, it certainly did not prevent further exploitation of whatever was left. Much less effort was made to replenish the resources. Nature, therefore, retaliated by creating agricultural instability in the following manner:

- i. Reduced water supply.
- ii. Increased floods.
- iii. Spreading crop diseases.
- iv. Resulting in higher cost of production.

The impact of agricultural development on the environmental situation is now more complex and manifold. Agriculture is heavily dependent upon industry and many a product produced by the industry and causing harm to environment are meant for agricultural development only. Thus industry and agriculture, together, are harming the environment in the greater measure than at any time in the past. New agricultural technology having many inorganic components has produced highly harmful effects on nature. It is reported to have affected the earth's crust and the useful bacteria, besides upsetting the ecological balance in its own way.

An increased use of chemical fertilizers has been hardening the upper layer of the soil and with each successive crop season, the tractors have to be so designed as would dig deeper. With each such exercise, the depth of the hard layer goes increasing and this makes the soil barren for future cultivation. For how long tractors shall be used to dig deeper should not be hard to understand and unless the process is immediately reserved through some alternative technology, it might threaten the whole process of agriculture in not a too distant future.

Hardening the upper layers of the soil destroys the moisture retention quality of the soil which not only reduces its potential for growth of vegetation, it also deprives it of its capacity of holding rain water and preventing low lying areas from getting inundated. Many a times, it has come to notice that during the rainy season the highland soils subjected to inorganic inputs do not retain rain water in any appreciable measure.

The whole of the rain water flows down. It acts as a double edged weapon. The highlands do not retain moisture which is essential for living organisms such as earthworms and other useful bacteria which in turn are highly conducive to the agricultural crops and on the other hand, the low lying areas get inundated, threatening the standing crops and also bringing large scale destruction to these areas.

These occurrences upset Nature's balance in more than one ways and have alarming consequences for our future. It immediately affects the flow of water of perennial sources which is likely not only to create difficulties for irrigation purposes, but also the supply of drinking water. It also has the potential of spreading the deserts not only the ways it is explained herein alone but also out of the compulsion of clearing more forest areas to search for better agricultural lands. The spread effect of these activities is so devastating that the entire ecological balance can get upset beyond repair.

Inorganic farming has also resulted in the crop genetics suffering from many diseases and new rusts have come to be known which defy all advances in agricultural research. New pests develop and crop genes become resistant to new pesticides and other inorganic treatments. It is reported that food losses. Owing to pests and diseases are about one- third of the total productions. The loss varies between 10 and 25 percent in the advanced countries and goes up to or over 50 percent in the less developed countries where agro-chemicals are not developed to the extent it has been done in the in the countries. "In an ideal application of pesticides, the chemical should fall exactly on the target organisms. But this never happens as only one percent of the pesticides hits the target pests while the remaining drift into the environment. The numerous available evidences suggest that pesticides pose potential health hazards not only to the livestock and wild life but also to the creatures dwelling in the hydrosphere, rhizosphere, and soil. It has been observed that they stimulate or suppress growth in animals and plants, increase the susceptibility of plants and animals to disease and affect the natural evolution of species in some regions." MIT is also reported that whereas industrial pollutants can be subjected to several treatments, agricultural pesticides are usually not amendable to such treatments. These pesticides also have the potential of contaminated air, water, soil and other environmental systems. The evil effects can also be transported to animal life and finally, also to human life. Pesticides, besides being health hazards, have also resulted in the reduction of production. It is believed that the uses of some of the pesticides have resulted in the fall of egg production from 8 to 18 percent and have also caused their breakage. Consumption of pesticides contaminated food is a sure killer. It is reported that around 75,000 persons suffer from pesticide poisoning every year. Two- thirds of pesticide-related deaths occur in the developing countries only owing to ignorance and illiteracy. So long as pesticides are an important element in the new agricultural technology, the agricultural growth will continue to affect the environment adversely.

Production of safepesticides is only a myth and it is emphasized that the future course of pesticide production should be along the lines of selective and non-toxic products. Most of the industries are engaged in the production of pesticides for use in agriculture. Bhopal disaster is associated with the factory producing pesticides. The foregoing discussions amply demonstrate how agriculture and environment can come in conflict with each other. That this conflict was not recognized in time has led to different forms of environmental degradation, like deforestation, erosion of soils, flood havocs, water-lodging, and air and water pollution, besides other problems of soil destruction. The adverse effects of agriculture and its growth on environment may be more indirect than in industry. Agricultural development is needed, therefore, an irrigation project has to be undertaken or a multipurpose project is to be taken up. These projects result in several problems such as destroying plant-life at one place and submerging vast forest areas at another, displacing people at one place and their rehabilitation elsewhere, clearing forest at one place and attempting to compensate for these at an alternative place. Can these displacements be perfectly substituted elsewhere is quite a difficult job. While such projects are immensely important for agricultural development, how much cost do we have to pay in terms of degrading environmental condition has to be carefully considered. It should not so happen that while safeguarding our present, we mortgage our future. \*Whereas an industrialist can be made to adopt norms so as not to produce at the cost of society, there seems to be no possibility for such a regulatory measure in agricultural production. Inorganic elements of new farm technology have been used at great social cost. These help the individual farmer but how much the society has been paying for it has not been calculated. A more pertinent question arises which should invite the immediate attention of the planners, will the present agricultural development sustain itself the way it is going? This point to an exercise of rational exploitation of what environment is offering to mankind so that the future generations with even greater demands do not charge us with cruelty. Optimum exploitation of natural resources, avoiding excessive use, on the one hand, and giving sufficient attention to the processes of replenishing, on the other, shall have to be adopted. There, of course, is lot of evidence that this exploitation has been reckless and immediate correctives have to be adopted. One of the important elements of the new farm technology is assured irrigation. In areas where irrigation was assured, it worked wonders including exploitation of avenues of irrigation in other areas. This resulted in digging of wells on a large scale. In the process, instead of optimal use of water, excessive use was made. This affected in two ways. On the other hand, the problem of salinity arose and on the other, the water-table started going deep down to an alarming proportion. This over-excitement of adopting the new techniques makes us indifferent towards the future consequences and hence excessive use of the revolutionary technology. In some places, even water-lodging is reported to be causing concern. In a

country of acute scarcity of land, wasting some areas owing to water-lodging can be ill-afforded. The proportion of water-lodging area to the total irrigated area is reported to be varying between 7 percent to around 30 percent. This only points to the dimensions of the danger involved in the development of agriculture when it is not farmed thoughtfully. Similar problems arise with respect to those activities where forest resources are used. Excessive use of already depleting forest resources without giving sufficient attention to its regeneration is causing concern.

Such activities which do not take care of ensuring perennial flow of resources in the future will one day automatically grind to a halt. Caution is also being sounded against wrong policies of fisheries development. In the haste of catching up with other countries, there always is a temptation to discount the present at a rate higher than that of rejuvenation and it is in that temptation that the seeds of trouble are sown for the future.

Ecological disorders are operating harshly on the poor for whom so much of concern is shown all over. The exploiters are often the affluent people and the sufferer, the poor, who more than anything else depend on the prosperity of agriculture in the country-side. Although the village poor, agricultural labor, small and marginal farmers are partly themselves responsible for the environmental deterioration around them, Yet the fact remains that they have been getting the support from the natural resources, without which they could not survive. This natural support has vanished as a result of unscientific exploitation of the forests and other natural resources. In some cases, The damage is quite high and is adversely affecting even the successful implementation of the poverty alleviation programs, it has been discussed earlier how new agricultural technologies have resulted in the environmental degradation. It is argued that traditional agriculture has also been acting against nature. It is true that some traditional practices such as reckless grazing, forest clearing, putting forests ablaze and some such things acted against environment, but these could be overcome through proper awareness and widespread education. The damage caused by the commercialization of traditional pursuits is irreparable and that has to be checked.

In studies conducted all over the world, it has been seen that "organic farming can still be adopted without affecting the quantum of production." A study from Karnataka Western Ghats has shown that "unscientific over-exploitation of forests has fully silted up three of the five perennial irrigation ponds and reduced the area irrigated from 17 to 9 hectares." The same study concludes that through proper management of its eco-system, the economic conditions of the people in the area could be improved substantially through increased employment. A study in Andhra Pradesh showed that "Continuous mono-cropping of new seeds of cotton with the indiscriminate use of chemical fertilizers resulted in ecological disorders and falling yields." This clearly showed that

inorganic farming results in a change in the ecosystem. Constant disorders in agro-ecological conditions will certainly threaten long run perspectives of agricultural growth. The study brings out the importance of diversified farming and use of organic fertilizers in order to check the ecological disorders. There are several other studies---though not many and not from all areas---which show it beyond doubt that the nature and method of agricultural development is posing problems to the environment that can bring about harmful effects in an ample measure. Thus, before it is too late, Policy measures should be adopted to restore the balance between agriculture and environment. The approach, as it is rightly pointed out by the researchers, should be a combination of economic, institutional and technological measures.

In a welfare state, economic decisions cannot and should not be taken only on private costs. Each individual economic enterprise has to be balanced against the cost a society would be expected to pay. This might help in making the correct decisions and allowing only the most appropriate technologies and cropping pattern to be adopted. To augment growth, on the one hand, and to check waste, on the other, some package of incentives and taxes shall have to be introduced to give the agricultural economy the right type of orientation and the desired direction. A bold and objective policy is to be adopted at the national level with a clear thinking of steering the country of the pitfalls of both traditional and new agricultural technologies.

The government shall have to formulate a careful policy on pesticides. Some of them may have to be banned and the use of others regulated. Agricultural growth should not aim at increasing production alone; it should aim at overall transformation of the village economy providing sufficient safeguards for the poor. Scientists are unhappy on finding the traditional varieties of seeds almost extinct, which they feel is going to pose serious problems for the future. While, therefore, making advances in agricultural technologies, aspects of future stability should not be overlooked, and while ensuring reasonable agricultural prosperity at present, we should not preside over the future gloom.

### 1.6. Conclusion and Suggestions

Propagating the benefits of seeds are alright but alternatives ensuring the continuation of traditional varieties with matching results should not be ignored. In the United States of America, experiments have already been initiated to revert to organic farming with better management skills and close supervision and it has been observed that these alternatives have given us proximate results as with inorganic farming without, of course, its evil effects. Perhaps, some kind of blending of the two would solve many problems. Traditional practices may help preserving the environmental equilibrium while the new agricultural strategy may help meeting the high demands of agricultural products.

Future course of agricultural development, therefore, shall have to be chalked out carefully if it is to be ensured that no more degradation of our environment takes place. Some of the important points to be kept in mind may be listed as under:

**1.6.1. Suitable Water Management.** Water is the life line of our fields and an important component of the new inorganic technologies and hence there always remains a strong temptation to over use water. Not only water needs to be used rationally but proper awareness shall also have to be created against the evil effects of excessive water application. The distribution channels of limited water supplies shall have to be designed carefully so that wastage of water is avoided. Digging so many wells by individual farmer s may neither be economical nor even desirable. Community wells may be dug and supply of water granted on need- base at uniform prices. Command area should pay greater attention to water management, so that results are optimized. Salinity and water logging should not be allowed to occur.

**1.6.2. Afforestation Policy.** A forest policy suited to the upgrading of environmental aspects should be designed. Perhaps the plants shall have to be selected not only on the consideration of quick growth but also in terms of their effects on agricultural development and environment \*.It is reported that some species of plants adopted for social forestry have resulted in a considerable fall of the water-table which might threaten other forms of vegetation. Should such a thing be proved, alternative species should be developed immediately so that the harm to environment is minimized. It has often been noticed that large scale plantation takes place every year but due to poor watch and ward and practically no maintenance, a sizeable part of this plantation is wasted and it does no good to the environment. Reckless exploitation of the existing forests is still going on and encroachments on forest lands are common. Strict measures shall have to be taken to check this menace. In many cases, It has been reported that due to overgrazing in the past, there exists hardly any grazing facility in the rural areas now and it is directly responsible for the failure of animal husbandry component of the I. R. D. P. Forest cover is essential to the harmony of rural economy and it is to be pursued with that point of view as well.

**1.6.3. Suitable Input Mix** Input mix that shapes a technology shall have to be a designed carefully. The seeds, fertilizers, pesticides and agricultural implements have to be combined in such a way as would meet the present challenges and would also ensure stability in the future. For arriving at an optimal combination, farm education and management shall have to play an important role. Different varieties of seeds to suit different agro-climatic conditions should have developed keeping in view the experience gathered so far. Some chemical ingredients shall have to be provided to check the hardening of the upper crust of the soil and not to damage its retention capacity. Pesticides pose a far more serious problem. As already explained, these can become big health hazards

unless used properly and in desirable quantities only. Greater caution shall have to be exercised in this regard keeping in view the socio-economic conditions of the country. The use of modern agricultural implements shall have to be weighed against the prevailing employment position in the countryside. Those mechanical devices which help in deepening the agricultural operations and intensifying the labor use should be developed and adopted under the TRYSEM scheme. It will be desirable to give training in modern farming as well so that more and more educated people in rural areas take to farming as a source of livelihood. Whereas the new technology should help in reducing drudgery, it should no way result in the displacement of labor.

**1.6.4. Suitable Cropping Pattern.** A suitable cropping pattern is equally important. Environment should be allowed a free play and not made to behave every time according to the whims of man. While new cropping patterns based on market decisions will evolve themselves from time to time, by adopting suitable policy measures, the desired direction shall have to be given to them so that they help in the maintenance of environmental balance. Such exercises are warranted in social and agro-forestry as well. The plantation of those trees which do not cause imbalance should be promoted. For example, trees affecting adversely the water level should be avoided. Researchers will have to be undertaken to evolve suitable cropping patterns.

**1.6.5. Rural Development. Strategies.** In the ultimate analysis, all rural development programs are linked with agriculture in one or the other way. Such developmental activities as are likely to affect agriculture in an adverse fashion should be avoided. The activities will have to be

selected according to the region specificity. If the animal husbandry activities are promoted in areas deficient in forest and grazing lands, it will lead to considerable damage to the forest and grazing lands by overuse and will upset the environmental conditions. On the other hand, rural development activities based on agricultural by products and forest waste should be encouraged. These would be income-generating, on the one hand, and help in the improvement of total environmental position of the village, on the other. Activities of health and rural sanitation should be suitably designed to encourage the environmental improvement activities. The farmers should be encouraged to raise agro – forests which will augment their incomes and simultaneously improve the environment as well.

**Abbreviation** TRYSEM Training of Rural Youth for Self

Employment. I.R.D.P. Integrated Rural Development Programs.

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