
INTER-RELATIONSHIPS BETWEEN FOOD POLICY AND ENVIRONMENTAL POLICY IN CONTEMPORARY POLICY PRACTICES IN INDIA.

HOW THE POTENTIALLY CONTRADICTIONARY ASPECTS MAY BE OVERCOME?

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Linking environment and food production

During the last twenty-five years, farmers in developing countries have risen to an enormous global challenge. In stark contrast to the Malthusian hypothesis that the world will run out of agricultural land due to geometrically burgeoning population, the world currently produces huge surpluses of food and each one of us has on an average some 7 percent more food than people a generation ago at the same age. (FAO, 1998) The increase in food production has however not come without environmental costs. The pressure on land and fresh water resources is increasing and the intensive use of farm inputs to produce more from same amount of land area is causing negative externalities at local and global levels. Ironically, food policies in developing countries in Central and South Asia, continue to be focused solely on increasing food production even in face of findings that political action will be needed to ensure that the poor have the means to buy food. (Sen, 1989)

Environmental problems, on the other hand, are increasingly proving to be a limiting factor for enhancing farm productivity, and ensuring provision of safe and healthy food. Local environmental problems such as contaminated or depleting groundwater, air-pollution, waste discharge; and global problems like desertification, and global warming are putting food production at risk. Developing countries are at an even greater risk because of their financial inability to cushion the impact of these problems. Weak, poorly-designed, and often conflicting policies are substantially responsible for this deplorable situation where food insecurity conditions get aggravated by building threat to the environment. India is one such country which needs to ensure that its environment and food policies complement each other.

India: Inter-relationship between food and environmental policies

Increasing food production has always been a key issue in the Five-Year Plans and Budgets drafted by Planning Commission of India since 1950. India was one of the first countries to set up a separate Ministry to look into environmental issues in 1972 itself. In spite of such systematic planning and good foresight, India has not drafted a comprehensive agriculture and food policy which looks into the impact of agriculture on environment and vice-versa. (Dhar, 1999). The Ministry of Agriculture is responsible for laying down policies relating to food production whereas the Ministry of Health establishes the safety standards for food consumption. The Ministry of Environment and Forests is the

policy-making body for all environment standards in the country. In absence of a bridging mechanism, there is often a conflict in the policies and standards designed by these different authorities.

Food Policies affecting the Environment

Over the years, food policies in India have largely focused on the production aspect of agriculture, and to a lesser extent towards its distribution due to its basic responsibility to ensure food security for the growing population. In the late sixties, India went in for Green Revolution to accelerate domestic food grain production by implementing policy measures which encouraged high external input agriculture, promoted the use of fertilisers and pesticides, and intensified support irrigation. There was a substantial increase in foodgrain production and India for the first time became a net foodgrain exporter but not without incurring huge environmental costs.

First order environmental problems, such as salinity ingress along coastal areas, water-logging and high soil alkalinity became noticeable within years of Green Revolution. The problems have intensified and in some regions the land productivity is actually diminishing, and farmers along the coastal regions are selling off their land for stone mining in absence of fresh water for cultivation. As a consequence, it is estimated that India may become once again become a net importer of food grains by 2025. (Swaminathan, 1999).

The intensification of agriculture has also catalysed macro-environmental problems such as global warming due to increased carbon emissions from agricultural fields. The subsequent paragraphs discuss some of the deviant food policies and how they lead to environmental problems. Figure 1. shows the causal flow of how Food Policies impact on the Environment in India.

Intensification and Expansion of Arable Land

The Green Revolution in India has spurred rapid intensification of agricultural activities in terms of increase in gross cropped area and decrease in time for which land is left fallow. (Economic Survey, 1997). Intensification diminishes biodiversity in agricultural areas by reducing the space allotted to hedgerows, wildlife corridors and by displacing traditional varieties of seeds with high-yielding, uniform crops. Further, the weak ownership rights pertaining to common property land, and the increasing pressure on land has led to expansion of agricultural activities into forest land and fragile ecosystems. Consequently, there is a loss of biodiversity as agricultural land supports far less biodiversity than the natural forests, and results in increase in soil run-off from these ecologically fragile areas as farmers invest little in soil conservation measures on encroached land. (Nath, 1998)

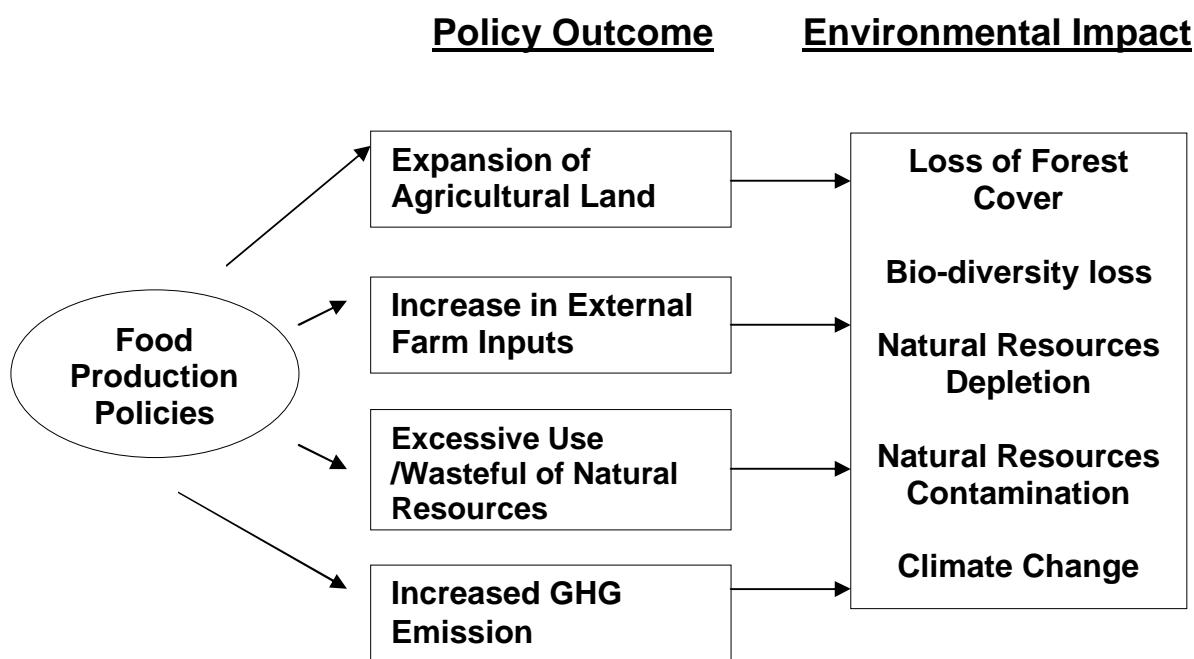


Figure 1: Causal Flow Diagram linking Food Policies to their impact on the Environment.

Farm Input Subsidies

Agriculture is a highly subsidised sector and input subsidies constitute a major share of budgetary outlay for agriculture each year. The subsidies are meant to enhance food production and benefit the small farmers. Nevertheless, these subsidies seldom reach the targeted users and is one of the main causes for environmental damages. The government provides a subsidy of Rs. 4400 (\$ 95) for every tonne of DAP fertiliser and an equally high subsidy weedicides. As a result, there has been an increase in the use of fertilisers and other chemicals on large farms, often leading to their excess and wasteful use. (FAO, 1998) Due to inadequate soil protection measures on such fields and incorrect applications of these inputs (because of lack of education and awareness), there is a large run-off of chemicals into the open wells and local water bodies. These chemicals very easily enter the food chain due to livestock-based farming practiced in India, and scientific evidence points to high percentage of pesticides such as DDT in consumption crops as well as in milk. (CSE, 1999). Some of the pesticides used by the farmers, namely the Roundup Pesticides, have a “scorching” effect on the ground and eliminate the propagation of other plant species in the neighbouring fields too.

In some areas, the untargeted subsidies have led to a shift in cropping pattern from food crops to factory farming and shrimp farming which offer a greater rate of return. In Kerala, only 26% of the agricultural area is under food crops and the rest is under plantation crops leading to accelerated natural resources degradation and local food security crisis (Nath, 1998). Shrimp farming is leading to the degradation of coastal ecosystems and rampant disease in wild and cultured stocks of shrimp. (Greenpeace 1997)

Water Pricing

Irrigation water is a public good in India the price of which has traditionally been set without regard to the full social and environmental costs associated with its use. Over-irrigation and wasteful irrigation are end-results of such pricing mechanism as farmers have little incentive to adopt water-conservation techniques. From an environmental perspective, this has reduced the capacity of agro-ecosystems to provide clean freshwater, and seasonal droughts and water-wars are becoming increasingly common. Nine Indian state are now running water-deficit and there is a problem of salinisation. The problem is particularly serious in Punjab and Haryana, India's principal breadbaskets. (WorldWatch 2000) where the long-term sustainability of the natural resource base has become uncertain.

GreenHouse Gas Emissions

At a macro-level, policies promoting monoculture cultivation like increasing area under rice farms, conversion of forested land for agricultural use, and the deliberate burning of crop-stubble for enhancing soil fertility could significantly increase agricultural emissions of methane and carbon dioxide. (WRI, USDA, 2000) These emissions are a major contributor of greenhouse gases in the atmosphere which lead to global warming and other climatic changes.

Environmental Policies affecting Food Production

Local and regional environmental policies have a direct impact on the local food supplies situation. The relationship is more significant for developing countries because of their high dependence on natural resources for food production, and their reduced ability to balance the fluctuation in yearly grain production (Nath 1998). Any change in the quality of local natural resources such as fresh water availability, soil fertility, loss of biodiversity etc. will have a direct influence on foodgrain production. The changes in global environment too has a deteriorating impact. Scientists predict that at current levels of global warming, India will witness an increase in the frequency of droughts and floods and make some regions unsuitable for agriculture. (UNFCCC, 1998) Some of the deviant environmental policies and how they impact food production in India are discussed below. Figure 2. shows the causal flow of how Environmental Policies impact food production in India.

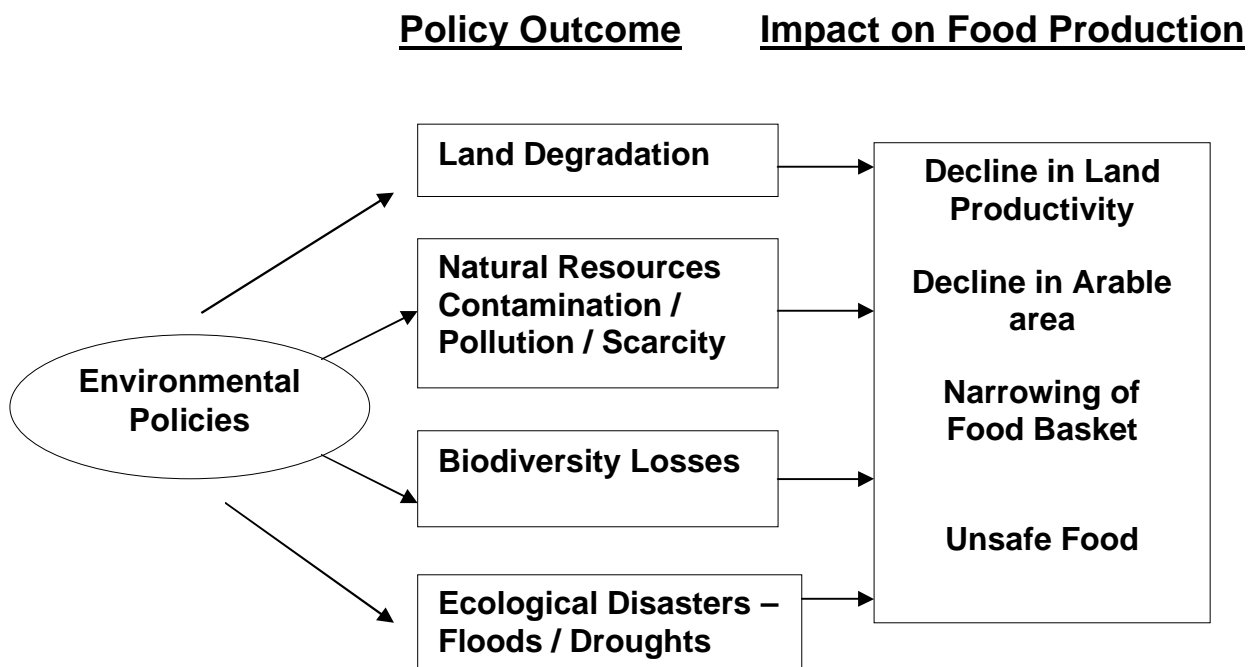


Figure 2: Causal Flow Diagram linking Environmental Policies to their impact on food production.

Effluents and Toxic Waste Discharge

The Ministry of Environment and Forests (India) has framed comprehensive pollution and waste management legislations to limit untreated discharge of effluents. (NEERI, 1995). However, differences in implementation of these legislations at the State level, imply that industries often continue to pollute the local environment without the awareness of people and local authorities. For example, southern Gujarat is the breeding ground of several small-scale chemical industries which are heavily polluting and are under little regulatory control to check pollution. The effluents from these industries are discharged directly into deep bores or into local water bodies. Consequently, trace of heavy metals find their way in the food chain as groundwater is heavily used for secondary irrigation. Many plants, including wheat, corn, and leafy vegetables grown in the area readily absorb cadmium and make a substantial contribution to cadmium intake by humans.

Further, main rivers in India such as Yamuna and Ganges now have pollution levels way above the permissible standards rendering their water unfit even for irrigation purposes in the downstream areas. The environmental policies governing the reduction the pollution levels in rivers are at best curative and relate to cleaning up of the rivers and maintaining a minimum level of dissolved biological oxygen (BOD) rather than preventive (CSE, 1998)

Inefficient and wasteful Technologies

The Green Rating Survey (1999) done by Centre for Science and Environment, on the paper and pulp industries in India indicated that none of the surveyed industries cleared the environmental standards laid down by the Government and all of them were using older technologies that were polluting and resource inefficient. The resource inefficiency of industries lead to negative externality on food grain production as they exploit the locally available natural resources leading to scarcity and contamination of irrigation water, high levels of air pollution, and problems of waste management. Cement-making industries, paper and pulp industries and thermal power stations in India are one of the most resource inefficient industries, and directly impact the quantity and quality of food grain production within their catchment area.

The current environmental policy regime in India does provide tax incentives and depreciation benefits to industries switching over to cleaner technologies but there is a lack of capital inflow, private investments and transfer of technology to catalyse these transformations.

Land Degradation

It is estimated that almost 64% of agricultural land in India is under some form of soil erosion. (Ganapathy, 1993) Activities such as open cast mining, construction of roads and highways, large-scale irrigation and dam projects lead to heavy loss of top-soil in the surrounding areas and aggravate land degradation conditions. In the north-eastern region of India, there are hundreds of wood sawing mills, and paper and pulp making Industries which proliferate due to abundance of natural resources, weak regulations and political nexus established by the industry owners. Consequently, the area is almost an ecological disaster- has one of the highest soil erosion rates, is prone to landslides and the industries have proved to be the bane of terrace farming practiced in the mountainous eco-zone. Environmental policies for ecologically fragile zones namely, mountainous areas and wetlands, have not been firmly established and therefore are unable to check their exploitation.

Biodiversity Loss

India is one of the 12 mega HotSpots of Biodiversity in the world but it is yet to pass the National Biodiversity law to provide greater protection to its rich biological resources. Much of the food production basket in India is now comprised of just five main crops, and there is a constant decline in food production from coarse cereals and other traditional varieties. (Ellis, 1998). The traditional varieties are much better suited to local climatic conditions and do not require use of high external inputs. This narrowing-off of biodiversity base on which the entire food production is based, poses a grave risk to food security conditions. Further, the splicing of plant genes to genetically engineer high-yielding crop varieties may lead to further decline in biodiversity and unpredictable scales of disaster. (Nath, 1998)

Environmental Clearances and Impact Assessment

Statutory environmental clearance under Environment (Protection) Act is required for Development Projects such as major irrigation schemes with command area of 10,000 hectares and more; and for

activities along the coastal zones. The Central Government also has made it mandatory to conduct Environmental Impact Assessment Studies for large-scale irrigation projects and setting up of industries in ecologically fragile areas. These studies however do not constitute the sole rationale for making a decision, and in absence of financial resources and expertise, are often not very comprehensive and suggestive to influence decision-making processes.

Further, there is a problem of optimal ignorance among policy makers and injudicious decisions are taken, not in the absence of enough information, but due to unwillingness of policy makers to act upon the available information.

Overcoming Contradictory Aspects

Policies with regards to safeguarding environment and enhancing food grain production are often in antithesis of each other as the link between agriculture and environment is not well- understood. Policy makers need to realise that to ensure sustainable development without damaging the natural resource base, the basic life support systems, namely, soil, water, flora, fauna and the environment need to be nurtured for enhancing agricultural production. The following paragraphs discuss some of the ways to address this issue.

Integrating Environmental Concerns in Agriculture Projects

Integrated watershed management policies offer a new perspective to look at environment-food production linkages. People living along the same watershed have similar socio-economic conditions (IIED 1995) and face similar environmental problems. (Nath 1996) Further, all food is produced within watersheds, and therefore most watershed groups recognize that the activities of every farm, homestead, business and facility in the watershed must be carefully analysed for potentially negative environmental impacts on the watershed in order to protect local resources. Most watersheds flow into ever larger bodies of water that flow into urban areas where they are used for recreation, drinking water and industrial water supplies. This creates the potential for bringing environmental concerns in designing agricultural projects. (USDA, 1999)

Public Investment Policies

The skew in public investment policies in Indian agriculture needs to be corrected for environmental gains. The policies advocate greater financial spending on large irrigation projects to increase the area under intensive agriculture. This has led to large-scale environmental problems and disasters in terms of submergence of forest land, loss of bio-diversity, increase in pollution in urban areas due to rapid migration etc. Focus needs to be shifted to medium and small irrigation projects which offer almost the same potential for bringing increased area under irrigation but lead to lesser environmental damage and more equitable distribution of end-benefits.

Subsidies provided to food production sector should be made more targeted to reduce wasteful depletion of natural resources. The negligible cost of rural electricity leads to over-irrigation of fields

through electric motors at the cost of the environment, and yet these subsidies do not reach the poor farmers as they do not own private wells or electric motors. Policies therefore need to focus on providing greater subsidies to public irrigation schemes such as lift irrigation and small canal irrigation which are based on the principle of in-situ conservation of resources, optimal and equitable use and social fencing.

Creating Symbiotic Linkages

Government need to formulate policies that provide financial incentives and technological assistance for creating symbiotic linkages between environment protection and enhancing foodgrain production. Industrial activities such as cement manufacturing, chemical and steel production generate wastes that contain lead, mercury, cadmium, arsenic and other pollutants. Since these wastes also contain lime, calcium, phosphorus, zinc or other minerals beneficial to agriculture, government agencies need to encourage the "recycling" of these wastes into fertilizers.

Further, as expansion of farm areas face mounting environmental constraints, improvements will have to come through better soil-water conservation for raising productivity. State-level agricultural policies need to focus on encouraging farmers to invest in rainwater harvesting structures, and adopt soil conservation techniques such as terracing and bunding to promote in-situ environmental protection measures. Involving research and training institutions in educating farmers on agro-forestry models, synergistic intercropping, and breeding more salt tolerant and drought resistant crops like *sapote* and varieties of fox-millet could boost total foodgrain without acting detrimental to the local environment.

Use of Precautionary Principle

The local, state and national environmental regulators need to apply the Precautionary Principle when they seek to determine the potential risks posed by heavily polluting industries being set up close to agricultural areas. Accidental discharge of toxic waste into agricultural fields could put the entire food chain at risk as was the case of Minamata Mercury tragedy in Japan in the 50s. This principle also needs to be applied when introducing little tested out technologies and products such as genetically modified seeds and pesticides which could enhance agricultural productivity in short-term but could put the local environment at grave risk in the longer term.

Empowering Local Governance Institutions

The absence of informed and responsive civil society at all levels is often the reason for non-compliance of environmental policies. There is a need to revisit the principal of subsidiarity which was raised at UNCED in 1992, and advocated shifting of powers and responsibility for maintaining the environmental agenda to the local administrative units. Panchyati Raj Institutions (PRIs) in India need to be empowered and vested with greater political powers so that they play an influential role in micro-planning activities to ensure that local food security and environment are not put at a risk. This could also be one of the pre-emptive strategy to cope up with yield fluctuations that are likely to arise in view of global changes in climatic conditions.

Conclusion

Effective policy regime through institutional strengthening is the principal requirement for better integration of environmental and food security concerns. At the macro-level, the functions of the agricultural and environmental ministries with regulatory and development mandates need to be well coordinated. While at the micro-level, extension and training, and informed participation of resource users and other stakeholders, followed by greater delegation of authoring seems to be the way forward to maintain the dynamic balance between environment protection and sustained food production.

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