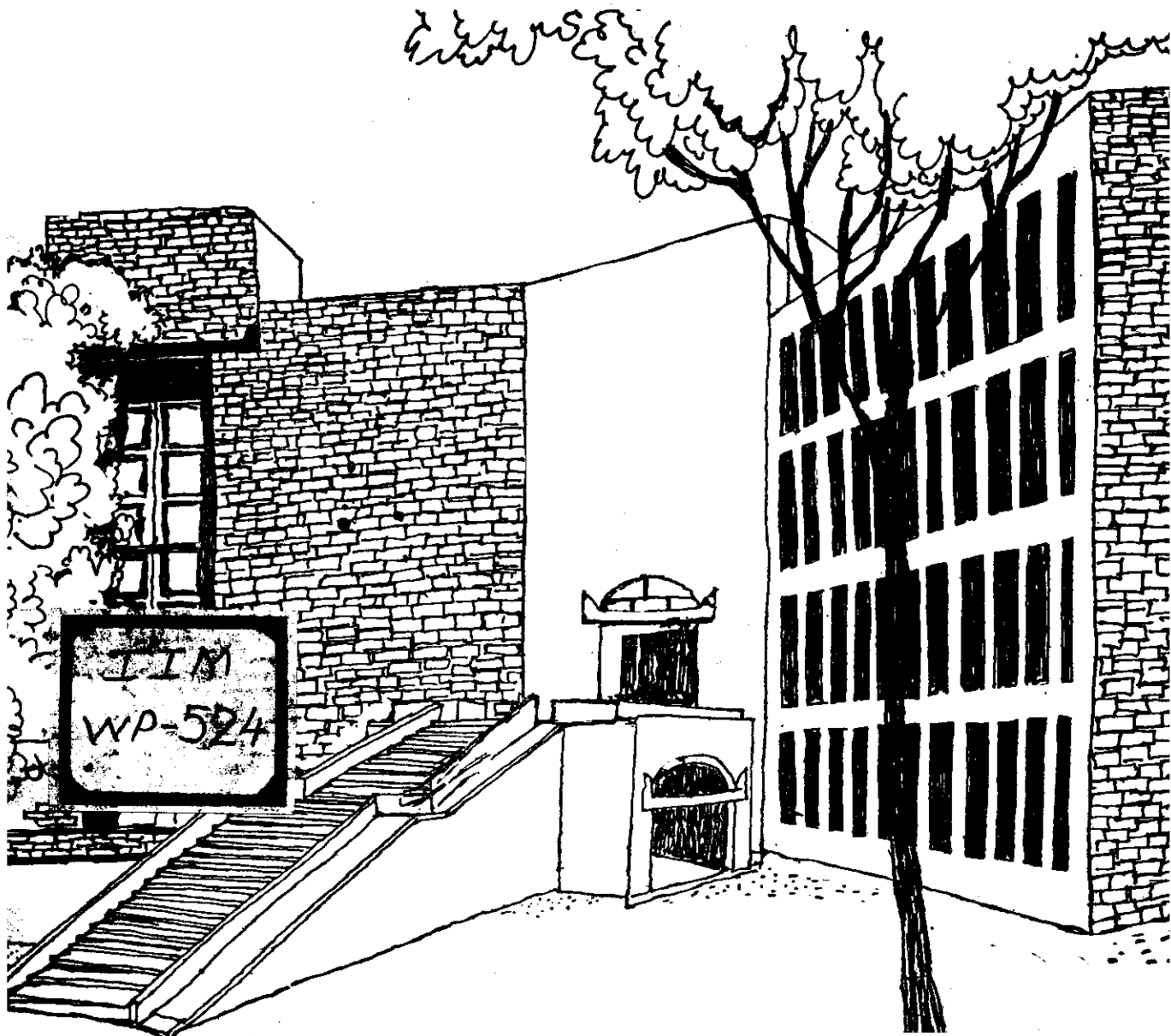


Working Paper



**SOCIO-ECOLOGY OF GRAZING LAND MANAGEMENT:
INVENTORY OF ISSUES**

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Socio-Ecology of Grazing Land Management

: Inventory of issues

Anil K. Gupta

Often the technological solutions to problems arising out of low productivity of grazing lands in arid and semi-arid regions are searched in a very narrow framework. Different classes of users ranging from landless livestockmen to landed livestockmen are considered equally vulnerable in the event of fodder crisis. The result is that either equal stakes are assumed of each class in conservation strategies or that policies like privatization or closure of common grazing land are suggested (which affect the landless most adversely in the short as well as long term) without simultaneously organizing water and fodder distribution network or alternative employment opportunities for these classes.

Frequent droughts in these regions have impaired the ability of small farmers and agricultural labourers to adjust with the lean seasons through livestock management. Often the poor are considered the culprit and responsible for environmental degradation. The Public policies for wasteland development have tended to worsen the accessibility to pasture lands. Technologists have not viewed the role of grazers as livestockmen-cum-cultivator-cum-craftsmen and labourers. This paper makes a forceful plea for adopting an socio-ecological approach to the problems of grazing land management in semi-arid and arid regions if prospects of largescale social tensions in a none too distant future are to be avoided.

Introduction

Ecological conditions define the mix of economic enterprises sustainable in any given region. The scale at which different classes of farmers operate however is a function of the access farmers have to different institutions, technologies, and resources necessary to use technologies. Due to frequent droughts, household budget of most of the marginal farmers and labourers is in deficit leading to indebtedness. The interpenetrating credit, product, and labour markets make it imperative that decision making options of farmer in any one resource market are not worked out independent of constraints and opportunities obtaining in other markets (Gupta, 1981). Technological interventions having bearing on improved income opportunity for different classes of farmers thus have to be appraised in the framework. Access differential is not a concept to be used only at the implementation or technology transfer stage. The way a technology is conceptualized determines in what ecological conditions who will benefit and how.

Conceptual Framework

We will present below the scheme of analysis in which the introductory statement can be appreciated.

Few issues which arise while exploring technological options for rangeland management are listed below:

(1) With whom in mind do we want to explore technological options?

How do we characterize the resource-use constraints of various classes of differentiated users of rangelands?

- (2) In what time-frame do we want to appraise the results of our interventions? If the tangible results follow much long after by when, in the absence of alternatives poor users would not agree to restricted access, how do we resolve the dilemma? In what time frame different classes of users appraise their own investment options in land, labour, credit and product markets? Are then 'timeframes' same in different markets and for various classes of farmers?
- (3) At whose cost improvement is planned? How much stake (financial and otherwise) central, state, and district administrations have in the programme besides, of course, various user classes? Are local governments participating in the programme merely because central assistance is available or are they genuinely committed to the project?
- (4) Whose skills in what proportion would be required for the development of range economy? Can we concentrate only on productivity of land? If so, how do we measure productivity in terms of various outputs and their end uses? What weightage do we assign to the utility of range lands as provider of fodder, fuel, raw material for crafts (e.g. some grasses are used for the purposes of making rope, trinkets etc.), tanning material for leather

based crafts, fibre (Agave is a very useful source of fibre) etc? Since different classes of users are endowed with different types of skills evolved historically in a give eco-context, one could neglect this dimension only at a great cost to the poor.

- (5) Finally what level of risk is anticipated by the technologists operating in the household resource use strategies of different classes of users? The role of risk has to be taken into account at several stages. What is the risk inherent in traditional risk adjustment devices of pastoralists; whether this level of risk has reduced or increased by the new intervention; whether there is a mismatch between multi-market simultaneous operations of poor households and single market technological intervention. For instance, seasonal peaks and troughs in labour use, income profile, and resource use might be managed by various household members by shifting several economic enterprises. The modern technological interventions, often by emphasizing only one or a few dimension of resource use, impair the resource shuffling ability of households increasing thereby their risk.

The concept of access differential which operates in any technological transition can thus be understood as given. We have shown how various mean-variance conditions of household enterprise mix influence on one hand the access of pastoralist to various markets and institutions, and influence the perception of the risk in environment. The poor

could visualize the same events as more risky if they had incurred debts in past.

Consequently stability or instability in cashflows would influence future outcomes which in turn would generate different stakes in environmental protection amongst surplus and deficit budget households.

Dimensions of problems

In recent past the issues of access to grazing land has been causing lot of stress to poor pastoralists. We mention below some of the dimensions of these tensions so that we can appreciate how a socio-ecological framework will help us look for different type of technological options.

A. Historical Perspective:

In the late sixties, a confidential report of the Ministry of Home Affairs had traced the roots of widespread violence to the widening of disparities owing to introduction of new technologies ('green revolution') in the already better endowed irrigated regions. Subsequently, various special area and target group programmes were introduced to blunt the edges of emerging contradictions. Drought prone area programme introduced in the mid-seventies to restore ecological balance, provide employment opportunities to poor besides attempting to drought proof the chronically affected regions apportioned

majority of the budget for minor irrigation (more than 50%) and infrastructural development like chilling plants for milk. Pasture development or soil conservation received extremely meagre support.

B. Instances of Violence:

Recent evidence of violence by dominant high caste landlords against landless livestock owners in Haryana, Bihar, Tamil Nadu has somehow not received sufficient public attention. Closure of forest for wild life protection in Bharatpur (Rajasthan) and Mehboobnagar (Andhra Pradesh) has led to dispute between herdsmen and forest officials. Increased vulnerability of shepherds due to reduced grazing facilities in some areas had led to long distance migration. Such migrants being politically weak have been subjected to exploitation by forest officials (e.g., Dahinela, M.P. where sheep worth Rs.1.0 lakh were killed by rangers owing to some disputes). However, these instances of violence have some deeper structural features of fodder crisis enumerated below.

1. Prices of Dry Fodder

Introduction of dwarf varieties have localized the fodder reserves; in some cases the total fodder supply has gone down. Dry fodder prices in a drought year (1979-80) in the pre-wheat harvest period were as high as Rs.90 - 120/- US \$ 10-15 approx.) per quintal. Inter-village differences in prices were very high pointing to high market imperfections.

2. Livestock disposal due to drought:

Data on livestock disposal from Haryana* reveal the following features.

- a) Between 1978, 1979, and 1980, maximum disposal took place in drought year 1979. In 1979, 40% animals disposed were buffaloes followed by bullocks, goat, camel and cow. Sheep disposal was maximum in better rainfall year - 1982.
- b) Among different reasons reported for disposal of buffaloes, the most important were fodder stress, followed by domestic consumption deficit, repayment of informal loans, sickness of animals etc., fodder, infirmity in case of bullocks; consumption deficit, reduced income in case of goat and fodder stress besides other reasons in cases of camel disposal were important reasons informed by farmers.
- c) Most of the disposal (80%) were by small, marginal farmers and landless labourers.
- d) Sheep and goat were predominantly owned by poorer marginal farmers (owning land less than 1 hectare) and small farmers (1-2 hectare landholding) owned majority of the other animals.
- e) Implications of disposal pattern are that fodder stress apart from urgent domestic consumption requirements, aggravated in drought year, forced majority of medium and small farmers to

* These findings are based on a CMA project on Small Farmer Household Economy in Semi-arid Regions.

dispose off heavy grazers (buffaloes, camels, cows) leading to greater reliance placed on closed grazers (goats, sheep) as the source of livelihood. Already poor grass cover had to be grazed upon more closely in drought years by poorer farmers besides others unless the cover was so little that they had to migrate out.

- f) Generally, the close grazers were also owned by lower caste medium and small farmers situated in more marginal areas.

A very strong tendency has been noted in institutional resources like credit to flow where whatever was already there. Credit did neither climb up the hills, nor traverse sand dunes, arid and marginal regions having majority of sheep, camels and goat (Gupta 1981, 1984).

Problems in grazing land management:

: Political Economy of access differential-

1. Village common lands traditionally available to landless and other poor hardsmen were auctioned by Panchayats dominated by high caste big landlords to highest bidders for cultivation. The poor livestock owners got excluded despite statutory reservation of some proportion for harijans. However, bigger farmers always found proxy harijans willing to be used as pawns.
2. Lessors of land insisted on sharing even the grass collected during weeding besides grains and fodder with tenants.

3. 'Auran' lands traditionally left unexploited in the name of village diety (got and goddesses) were being encroched upon by the farmers who remained behind when the poorer ones migrated away. Earlier weed from such lands were never cut and twigs of dead tree were used for funeral pyre of those whose kith and kin could not afford to buy wood. These lands acted earlier as ecological buffer.
4. Even the fallow lands were not allowed to be grazed upon by landlords who used the privilege of grazing as a means of patronage in return of vote for them in elections.
5. Generally, depressions on both the sides of the road in desert regions were low lying and thus had better grass cover. Long stretches of fencing such stips along the road without even providing frequent crossways made grazing difficult.
6. Large scale plantation of Hawain Giant (which required water in the initial stages and thus could be grown only where some water was available) had created a false hope for pastoralist. The leaves of these trees not only had to be cut but also mixed with some other fodder so as to make it palatable for cattle. Such a technology increased the dependence of marginal farmers and labourers on irrigated landed farmers.
7. Several wild grasses (e.g., moonj) and plants like agave have been used for rope making by old and women members of migrant

families left behind. Agave processing almost without exception was done by low caste people. However, technologies which could improve cultivation of agave and its processing did not attract national research resources in our country.

8. In some places, as a part of drought prone areas development programme, 100 hectare sheep and pasture development plots were established on cooperative basis on village common lands. As an intervention for restoration of ecological balance, this effort was quite effective. However, the consequent social tensions have not been given adequate attention (Gupta, 1981). The problems were:

- a) The lands which were allocated for closure and pasture development were not the type VI or VII, i.e., most degraded ones. To show results faster, better lands were chosen.
- b) The site of these plots was close to the village obstructing the traditional passage of grazers to far off lands.
- c) While before closure everybody grazed their animals on this land, after closure, the income from grass seed and disposal of sheep (reared as a part of share capital contribution) was distributed only amongst the members of cooperatives led by high caste big landlords.
- d) There was no system by which cattle required to graze in the plot for helping regeneration of grass could be distinguished on the basis of ownership, i.e., lesser charges for landless - higher charges for landed farmers.

Technological Options

An overview of various dimensions illustrated above would provide illustration of the complexity that problem of grazing land management has in semi-arid regions. While several policies aimed at different aspects of sisal economy trigger direct or indirect effects on pastoral household economy system, often the answers for most of these problems are assumed as closing the common lands or encouraging cultivation of fast growing exotic fodder plants which required some water in the early stages. We would summarize dimensions of the problems which technologists should take into account while searching solutions in the socio-ecological framework.

1. Management of existing common lands controlled by Panchayats (elected body of non-official) at village level:

- auction/bidding for cultivation/grazing
- closure for pasture demonstration
- grazing rights used as rewards for voting obligations in election
- control over water holes
- feudal control over grass lands

2. Demand/Supply and commoditization of fodder

- Prices of dry fodder/wheat/bajra straw
- Demand from non-traditional pockets of dairy activity (like sugarcane region)
- Price imperfections

- dwarf/short varieties
 - millets
 - cereals
 - (less dry matter content) irrigation
 - demand for fodder - diversification
 - reduced supply in dry regions
- weeding
 - road side enclosure
 - fodder - permits in drought year
3. Decay of traditional socio-ecological institutions like AURAN lands.
 4. Adverse effect of drought (disposal of cattle, depleted fodder resource, migration etc.)
 5. Poor have more browsers like sheep and rich had more grazers (within grazers - rich have more productive animals like buffaloes; poor have less productive cows.
 6. Mobility patterns of animals and human beings are linked up.
 7. Dry regions have been the breeding tract of some of the best livestock breeds of Asia
 8. Cross-breed livestock technology has automatically percolated to those who can absorb more risks
 9. Stall feeding is possible only by those who can stay put - i.e. those who have stable income.

Future Options

In a separate study (Gupta 1984), it is shown that the tree density of Prosopis cevararia in dry regions at the land holdings of marginal farmers are higher whereas with increase in land size the density decreased. In irrigated region, the pattern reverted. This finding reveals that poor farmers know well the importance of resource preservation, particularly regarding certain tree species of which almost every part is found useful. The implication is that we must shed some of our biases before looking for future options. Also, since the condition of private wasteland is no better than common waste lands, the case for privatization is really very weak.

Some tentative recommendations following from this analysis are:

1. Wherever pastoral development projects implying closure of common grazing lands are taken up, institutional arrangement for sharing of income from these lands which were major source of income for the poor should be worked out.
2. Public distribution system of dry fodder should be on urgent priority in drought prone regions. Ironically, most of the public distribution system even for essential items of human consumption is concentrated in metropolitan towns or 2-3 states of the country. It is, therefore, extremely important that drought-prone regions are given higher attention to provide PDS of fodder.
3. Much of the problems of grazing land management emerge in a

drought year, when most poor households are under serious stress and when bigger farmers increase their livestock holdings by operating as buyers. It will, therefore, be worthwhile to ensure that productive animals are not disposed off by poor farmers through public policies providing sustenance in such periods of stress. Alternatively, poor will have no recourse but to keep a large number of less productive animals to meet the survival requirements as well as deal with risks inherent in such regions.

4. There are large number of dual purpose livestock breeds in dry regions of Asia which are adapted to extreme environmental fluctuations. Proper management of these breeds could often exceed the productivity levels of exotic breeds crossed with local breeds in their native environment (Jain 1984). The extensive grazing system together with upgradation of traditional breeds through proper selection of breeding bulls should form the core of the new technological arrangement.
5. Stall feeding and extensive closures are not the answers in these regions. Often the technologists have ignored the problem of mobility which are major means of survival for marginal populations which also own the livestock. On the contrary, it would be worth while to organize systematic water and fodder points along the traditional migratory routes.
6. It is also important to legislate proper rights for inter-state

migration so that undue harassment of the poor pastoralists can be checked. India has recently taken a positive step in this direction.

7. It is tragic that watershed projects implemented by soil conservationists include predominantly the activities of land shaping, bunding etc., by foresters include the tree plantation and by agriculturists include intensive cultivation. Despite the ecological terminology used by experts of various disciplines, there is seldom a systematic socio-ecological framework used by watershed planners in which proper land use policy in consonance with the interest of poor population is worked out.
8. Is it not ironic that one of the major programmes for dairy development in the country has not attached much importance to the problem of dry fodder?

It will be useful to put these issues in proper focus so that social scientists and technologists can work together to identify the key breeding objectives for grass, trees, livestock, and crops for dry regions. The land use policies and institutional arrangements covering the access to provide common lands in these regions call for an extremely innovative approach in which the poor pastoralists should have significant say.

It is difficult to summarize such a paper which has tried to focus attention on numerous dimensions of grazing land management in dry regions. By using a socio-ecological framework, one can

appreciate the historical differences in the way access of different classes of farmers/pastoralists has emerged vis-a-vis various types of land markets and institutions. This access differential should not be worsened by providing technological alternatives that on one hand substitute the irrigated crop lands into tree farming for paper and textile industries and on the other hand intensify cultivation in dry regions with saline soils through financing for tractors and irrigation with the help of cheap credit.

We can conclude by suggesting that victims of the violence and tensions around the grazing land should not be made the culprits in the debate on environmental degradation. It is tragic that the problem of grazing land and supply of dry fodder have been neglected. The socio-ecological approach presented in this paper provides an alternative way of according urgency to a problem that affects some of the most vulnerable sections of rural society. We should act before their patience runs out and tensions overtake us.

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