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Climate Change Environmental Degradation and Common Property Resource Management

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ABSTRACT

Common property resources, particularly forests and pastures are rapidly decreasing and deteriorating in developing countries like Nepal resulting in many unintended and unanticipated environmental problems. For many, a particularly neoclassical economist, population growth resulting in poverty has exerted pressure on common resources thereby creating what is known asthe tragedy of the commons (Hardin 1968). They argue that because of growing populationpressure, resources held in common are subject to destruction as an individual maximizes individual gains without bearing the costs.The existing problems of poor farmers, if not addressed in time, will become more acute due to global warming induced climate change. The prediction sofa suggests an upward trend in mean monthly temperature and average rainfall.However, the prediction indicates downward trend in the number of wet daysin a year. The impact of climate change would be seen in terms of increasedsub-regional variations and more extreme rain events. In a country that gets rainfor less than 100 hours in a year (a year has 8,760 hours), this would be disastrous.The rate of CO2 release into the atmosphere has increased by 30 times in the lastthree-four decades. It is estimated that a 0.5 degree Celsius rise in winter temperaturewould reduce wheat yield by 0.45 tons per hectare. A recent World Bank reportstudied two drought prone regions in Andhra Pradesh and Maharashtra and oneflood prone region in Orissa on climate change impacts. It found that climatechange could have the following serious impacts. In this perspective, the environmental problems of rural areas have received more attention than those of the urban areas. There is little realization of the deterioration of the rural environment which can spell danger to the major segment of the country's population.

Capitalist and Socialist Models of Common Property Resource Management

There are two dominant conceptual models of common property resource management: acapitalist model and a socialist model. The capitalist model argues that resources that are heldcommonly are subject to degradation. Hence, privatization of public resources is the only viablesolution to the problem. The socialist model explains that economic poverty caused by inequitable distribution of resources among rural agrarian population is the driving force of resource destruction. Therefore, collectivization or nationalization of public resources serves as an equitable strategy of resource management. A third model suggested by social scientists,particularly anthropologists, asserts the multiplicity of economic, historical, political, and socialdynamics at play in resource degradation. These dynamics have disrupted the local control systemwhich otherwise would serve as effective means of common property resource management.They suggest that the policy makers should recognize, support, and strengthen cultural system and socio-political institutions of local people rather than replacing them with other forms of management strategy, for traditional customs and usages practiced by local people have several positive effects in managing and sustaining common property resources and promoting socioeconomic development.

Common property resources, particularly forests and pastures are rapidly decreasing and deteriorating in developing countries like Nepal resulting in many unintended and unanticipated environmental problems. For many, a particularly neoclassical economist, population growth resulting in poverty has exerted pressure on common resources thereby creating what is known asthe tragedy of the commons (Hardin 1968). They argue that because of growing populationpressure, resources held in common are subject to destruction as an individual maximizesindividual gains without bearing the costs. They suggest that the proper solution of the overexploitationof common resources, therefore, is to internalize its costs by making the public aspect of resources private (Runge 1985). With the private property, an individual maximizewill rationally manage resources at its best and highest use and thus remain competitive within the market. They further assume that markets are always best means of allocating public resources and that competition necessarily leads to appropriate management (Vernon 1988).

The concept of Property rights has an important implication to the use of natural resources, degradation and conservations. Bromley (1990) describes property, not as a natural resource but as a benefit stream that arises from that resource. With property, comes the right to use or access,

which can be defined as one's claim to a benefit stream

The socialist model does not accept the population as the principal cause of the tragedy of thecommons. It analyzes the increasing rate of population in historical and more socially complex manner than simply invoking aggregate population parameters. For instance, family size reflects rational economic decisions. The cost-benefits ratio of extra-children is high for poor families inpoor societies or societies where resources are inequitably distributed, because children contributeeconomically in agriculture labor or the informal economy of the household at an early age andcontinue to do so throughout their lives (Hecht 1985). Several community studies from differentparts of the world substantiate the assertion of the attribution of high economic values of childrenin subsistence economies. The socialist model admits that the environmental problems have their∗Dr. Gurung is a Reader in Anthropology at the Central Department of Sociology/Anthropology, T. U.

Climate Changes India A Solution To The Problem or A Problem To The Solution?

Debate on multilateral action on climate change between the developed anddeveloping countries has been sharply polarized for a long-time. India has been in theeye of this storm since 1980s when this debate started. This is because India forcefully, and rightfully, made development and poverty eradication key issues within the climate change negotiation. India doesn't buy the argument of the developed countries that the concern for the planet's present climate must supersede the historical guilt of the formers as the major polluters or that the developing countries should adjust their growth prospect inconsideration of climate change mitigation. There are many myths being made of India's stands in the context of climate change negotiation and discussions. We need to dispel them.

India's Development Challenges

India, one of the fastest economies of the world, faces the challenge of making available the energy needed to fuel this impressive economic growth. Of India's more than one billion population1 , more than 800 million people (79.9 percent ofthe population) still subsist on less than US $ 2 per day. More than 700 million people still cook on traditional cook stoves using crop waste and animal residue. More than 400 million people still don't have access to electricity.India stands at 128th position in the World Human Development Index. No country in history has improved its level of human development without corresponding increase in per capita use of energy *(see Graph 1: An international comparisonbetween Human Development Index and per-capita energy consumption)*. To expectIndia not to do so would be unrealistic.

Fact:

Over several decades India has pursued policies and publicly funded programsfocused on energy conservation and deployment of renewable energy technologies.This has been backed by legislation, regulation and tariffs arrangements. Some ofthese are:

a) Reforming Energy Markets (Electricity Act 2005, Tariff Policy 2003, Petroleum &Natural Gas Regulatory Board Act, 2006, etc.) involving:

• Removal of entry barriers in exploration, extraction, conversion, transmissionand distribution of primary and secondary energy.

• Instituting price reform and tax reforms to promote optimal fuel choices.• Providing feed in tariffs for renewable energy like solar, wind and biomass.• Strengthening or introducingindependent regulation.

b) New and Renewable Energy Policy, 2005: The policy promotes adoption ofsustainable and renewable energy sources. It facilitates speedy deploymentof renewable technology through indigenous design, development andmanufacturing.

c) Rural Electrification Policy, 2006: The policy promotes renewable energytechnologies where grid connectivity is not possible or cost-effective.

d) Biodiesel Purchase Policy: It mandates biodiesel procurement by petroleumcompanies.

e) Ethanol Blending of Gasoline: The regulation mandates fivepercent blending of ethanol with gasoline from 1January2003 in nine states and four Union Territories.

f) Energy Conservation Act, 2001: The legislation aims to reducespecific energy consumption in different sectors. It set up the specialized Bureau of Energy Efficiency (BEE).

Climate Change and Food Security inIndia

Knowledge about the impact of climate change on current water and crop production is limited. At the same time mitigating and bringing a halt to climate change is not within the capability of one country alone. Thus adaptation strategies seem to be themost immediate needs to save livelihoods and ensure food security.India has to maintain the sustainability of its ecosystems to meet the food and non-food needs of a growing population. The mainthrust of the programmers to combat the impact of climate change on food security should be on activities relating to rainwater harvesting and soil conservation.

A Deep Crisis

Despite fast economic growth and piling food stocks in the government god owns,India is home to the largest number of hungry and deprived people in the world –to be precise 360 million undernourished and 300 million poor people. Sustainingsupply of food itself is emerging as a

critical issue. Growth in foodgrabin productionis slow, rather decreasing over the last few decades. During 1996-2008 it increasedby just 1.2 percent per annum: from 199 to 230 million tons (mT), as against an annual rate of growth of 3.5 percent achieved during the 1980s.On top of it, the poor lack purchasing power. This led to artificial surpluses infoodgrain stock and enabled government to export an average of about seven tmfoodgrains annually during 2002-08. The net food grain availability has declinedfrom 510 grams per day per capita in 1991 to 443 grams in 2007. It affects the poorthe most as they have little access to the more expensive fruits, vegetables, poultry,and meat products. They need food but don't have purchasing power. This situationis more pronounced in central and eastern India.

The policy approach to agriculture since 1990s has been to secure increasedproduction through subsidies on inputs such as power, water and fertilizer andby increasing the minimum support price (MSP) rather than through buildingnew capital assets in surface irrigation, power and rural infrastructure or throughimproving credit for small farmers and evolving new drought resistant technologies.This has shifted the production base from low-cost regions to high-cost ones,causing an increase in the cost of production, regional imbalance and an increasein the burden of storage and transport of foodgrains.

The equity, efficiency and sustainability of the current approach are questionable.Subsidies do not improve income distribution or the demand for labor. The boostin output from subsidy-stimulated use of fertilizer, pesticides and water has thepotential to damage aquifers and soils – an environmentally unsustainable approachthat may partly explain the rising costs and slowing growth and productivity inagriculture, notably in Punjab and Haryana states. Although private investment inagriculture has increased, this has often involved macro-economic inefficiencies(such as private investment indiesel generating sets instead of public investment in electricity supply).

Public investment in agriculture has fallen dramatically since 1980s. This coincides with declining share of agriculture in the total gross capital formation (GCF). Insteadof promoting low-cost labor intensive options that have a higher capital-outputratio, present policies have resulted in excessive use of capital on the farms such astoo many tubewells in water-scarce regions.Another big change in the last three decades is the dominant use of groundwater as opposed to surface and sub-soil (through shallow wells). Groundwater hasbecome the main source of irrigation. Surface irrigation systems already createdare lying wasted because canals or other systems are hardly maintained. Becauseof inefficiency of large water irrigation systems, people have been forced to exploitgroundwater. Thus bulk of Indian agriculture not only remains rained but also depends on groundwater, not surface water. This is worrisome in the current context of increasingly variable rainfall.

Due to excessive withdrawal of groundwater, groundwater use exceeds the rateof groundwater recharge. As a result Government has classified nearly 30 percentof the development blocks in the country as semi-critical, critical or overexploited(mostly in 'green revolution' areas) in term of groundwater depletion. As there isno effective control over digging of tubewells in water-scarce regions, farmers areborrowing money from informal sources at high interest rates for it. Many such borings fail due to non-availability of groundwater leading to indebtedness, andeven suicides.Since sinking a bore well involves heavy upfront investment, only the affluentfarmers go for it. Small farmers continue to depend on the shallow dug well that hasbeen in existence for decades. Bore wells drain much larger quantities of water andit is usually from the same aquifers that feed the dug wells. So in a village the small farmer is adversely affected due to water withdrawal by richer farmers. The affluentfarmers, owning bore wells and electric motors, corner most ofthe benefits of electricity subsidy too. Ironically, they in turn selltheir surplus water to the adjacent small farmers at commercial rates. The built-in biases of the Green Revolution strategy nowstand exposed.

Climate Change, A Crisis Catalyst

The existing problems of poor farmers, if not addressed in time, will become more acute due to global warming induced climate change. The prediction sofa suggests an upward trend in mean monthly temperature and average rainfall.However, the prediction indicates downward trend in the number of wet daysin a year. The impact of climate change would be seen in terms of increasedsub-regional variations and more extreme rain events. In a country that gets rainfor less than 100 hours in a year (a year has 8,760 hours), this would be disastrous.The rate of CO_2 release into the atmosphere has increased by 30 times in the lastthree-four decades. It is estimated that a 0.5 degree Celsius rise in winter temperaturewould reduce wheat yield by 0.45 tons per hectare. A recent World Bank reportstudied two drought prone regions in Andhra Pradesh and Maharashtra and oneflood prone region in Orissa on climate change impacts. It found that climatechange could have the following serious impacts:

Other effects of climate change are more pronounced. For instance, rise in sealevels, say about a meter by the next century, may displace millions of people. Sealevel rise would lead to ingress of saline water and salivation of ground water andsurface water in coastal areas. Salt water intrusion in low-lying agricultural plainscould lead to food insecurity, further spread of water-related diseases and reducedfreshwater supplies.With melting glaciers, flood risks would increase in the near future. In the long term,there can be no replacement for the water provided by glaciers that could result inwater shortages on an unparalleled scale. Floods and drought are thus projected tomultiply as a consequence of climate change. This will lead to huge crop loss andleave large patches of arable land unfit for cultivation. To sum up it will threatenfood security.

Environmental Degradation In India:

Environmental degradation is the disintegration of the earth or deterioration of the environment through consumption of assets, like, air, water and soil. The destruction of environments and the eradication of wildlife. Air pollution, water pollution, garbage, and pollution of the natural environment are all challenges for India. According to World Bank experts, between 1995 through 2010, India has made one of the fastest progresses in the world, in addressing its environmental issues and improving its environmental quality. Still, India has a long way to go to reach environmental quality similar to those enjoyed in developed economies. Pollution remains a major challenge and opportunity for India. Environmental degradation is one of the primary causes of diseases, health issues and long term livelihood impact for India.

The sustainable management of the environment and natural resources is vital for economic growth and human wellbeing. When managed well, renewable natural resources, watersheds, productive landscapes and seascapes can provide the foundation for sustained inclusive growth, food security and poverty reduction. Natural resources provide livelihoods for hundreds of millions of people and generate sizeable tax revenue. The world's ecosystems regulate the air, water and soil on which we all depend. They form a unique and cost-effective buffer against extreme weather events and climate change.Healthy ecosystems are essential for the long-term growth of economic sectors such as agriculture, forestry, fisheries and tourism. They already provide hundreds of millions of jobs.

In developing countries, forests, lakes, rivers and oceans provide a significant share of households' diets, fuel and incomes and represent a precious safety net in times of crisis particularly for 78 per cent of the world's extreme poor who live in rural areas.The integrity and functionality of these vital natural assets, however, are increasingly compromised. 60 to 70 per cent of the world's ecosystems are degrading faster than they can recover.

There are many environmental issues in India. Air pollution, water pollution, garbage, and pollution of the natural environment are all challenges for India. The situation was worse between 1947 through 1995. According to data collection and environment assessment studies of World Bank experts, between 1995 through 2010, India has made one of the fastest progress in the world in addressing its environmental issues and improving its environmental quality. Still, India has a long way to go to reach environmental quality similar to those enjoyed in developed economies. Pollution remains a major challenge and opportunity for India. Environmental issues are one of the primary causes of disease, health issues and long term livelihood impact for India.

Causes of Environmental Degradation

The major causes of the environmental degradation are modern urbanization, industrialization, over-population growth, deforestation etc. Environmental pollution refers to the degradation of quality and quantity of natural resources. Different kinds of the human activities are the main reasons of environmental degradation. These*Environmental Degradation in India: Causes and Consequences* 1595 have led to environment changes that have become harmful to all living beings. The smoke emitted by the vehicles and factories increases the amount of poisonous gases in the air. The waste products, smoke emitted by vehicles and industries are the main causes of pollution. Unplanned urbanization and industrialization have caused water, air and sound pollution. Urbanization and industrialization help to increase pollution of the sources of water. Similarly, the smoke emitted by vehicles and industries like Chlorofluorocarbon, nitrogen oxide, carbon monoxide and other dust particles pollute air. Poverty still remains a problem at the root of several environmental problems.

SOCIAL FACTORS

Population

The rapid population growth and economic development in country are degrading the environment through the uncontrolled growth of urbanization and industrialization, expansion and intensification of agriculture and the destruction of natural habitats. One of the major causes of environmental degradation in India could be attributed to rapid growth of population which is adversely affecting the natural resources and environment. The growing population and the environmental deterioration face the challenge of sustained development without environmental damage. The existence or the absence of favorable natural resources can facilitate or retard the process of economic development.

Population is an important source of development, yet it is a major source of environmental degradation when it exceeds the thresh hold limits of the support systems. Unless the relationship between the multiplying population and the life support system can be stabilized, development programmers, howsoever, innovative are not likely to yield desired results. Population impacts on the environment primarily through the use of natural resources and production of wastes and is associated with environmental stresses like loss of biodiversity, air and water pollution and increased pressure on arable land.

The increase in population has been due to the improvement in health conditions and control of diseases. The density of population has gone up from 117 in 1951 to 312 in 2001 and further to 382 persons in 2011 per square kilometer. Several push and pull factors are presumed to be operative towards distress out migration from rural to urban areas. This might be due to the declining resource availability per capita and shrinking economic

opportunities in rural areas and better economic opportunities, health and educational facilities etc. in urban areas providing opportunities for higher level of human capital development could be the underlying factors for rural out migration.India supports 17 per cent of the world population on just 2.4 per cent of world land area.

Effectiveness of Common Property Resource Management

Common property resource management involves costs and benefits. The cost benefits affectresource management. They vary according to the temporal, spatial, tangibility, and distributiondimensions. The local institutions will be most effective in management if the benefits ofResource management accrue quickly, locally, visibly, and individually or collectively. Theopposite is true if the benefits are delayed, remote, hard to identify and do not accrue to theinvestors of efforts.The management of the natural resources also depends upon the characteristics of resources. Theless renewable a resource is the more risk there is that poor management will have drastic consequences, and the more reason one can offer for some form of government involvement.Seasonality is another factor of great importance for resource management. Examples fromBotswana, Philippines, Indonesia, and Nepal suggest that the flow of local institutional activity isgenerally affected by variations in the agricultural season. During wet season, water is abundant and it needs less co-operative efforts for water management and maintenance. As a result, local institutions are less active and united for its management. During the dry seasons, water is scarce, local user groups cannot work effectively and central government's intervention is almost inevitable. Similarly, during the rainy season fodders are abundant in private lands and forest resources need less management attention, while fodders are scarce during the winter resulting inefficient management and distribution of fodder trees among the communities (Acharya 1990).More importantly, property arrangement is an effective mechanism of resource management.There are numerous examples of communities who preferred to keep and use common propertyresources jointly. For example, the Rais, Limbu, Sherpa.Chepang, Lapcha, Majhis, Tamangs,Sunuwar, and Danuwar communities of Nepal owned and controlled their natural resources, suchas forests and lands jointly and they are distributed in accordance with the family requirements(Regmi, 1971). Because the domestic units held individual rights to use resources not ownership,resource alienation was impossible. This system of property rights protected natural resourcesfrom fragmentation resulting in degradation.

More or the less similar practice of property arrangement is reported by Acharya (1990) fromtheJiri communities of Nepal. According to him.Jirel own natural resources in different wayssuchas joint ownership and cooperative ownership. Their property rights depend upon the localperception of resources. Their cognitive categorization of resources, such as ground, fodder tress, on-fodder trees, renewable and non-renewable resources have made them easier to partition forest resources. According to this arrangement, several people own different kinds of resources within the same forest areas. Thus, the ground/lands are owned jointly, but trees are owned individually by number, species, age, and size. Each individual family gets a share of forest resources. Those who do not own animals or graze lesser animals than others receive their proportional share of pasture rent from those who graze animals. Those who do not have ownership rights of forest resources due to non-providing communal obligations or matrilineal inheritance problems or late migration in the village enjoy usufruct rights. Despite existing inequalities in ownership rights, the usufruct rights help Jiri households meet the needs of fodders and fuel-woods. It has also protected and redistributed resources in the community.

Implications of Common Property Resource Management

Common property arrangements have many social and economic implications. First, it has guaranteed the continuous supplies of natural resources that are essential for subsistence economyof rural people. Second, it has constituted a mechanism of social control to protect commonresource. Individual exploitation is kept in check and local resources are protected fromdestruction by individual beneficiaries. It is not only equitable but is based upon a number ofconsiderations, such as family needs, communal responsibility, respect and welfare (Shrestha1990).

Under this common property arrangement, each individual family can meet their basic needs of timbers, fodders and fuel-woods without destroying or degenerating their resource bases.Joint ownership provides checks and balances to prevent over harvestings by illegal means, suchas stealing. It also provides incentives and motivates people to protect their forest resources.Common property arrangement contributes directly to the profitability and sustainability of bothagricultural and non-agricultural enterprises. Poor management can have detrimentalconsequences for rural infrastructure of economic development and health (Up off 1986).Common property arrangement has policy implications as well. The diversified and differentiatedproperty arrangements practiced by the local people have several positive effects in managing theuse patterns- availability, distribution, and conflicts associated with forest and pasture resourcesand should be supported and strengthened rather than replaced with a monolithic or exclusively private system of ownership (Acharya 1990). Local system of management should be identified and recognized by the policy makers and planners for the effective and equitable resource management. Local systems of resource management are effective, enduring and productive.

They are locally preferred approaches and therefore they should be supported and strengthened.The blueprint approach cannot fit into complex local situations. Planners and policy makersshould appreciate the social reality. This is what a social scientist can tell planners and policymakers about the management and maintenance of common property resources.

Conclusion

To conclude, privatization cannot avert the problems of resource management. People havealready experienced effects of privatization of public resources both in developing as well asdeveloped countries. Privatization is not a money plant that could be transplanted anywhere else.International Organizations, such the World Bank and IMF believe that privatization workeffectively to advance the economic growth of developing countries. But in everyday experience,privatization has not been working quite successfully even in the most competitive societies ofAmerica and West Europe. Under no circumstances, privatization is advisable for developingcountries where there are different social, economic, historical, political, and institutional backgrounds.

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