

**RGICS Paper No.35
1996**



**NATURAL RESOURCES
MANAGEMENT FOR
POVERTY
ALLEVIATION**



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The views expressed in this paper are those of the author and are not necessarily those of the Institute.

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Suggested citation: B.B. Vohra, *Natural Resources Management for Poverty Alleviation*, RGICS Paper No.35 (New Delhi: Rajiv Gandhi Institute for Contemporary Studies, 1996) [PDF Version: 2010]

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Introduction

India is among the poorest countries in the world. According to the *World Bank's World Development Report 1995*, it occupies the 113th place in a list of 132 countries arranged in order of per capita GNP. It is in the same league as Mali, Niger, Burkina Faso and Nigeria.

This is not a record to be proud of, not in the 50th year of our Independence. The nation's self-respect demands that its central problem of massive poverty should no longer be treated in a casual manner but given the importance and priority that it deserves.

This will in turn necessarily demand that we should pay the most serious attention to making the best possible use of our natural resources which constitute our basic productive infrastructure.

An attempt has been made in this paper to outline the present disarray in the field of resource management, to view it in its historical setting and to suggest how it may be possibly remedied before the point of no return is reached.

The Current Scenario in Land Management

1.1 According to the latest Land Use Statistics (L.U.S.), the 304.9 million hectares (mh.) of India's geographical area for which information is available are being used as follows:

1. Area under non-agricultural uses	21.2 mh.
2. Barren and uncultivable lands	19.7 mh.
3. Net area sown	142.2 mh.
4. Forest lands under good tree cover (40% density and above)	38.6 mh. ¹
5. Miscellaneous tree crops and groves	3.7 mh.
6. Forest lands under poor tree cover	29.3 mh. ²
7. Cultivable wastelands	15.0 mh.
8. Current fallows	13.8 mh.
9. Old fallows	9.6 mh.
10. Permanent pastures and grazing grounds	11.8 mh.

Total: 304.9 mh.

1.2 An analysis of the above figure reveals that:

- If items 1 and 2 are excluded from consideration, the total land resources of India that possess any potential for biotic production are no more than 264.0 mh.
- Assuming that items 6 and 10 are more or less without vegetal cover—which would be a fair assumption to make—the maximum area that can be considered as “wastelands” is the sum of items 6 to 10. This amounts to 79.5 mh. which is almost one-third of 264 mh.
- This, however, does not mean that the remaining area of 184.5 mh. (264 mh. minus 79.5 mh.) is in good health. According to the L.U.S., the total extent of lands that suffer from degradation—to a greater or lesser degree—is 175 mh. Since this figure includes wastelands, it follows that the area of lands that are still productive but are degraded is 95.5 mh. (175 mh. minus 79.5 mh.).
- It also follows that this area of 95.5 mh. must necessarily be a part of the 142.2 mh. of lands that are under agriculture. This means that nearly two-thirds of India's agricultural lands are sick to some extent.
- The above picture would change somewhat if the figure of 175 mh. were to include barren and uncultivable lands (item No. 2). However, the broad picture would still be that nearly two-thirds of the total land resources in India are degraded, of which about 50% have undergone such levels of degradation that they have, for all purposes, ceased to be productive.

1.3 There is a great deal of confusion regarding the extent of wastelands in India. This has been caused by firstly, a lack of uniformity in the definition of “wastelands” by

¹ As per the latest statistics of the Forest Department.

² Arrived at by deducting the area under good forests (Item No. 4 above) from the total area under forests, i.e. 67.9 mh.

different authorities and secondly, by their failure to distinguish between lands that are badly degraded and unproductive and those that are still productive but are at varying levels of degradation. It would not be appropriate to describe the latter category of lands as “wastelands”— “degraded lands” would be a more scientific description for them.

1.4 Much effort has been wasted in recent years over the determination of the exact extent of wastelands and of their location. Since the country’s readiness to deal with this problem is still at a rudimentary level, it will be prudent to avoid such essentially peripheral matters and start work on the amelioration of sick lands on the basis of the knowledge that is already available in ample measure in every affected Indian village.

1.5 Land suffers basically from two major ailments— denudation and erosion— leading to the loss of the top-soil through the action of water and wind, and water-logging which finally results in the salinisation of the soil. According to available estimates, of the 175 mh. of degraded and wastelands that the country possesses, around 150 mh. suffer from erosion of the top-soil and its attendant ills (such as floods and gully formation, etc.) and around 25 mh. from waterlogging and salinisation. Of the lands subject to erosion, around 125 mh. suffer from water erosion and around 25 mh. from wind erosion.

1.6 There is no doubt that lands subject to erosion constitute the biggest single threat to India’s economy. For not only do such land suffer an increasing loss of productivity because of the progressive loss of the fertile top soil but they also contribute to the loss of a great deal of priceless sweet water by way of excessive run-off along denuded slopes. This run-off, loaded as it is with soil also causes a great deal of damage—resulting in flood and the premature siltation of damage—resulting in floods and the premature siltation of river beds, tank and reservoirs—before it reaches the sea. And since a large part of the water, under better conditions of land management, could have been retained either as soil moisture (so vital for rain-fed agricultural land) or as ground water (which is the mainstay of the country’s irrigation infrastructure today), its loss is a major reason for droughts. Floods and droughts are indeed two sides of the same coin of poor land management and both can be moderated very substantially by preventing excessive soil erosion.

1.7 India’s record in tackling problems of denudation and soil erosion has unfortunately been unsatisfactory and financially wasteful. Soil conservation schemes which have been there for nearly half a century failed to make any significant dent on the problem on account of their having disregarded the “complete mini-watershed” principle. As a result, excessive run-off from denuded forest land that are almost invariably situated in the higher reaches of watersheds has caused great damage to the terraces and bunds on agricultural fields, particularly because such bunds are not correctly aligned along contour line but built along field boundaries. This basic flaw is common to all the other schemes—such as the DPAP, DDP, RVP, FRRP, NWPR, JRY (in part), EAS and EGS (in part) and the IWDP—which aim essentially at soil and water conservation and explains why these too have not succeeded in their objectives.

1.8. The financial loss that has been incurred as a result of these flawed schemes has never been computed but it must be a considerable amount—as approximately Rs. 2000

crores have been spent on the DPAP and DDP alone since their inception. This is indeed a matter for great concern.

1.9 Our record in tackling problem of water-logging and salinisation is equally poor. As the eighth plan document admits, even a systematic survey of the extent and location of lands that are affected by this malady has not yet been conducted.

The Current Scenario in Water Management

2.1 Since the soil, however well-endowed it may be, is incapable of any biotic production in the absence of moisture, the management of water lies at the very heart of land management.

2.2 Although the total precipitation received by the country as a whole is around 350 million hectare metres (mhm.) per annum—which is theoretically capable of placing its entire land surface under approximately 115 cm. of water—this resource must be treated as a scarce resource because of firstly, its highly uneven spread in space as well as in time, and secondly, the steadily increasing demands that are being made on it not only by agriculture but also by the industrial and domestic sectors.

2.3 As in the case of all scarce resources, the management of water demands that special attention should be paid firstly, to its conservation to the maximum possible extent and secondly—in the present context—to its optimal use for agricultural production. A third requirement is that under no circumstances should this annually renewable resource be allowed to damage the non-renewable resource of the soil which it is meant to serve.

2.4 An overview of the water management scenario in India reveals that our traditional policies have proved to be seriously deficient on all these three counts and, therefore, need to be reviewed urgently.

2.5 As far as conservation is concerned, the traditional policy has been to rely on the creation of surface storages, whether big, medium or small. It is estimated that between 1950 and 1995 we have spent over Es. 50,000 crores on such projects and created a storage capacity of around 20 mhm. An idea of the scale of investment in this field can be obtained from the fact that during the Eighth Plan the Government will be spending around Es. 27,500 crores on this sector, or about Rs. 5,500 crores per annum.

2.6 However, we have come to a dead end on this route as investments in surface projects have latterly shown unmistakable signs of becoming unproductive. Thus, an investment of Rs. 11,107 crores on major and medium (M&M) projects during the Seventh Plan, according to the Ministry of Water Resource (MWR) statistics, not only failed in the creation of any additional potential but resulted in the loss of 0.6 mh. of even the potential that existed at the end of the Sixth Plan. Considering that the Seventh Plan had envisaged the creation of an additional potential of 4.3 mh. the net loss of planned potential between 1985 and 1990 amounted to 4.9 mh. the replacement value of which at current prices would be well in excess of Rs. 30,000 crores. This is a serious development indeed, and no explanation has so far been offered for it by the MWR.

2.7 The track record of small surface projects has, if anything, been worse. According to the L.U.S., the net area served by such projects declined from 8.2 mh in 1961 to 6.8 mh in 1989 in spite of the fact that around Es. 6,000 crores were invested in them during the intervening period of 28 years. However, in this case the reason behind the debacle is known—it lies in the premature siltation of reservoirs, which, being much

smaller than those of the M&M sector, are rendered inoperative that much more quickly.

2.8 In view of these developments, the time has come to reconsider the traditional approach to the problem of water conservation and adopt the only other available option, namely, the storage of water mainly in the form of soil moisture and ground water—within, rather than on the surface of the country's land mass. Not only is this option incomparably cheaper but it also involves no high technology and has proved to be a great success wherever it has been adopted. It consists basically in reducing the run-off of water to the sea by creating biotic as well as engineering impediments to the free flow of water along slopes so that it may get a better chance to percolate into the soil and sub-soil strata. The restoration of permanent vegetal cover, whether of grasses or trees, on all denuded lands—as far as possible through natural regeneration—the construction of innumerable small weirs, check-dams and small tanks across all drainage lines in all micro-catchments and the treatment of all erosion-prone agricultural lands for the conservation of both soil and water constitute the key elements of this alternative strategy.

2.9 It is imperative that a nation-wide programme for soil and water conservation be given the highest possible priority for a variety of reasons. It would, in the first place, help to reduce run-off losses and increase the availability of water in the form of soil moisture and ground water or water stored in countless small tanks and ponds. The enhancement of soil moisture would be particularly beneficial for the nation's rain-fed agricultural lands which account for nearly two-thirds of the total land under cultivation. The storage of water in village tanks and ponds would not only benefit local communities, but would also help in the replenishment of ground water. It may be noted here that ground water not only accounts for more than 50% of the total area under irrigation, but is also around 100% more efficient than canal water in terms of productivity per hectare. This is indeed the reason for its demand by farmers who can develop it quickly and easily with their own resources, assisted by bank loans, wherever necessary.

2.10 In the second place, such a programme would help in controlling the premature siltation of reservoirs and tanks—which in most cases are irreplaceable—in moderating floods by reducing the quantity of water and top-soil that rivers have to carry at peak periods, and by protecting their carrying capacity against siltation. In the third place, the return flow of water that takes place from fully charged ground water aquifers into springs and rivers during the lean season would also help to mitigate droughts.

2.11. the wisdom of conserving water mainly within the land mass and in Nature's own way rather than in man-made reservoirs becomes apparent when we consider the great difficulties that the MWR has encountered in putting to actual use the irrigation potential created by surface storages. Thus, in the M&M sector, the total potential created between 1950 and 1990 was 20.2 mh. of which, according to the Ministry's own claim, only 15.8 mh. had been utilised by 1990, thus revealing an unutilized gap of 4.4 mh. However, according to the L.U.S., which command much higher credibility, the unutilized gap in 1990 was as big as 9 mh.

2.12. The above analysis shows that our traditional policies have failed significantly from the point of view of both the conservation of water and putting it to good use. The continued failure on both these counts is reflected in the unbelievably high level that the cost of irrigation has reached- as distinguished from the cost of merely creating a potential which is of no use to anybody till it has been actually utilized. Thus, according to the L.U.S., the additional net area that was brought under irrigation in the M&M sector during the seventh plan was only 0.262 mh. If the total outlay of Rs. 11,107 crores is divided by this figure, the cost of actually bringing land under irrigation through the M&M route during 1985-90 works out to an incredible Rs. 4.24 lakhs per hectare.

2.13. The great scope that exists for conserving water within the Indian land mass is indicated by the fact that around 150 mh. (or nearly one-half of the country's land surface) suffer from soil erosion and would, if treated appropriately, be able to reduce run-off losses very substantially. The broad picture today is: of the 350 mhm. of precipitation that we receive annually, around 160 mhm. are lost to the sea as river flows, around 20 mhm. are stored as surface water, around 125 mhm. as soil moisture and around 45 mhm. as ground water. Empirical data compiled by the ICAR-on the basis of experiments carried out over 20 years in micro-watersheds in all part of India-suggest that a nation-wide programme of afforestation and soil and water conservation may well be able to reduce present run-off losses by 25% or say 40 mhm. and increase the quantity of water held as soil moisture and ground water to that extent. Undoubtedly, such a development would change the face of the country.

2.14. Traditional policies have also failed on the third count and permitted water to damage the land in two ways. Firstly, due to the inability to save a large part of the country's total land surface from denudation and erosion, we have allowed large quantities of the top soil to be displaced, year after year, as a result of the action of rain water. Way back in 1972, the quantity of top soil so eroded was estimated to be 6,000 million tones per annum-today the loss must be at least double this amount. In addition, such losses not only result in the progressive degradation of the land affected by reducing their fertility levels-as the top soil is the most fertile of all soil strata- but also contribute to a considerable damage in downstream area by way of floods, to which around 40 mh. are still vulnerable.

2.15. Secondly, as a result of the almost complete neglect of the problems of drainage, water-logging and salinisation of the soil, large quantities of once fertile lands have become unproductive. According to the latest available estimates, the area affected by these maladies increased from 14mh. in 1981 to 17.6mh. in 1985, thus registering a ground rate of 0.9mh. per annum. Assuming that the same growth rate has prevailed during the last decade, the area affected in 1995 should be around 27 mh. , a larger part of which is almost certainly situated in canal commands. This is a serious matter indeed, in view of the fact that unlike the control of erosion, which would on an average cost around Rs. 4,000 per hectare, the amelioration of waterlogged and saline lands requires much larger outlays-of the order of Rs. 30,000 to 40,000 per hectare-as drainage, especially underground drainage, is an expensive proposition.

2.16 In view of the above analysis, a thorough revamping of existing policies in water management is unavoidable. Such a review must take particular note of the following considerations:

- (a) Further investment in the creation of fresh potential in the surface irrigation sector must be suspended and all available resources should be diverted towards the utilization of the very substantial potential that has been already created but not used.
- (b) The working of existing canal systems must be improved so as to increase their productivity in terms of yields per hectare. Once this is done, irrigation rates, which are at present inordinately low, can be raised so as to prevent the loss of some Rs. 3,000 crores per annum on maintenance and operational costs alone.
- (c) Special attention must be paid to the problem of waterlogging and salinisation which has received little attention so far.
- (d) Existing flood protection policies—which aim at dealing with the symptoms of the disease rather than its real cause viz., poor land management—must be revised in favour of policies aimed at the prevention rather than the control of floods, through dykes and bunds.
- (e) The predominant position attained by ground water in the field of irrigation must be recognized and the management of this resource strengthened. The replenishment of this resource must be assisted through natural means such as better land management as well as through artificial recharge, and it must not be treated as a source of only “minor irrigation”.

2.17. It needs to be stressed that as in the field of land management, so also in the field of water management, existing policies are highly unsatisfactory and are the cause of very substantial losses to the government and damage to the economy. It is also clear that the key to better water management lies essentially in improved land management, through a country-wide control of denudation and soil erosion.

The Nexus between Poverty and Poor Resource Management

3.1 No attempt has ever been made—by an establishment that the late Dr. Sudhir Sen, eminent economist and author, used to describe as “resource illiterate”—to quantify in monetary terms the losses that the Indian economy is suffering as a result of poor resource management. However, there can be little doubt that these are of the most serious proportions.

3.2 Even if it is assumed, on a conservative basis, that our 175 mh. of degraded lands are intrinsically capable, if restored to health, of producing additional wealth—whether in the shape of crops or fruits or timber or fuel or even mere grasses—worth on an average around Rs.10,000 per hectare, the loss that is being sustained by the country works out to around Rs. 1,75,000 crores per annum. However, even this figure will prove to be an underestimate if we take into account the tremendous damage that is being caused to irrigation systems by the premature siltation of reservoirs and tanks and the damage caused by floods and droughts.

3.3 It may be mentioned in this connection that while very large numbers of small reservoirs have already gone out of operation on account of premature siltation, many of the bigger ones are also getting silted up at rates that are 4 to 16 times higher than those assumed at the stage of project formulation. As far as floods are concerned, the Eighth Plan document says that 40 mh. of India’s land surface are flood prone and that the area affected annually is on an average about 7.7 mh. On an average, over 1400 lives are lost every year and the damage caused to crops, homes, cattle and public utilities between 1953 and 1987 was nearly Rs. 27,000 crores. Information regarding expenditure incurred on meeting drinking water requirements during droughts is not readily available but is known to be substantial.

3.4 Another way of appreciating the economic consequences of poor resource management would be to put a price tag on both sweet water and the top-soil, and to stop looking at these resources as if they were free and inexhaustible gifts of Nature. As far as water is concerned, it is known that it has cost us around Rs. 50,000 crores to create a storage capacity of around 20 mhm. What this means is that if a systematic and effective nation-wide programme for the conservation of soil and water succeeds in reducing run-off losses by 25% or by 40 mhm., we shall have obtained a monetary advantage of approximately Rs, 100,000 crores per annum.

3.5 As far as the fertile top-soil is concerned, there is really no way of pricing it, because it is not merely a collection of chemicals and plant nutrients but an almost living medium that teems with micro-organisms whose variety and complexity continues to baffle scientists. And since it takes Nature hundreds of years to build an inch of the top-soil, it is for all purposes a non-renewable resource. However, even if we assume for it a price of only Rs. 100 per tonne and also assume—which is very likely—that the current rate of displacement of the top-soil due to erosion is around 10,000 million tonnes (mt.) per annum (up from around 6,000 mt. in 1972), the annual loss suffered by the economy on this account would be around Rs. 10,000 crores!

3.6. Be that as it may, it is quite clear that the country is paying extremely heavily for to manage its natural resources properly and that this is one of the prime reasons for

its poverty. The enormous but entirely avoidable losses that this is one of the prime reasons for its poverty. The enormous but entirely avoidable losses that are taking place as a result of deforestation, soil erosion, excessive run-off and the continued neglect of problems of an uncontrolled haemorrhage in a patient who is already severely debilitated.

3.7. It may be also mentioned in this connection that in a predominantly agricultural country like ours, it is not correct to make too fine a distinction between rural and urban poverty. For the large extent due to the exodus of the rural poor into urban area in search of employment. Urban poverty will get automatically reduced once this influx first ceases and then goes into reverse gear as economic conditions begin to improve in rural areas.

3.8. It is important to recognize that for combating poverty-which has become a national disgrace for a country that can rightfully take pride in its achievements in so many other fields-there is no all aspects of poor resource management. The surplus labour available in rural areas must be harnessed and systematically converted into permanent productive assets through extensive soil and water conservation and drainage works, the lining of canals and river beds, the raising of plantations of various kinds (including horticulture) and other allied activities.

3.9. Better resource managements must indeed form the bedrock of all plans for rural development and employment and replace the confusing medley of wasteful and uncoordinated schemes that operate in the field today in watertight compartments under the aegis of many different departments. To avoid infructuous expenditure and disappointments, resource management must be undertaken not in a narrowly sectoral manner but in a holistic fashion. The mini-watershed must be adopted as the unit for planning as well as implementation of all programmes of land improvement. The resources, both financial and human, of all departments concerned-such as forests, horticulture, agriculture, soil conservation, minor irrigation, drainage and rural development, etc.-must be brought at the field level to ensure the best possible results and at the minimum possible cost.

3.10. All this is easier said than done, considering that department loyalties and mind-sets are still fiercely exclusive. But hope lies in the fact that with the coming in of panchayati raj, all development agencies will necessarily have to yield to coordination at the levels of Zilla parishads, Block Samities and even Gram panchayats. Hope also lies in the emergence of increasingly active and knowledgeable NGOs in the field of rural development and resource management. Above all, there are the living examples of villages like Ralegaon Shindi and Sukho Majri-which have transformed their economics dramatically by achieving the fullest possible utilization of all local resources of land and water -to inspire other village communities to adopt similar approaches, and force government organisations, however, recalcitrant they may be, to fall in line with the need of the hour.

Wastelands Development: A Flawed Concept

4.1 While the 1985 decision to give special importance to the problem of wastelands was well-intentioned, in hindsight it is clear that it was not based on a proper appreciation of the overall situation in the field of resource management. It represented, in fact, an overly simplistic approach to a problem of great complexity and betrayed the preoccupation of its authors with degraded forest lands.

4.2 While announcing the setting up of the National Wastelands Development Board (NWDB), Shri Rajiv Gandhi mentioned that “continuing deforestation has brought us face to face with a major ecological and socio-economic crisis”. This observation was no doubt correct, but, only partially so, because it ignored the part played by non-forest lands in bringing about the crisis in question. It also failed to appreciate that although degraded forest lands represented a serious problem, they accounted for only 30 odd mh. out of the total of around 80 mh. that are wastelands, and represented an even smaller proportion of the country’s total degraded area of 175 mh., which must be held responsible as a whole for the present crisis.

4.3 The fact that the notification setting up the NWDB talks of the need for a “massive programme of afforestation and tree planting”—on forest wastelands alone and makes no mention of the existence of non-forest wastelands, including around 25 mh. of wastelands created by waterlogging and salinisation is indicative of the narrow view taken while assessing the problem of wastelands.

4.4 The failure of the NWDB was mainly due to the inability of the Forest Departments in the States to work in close coordination with other agencies concerned with non-forest wastelands in taking up cost-effective programmes based on the “complete mini-watershed” principle. The Eighth Plan document (1992) is explicit on this point and has observed as follows:

“An important reason why planning and action programmes for wastelands development have tended to remain inadequate is the lack of coordination between the Forest Organisation which is the implementing agency in most States and other departments like Agriculture, Horticulture, Soil Conservation, Minor Irrigation and Rural Department”. (Para 4.14.13)

“The existing wastelands development schemes generally are not based on integrating the control of run-off rain water for reducing erosion, soil and water conservation and water harvesting”. (Para 4.14.14)

4.5 The disappointing performance of the NWDB led the GOI in 1992 to move it out of the purview of the Ministry of Environment & Forests (MEF) and place it in the Ministry of Rural Development (MRD), where a special new Department of Wastelands Development (DWD) was created to host it. However, this move, intended to provide the NWDB with a new image and a new sense of purpose, lost much of its significance when, following the MEF’s reluctance to part with its jurisdiction on “forest wastelands”, it was decided to entrust the NWDB, as well as the DWD, only with responsibility for “non-forest wastelands”. Both these

organisations thus became misnomers and the former emerged weaker than before as a result of this administrative reform.

4.6 The present scenario in wastelands development is depressing in the extreme; not only is no attention being paid to wastelands that are suffering from waterlogging and salinisation, even the responsibility for attending to denuded wastelands has been the responsibility for attending to denuded wastelands has been split between two ministries and there is as yet no institutional arrangement for bringing them together to enable them to follow the “complete mini watershed” approach on the ground. It is necessary to remember are inextricably juxtaposed in most situations, neither of these can be tackled alone in a cost-effective manner under the existing administrative arrangements.

4.7 However, this is by no means the end of the story. For even if we were to correct this anomaly by creating a unified agency for dealing with both forest and non-forest wastelands, and even if we were to place responsibility for the reclamation of waterlogged and saline lands squarely on such an agency, the case for treating “wastelands development” as a subject by itself, would still be untenable. For such an approach would necessarily punch the problem of the 95 odd mh. of degraded agricultural lands further into the background. This would be a great tragedy because contrary to popular belief, the Department of Agriculture’s schemes for the conservation of soil and water on eroding agricultural land are not effective because they are being implemented in violation of the “complete mini-watershed” principle.

4.8 Since prevention is better than cure, and as wastelands are out of production in any case, the protection of degradation-prone agricultural lands against further deterioration merits a much higher priority than the amelioration of the former. This means that we should start worrying a little less about wastelands, but a little more about degraded lands which, if are not saved in time, may also get slowly converted into wasteland.

4.9 There is yet another consideration. If we cannot afford, any longer, to ignore the urgent need for attention towards wasteland and degraded lands, can we continue to be complacent with regard to the dangers of depletion and deterioration faced by land that do not belong to either of these categories and are believed to be in good health? Such lands are around 89 mh. (264 minus 175) in extent and comprise around 39 mh. of good forests and around 50 mh. of good agricultural land.

4.10 A little thought would show that, placed as we are, it would be dangerous to be complacent about our non-stick lands. As far as our remaining good forests are concerned, it is common knowledge that these continue to be exploited illegally-Veerappan in the south and functioning plywood factories in the North East are proof enough of this fact. It is necessary to mention in this connection that it would not be prudent to rely overmuch on satellite imagery for information regarding areas under good forest cover. For one thing, even if the density of a good forest comes down from 100% to 40% as a result of honeycombing and selective felling, it will continue to be shown as a forest with “good tree cover”. For another, the rapid natural spread of *Prosopis juliflora* on large open tracts in many parts of the country can also create the impression that the area under forests is not diminishing.

4.11 As far as our good agricultural lands are concerned, they are almost entirely under irrigation and as such are susceptible to the threat of waterlogging and salinisation. They are also often double or even triple-cropped and receive large applications of inorganic fertilizers and pesticides which can, over the long run, damage the soil. Good agricultural lands can also suffer depletion by being thoughtlessly diverted to non-agricultural uses such as farm-houses for the rich. It is necessary to remember in this context that the per capita availability of agricultural lands which stood at 0.48 hectare in 1951 is expected to go down to 0.14 hectare in the year 2000. It would, therefore, be desirable to keep an eye on the health of such lands and save them from damage or shrinkage.

4.12 In view of the above analysis, it is clear that the very concept of giving special attention to wastelands needs to be discarded in favour of a broader approach that will cater to the needs of land management in all its aspects. This means that, instead of a Department of Wastelands Development, we should have a Department of Land Resources and that instead of a NWDB that is concerned with the health of only around 50 mh. of non-forest wastelands (but is paying no attention to problems of waterlogging and salinisation) we must have an apex body like the Central Land Use Commission that the Government had decided to create in 1974 but was unable to do so due to a general lack of interest in this subject. Both these bodies must have responsibility for all problems relating to the country's land resources in their totality, no matter whether they are classified as forest lands or non-forest lands, as public lands or private lands, as healthy lands or sick lands and in case of the latter, whether they suffer from erosion or waterlogging.

A Record of Apathy

5.1 Our rather casual approach towards problems of resource management becomes evident when we consider the manner in which we have thrown away some very good opportunities for tackling them effectively. The first opportunity was presented by Shri K. M. Munshi's clarion call in 1952 for the greening of the country through a massive tree-planting programme aimed at placing one-third of the country's land surface under tree cover. However, instead of getting down seriously to the work of converting this grand vision into a solid reality, it was quietly turned into an annual ritual for the ceremonial planting of trees by VIPs. As a result, 40 years later not 33% but only around 13% of the country's land surface can claim to be under good tree cover.

5.2 The next opportunity came in 1973, when Mrs. Indira Gandhi approved a bold suggestion that the Centre should assume greater responsibility for the care of the country's total land resources and create a nodal authority for this purpose. In a historic minute dated December 29, 1973 she observed, inter alia, as follows:

“Based on our experience of soil erosion, droughts and floods and their increasing financial liability, a large part of which had to be borne by the Centre, the paper³ argues in favour of the creation of a Central Land Commission. I am in broad sympathy with its approach and feel that we can no longer afford to neglect our most important natural resource. This is not simply an environmental problem but one which is basic to the future of our country. **The stark question before us is whether our soil will be productive enough to sustain a population of one billion by the end of this century with higher standards of living than now prevail. We must have long-term plans to meet this contingency.**” (Emphasis added)

5.3 Mrs. Indira Gandhi considered this matter to be of such urgency that she asked her Minister of Planning to examine, within a period of two months, how the proposed Commission could be set up. However, while all the necessary motions were gone through, the proposal was ultimately allowed to die a slow death, ostensibly on the legalistic ground that land management is a State subject. The Centre contented itself with a recommendation to the States that they should take up the work of land management in their own territories through State Land Use Boards. But in the absence of an apex body at the Centre to provide the necessary leadership and backing in a new field of activity, such Boards as do exist have proved to be singularly ineffective.

5.4 It is interesting to note that the National Commission on Agriculture (1976) also gave its full support to the proposal for setting up of a Central Land Commission in words which deserve to be quoted:

“No specific agency of the government was charged till the end of the Fourth Five Year Plan with the responsibility for the proper use of the land. It

³ “A Charter for the Land” by B.B.Vohra, published in *The Economic and Political Weekly* of March 31, 1973.

was, however, soon realized that such a state of affairs where this important basic resource has no known custodian of its interests cannot be allowed to continue. Fully realizing the urgency of the problem, it has recently been decided that the existing vacuum in policies, organisations and programmes relating to land and soil management should be filled on an urgent basis.....At the national level, **it is proposed to have a Central Land Commission which will be charged with the overall responsibility for all matters relating to the assessment and optimum management of the country's land resources.** We fully support these measures.”(Emphasis added)

5.5 Four year later, in 1980, the N.D. Tiwari committee on Environment revived the proposal for the setting up of the Central Land Commission but to no avail. This Committee recommended that while a full-fledged new Department should be set up to look after the environmental problem of the country, the subject of proper land management was so important that it deserved to be looked after by a Central Land Commission which should serve as “policy making, coordinating and monitoring agency for all issues concerning the health and scientific management of our land resource”. However, while the former recommendation was out, no action was taken on the latter. Clearly there was as yet no political will to place the management of our land resources on a sound footing.

5.6 The sixth plan document (1980) also made a strong plea for better land management in terms which are as valid today as they were 16 years ago:

“The losses which the country is bearing on account of the continued degradation of its land resources are of staggering dimensions and constitute one of the important threats to our economic progress..... The country can hope to achieve a continuous improvement in agricultural production only if the problems of land degradation are tackled with the utmost vigour. Such an effort, through gigantic by any standards is, however, inescapable if the country's agricultural future is to be assured. **Considering that even after all possible steps are initiated immediately, it will be years before results begin to show and that further massive damage will inevitably continue during this period, there is absolutely no room for complacency on this front.**”(Emphasis added)

5.7 These fine sentiments were, however, only in the nature of lip service to the cause because they were not matched by any significantly larger allocations for better land management during the Sixth Plan period.

5.8 Hopes for a better deal for the land were revived once again in early 1985 when Shri Rajiv Gandhi warned the nation of the serious “ecological and socio-economic crisis” it faced and set up, along with the ill-fated NWDB, the National Land Use and Conservation Board (NLUCB) with responsibilities which were more or less in line with what had been earlier envisaged for the proposed Central Land Commission. However, the NLUCB proved to be stillborn, thanks mainly to its curious constitution—this bloated, 32-member body possessed no full-time members at all. Unbelievable as it may seem, even its part-time Member-Secretary was located in a Ministry different from that of the part-time Chairman, and was therefore not accountable to him in any manner.

5.9 With such a track record behind us, it is difficult to be sanguine about the future. However, regardless of what has happened in the past, it is incumbent on the Centre at this critical juncture to realise the gravity of the situation and treat land management as the core item of an agenda for national survival. It would also be useful to place this subject above party politics and hold urgent consultations with all important political parties as to how it should be approached.

5.10 The present arrangements—under which exclusive responsibilities are assigned to the following: the Agriculture Department for eroding agricultural lands, the Ministry of Water Resources for command area development and for the control of floods and waterlogging, the Department of Forests for forest lands and the Rural Development Department for community and revenue lands and area development programmes—are irrational and must be scrapped.

5.11 A 10 to 15-year indicative plan for dealing with all aspects of land management must be drawn up by the Centre within the shortest possible time. Simultaneously, the States must be asked to draw up their own long-term plans and to implement them in a time-bound manner under the watchful eye of the Centre. State Land Use Boards must be revamped and strengthened and a prestigious and adequately empowered Central Land Use Commission should be constituted to act as a custodian and conscience-keeper of the interests of the land, as a think-tank and repository of reliable data, as a clearing house for relevant information and as a catalyst for creating public awareness of what is at stake.

Money is not an Important Constraint

6.1 A superficial look at the magnitude of the problems that face us with regard to the 175 odd mh. of degraded lands and wastelands may give the impression that huge investments will be required to implement a time-bound programme for its amelioration, and that lack of financial resources may come in the way of such an undertaking.

6.2 Such fears are, however, largely imaginary. Looking at the matter a little more closely, we find that even if we assume that the 150-odd mh. of denuded and eroding lands will, on an average, require an investment of Rs. 4,000 per hectare and that 25-odd mh. waterlogged and saline lands will require Es. 30,000 per hectare, the total bill will be around Rs. 1,65,000 crores. If the programme is spread over 15 years, it will demand an annual outlay of around Es. 11,000 crores.

6.3 According to information collected by the DWD, the amounts that are presently available for schemes which have an important component of afforestation and soil and water conservation are as follows:

(Rs. Crore)

1	Ministry of Rural Areas & Employment (previously Rural Development)	1250 per annum
2	Ministry of Environment & Forests	906 per annum
3	Ministry of Agriculture & Cooperation	260 per annum
4	Planning Commission	362 per annum
5	NABARD	50 per annum
6	State Soil Conservation Departments	341 per annum
7	State Land Development Banks	1106 per annum
	Total	4275

This means that the gap in resources will be around Rs. 7,000 crores per annum. However, it will in fact be much smaller because allocations for rural development are likely to be increased steeply in the Ninth Plan.

6.4 Experience has shown that wherever local communities have come forward to take an active part in controlling grazing, and thereby facilitating the natural regeneration of vegetal cover on denuded lands, and in adopting other biotic and engineering means for conserving both soil and water, departmental costs have come down appreciably. Again, it cannot be denied that costs will also come down if existing leakages of funds are effectively plugged and schemes are implemented in a more efficient and cost-effective manner. It is pertinent to recall, in this connection, the well-known observation of Shri Rajiv Gandhi that hardly 15% of the enormous sums spent on rural development programmes succeed in benefiting the intended beneficiaries—the rest of the money either goes waste or into the wrong pockets.

6.5 What also needs to be appreciated is that due to our failure to plan and implement soil and water conservation schemes on a strictly “complete mini-watershed” basis, a good part of the investments that are now being made in this field prove to be infructuous. Once these deficiencies are removed and all available resources are

carefully pooled and utilized meaningfully, the entire position will change dramatically. The real problem, therefore, lies not in the scarcity of financial resources but in our present inability to utilize them to the best advantage.

Major Tasks Ahead and Some Suggestions for Tackling Them

7.1 In this chapter an attempt has been made firstly, to outline the most important tasks that face us and secondly, to suggest the kind of policy and administrative changes needed to tackle them effectively.

Task No. 1: Complacency Must be Shed

7.2 There has so far been no stern political will to tackle India's central problem of poverty and, therefore, of poor resource management. This in turn is due to the fact that the people who matter mistakenly believe that all is well on the agricultural front because we can operate the Public Distribution System (PDS) without having to import food grains. Unless this vicious circle is broken by a sustained and effective campaign for the perils inherent in the continued neglect and mismanagement of our natural resources, there is little likelihood of any great improvement in the situation.

7.3 A decision needs to be taken to mount such a campaign and to make the Ministry of Information and Broadcasting responsible for it.

Task no. 2: Soil and Water Must be conserved to the Maximum Possible Extent

7.4 There is no question that soil erosion—which affects around 150 mh. out of the country's total land area of 305 mh.—constitutes the biggest single threat to the sustainability of our agriculture, as well as of our economy as a whole. For not only does it increasingly reduce the productivity of the lands subject to erosion but also results in the loss to the sea of large quantities of priceless sweet water, in the siltation of reservoirs and rivers and in the aggravation of both floods and droughts.

7.5 The technologies for conserving both soil and water are well-known and simple in nature and an increasing number of villages (like Ralegaon Shindi) which have adopted them have demonstrated that these can be easily implemented by farmers themselves with a little outside help. Denuded lands must be allowed to regenerate themselves through the control of grazing and their soil and moisture regimes must be improved by biotic as well as engineering devices—such as contour trenches—before they are placed under plantations whether of fruit, fodder, fuel or timber. Simultaneously, agricultural lands—which are almost invariably situated in the lower reaches of the mini-watersheds—must be terraced and bunded along true contour lines. Run-off losses must be reduced at every possible point in each mini-watershed by creating physical barriers—such as weirs, nallah plugs and check-dams and storages—across all drainage lines. Such impediments not only help to conserve local resources of rainfall to the maximum possible extent in the form of soil moisture, ground water and small storages but also act as silt traps, and ensure that the water that leaves the mini- watershed is genuinely surplus to its own requirements.

7.6 A total approach of this kind has already brought about dramatic changes wherever it has been tried and needs to be adopted in all parts of the country, regardless of whether they receive heavy, moderate or little rainfall. The concept of zero or minimum soil loss, aimed at achieving the maximum conservation of both soil and water through biotic as well as engineering means needs to be popularised among

all rural communities to enable them to take an increasing interest in managing their own resources. At the same time, all the schemes which are essentially aimed at soil and water conservation but are being carried out today under a variety of descriptions—such as DPAP, DDP, RVP, FPRY, NWDPRA, IWDP, JRY, EAS, GGS—and by a number of departments, should be merged into a single scheme for “Soil and Water Conservation” which should be squarely based on the “complete mini-watershed” principle.

7.7 Such a reform will result in saving a lot of the expenditure which is at present being incurred wastefully because in the absence of inter-departmental coordination, none of the existing schemes, whether of the Ministry of E&F or of A&C or of R.A. and E is being implemented according to the “complete mini-watershed” principle. Considering the present total resources that are being invested in such schemes are over Rs. 4000 crores per annum, this reform will result in great financial benefit to the country.

7.8 It is suggested that a 15-year perspective national plan for the conservation of both soil and water and, therefore, for the amelioration of all the 150-odd mh. of degraded lands and wastelands that are erosion-prone should be formulated and taken up for implementation not later than the start of the Ninth Plan. This Plan should be only indicative in nature and should not be imposed in any way on State Governments. It is the affected villages that should be encouraged to draw up their own plans which should then be consolidated into District and State Plans.

7.9 Responsibility for this ambitious programme could appropriately be placed on the Ministry of R.A. & E which is responsible for the alleviation of rural poverty. This Ministry must achieve the requisite coordination between all the three Ministries concerned with afforestation and soil and water conservation schemes, if necessary, by obtaining orders of the Cabinet on this all-important point. It is essential to arrange for the suitable re-orientation and training of all existing staff in these three Ministries. It must consider ways of reorganising itself for new responsibilities, and explore how the existing DWD could be transformed into a new Department of Land Resources. The dissolution of the NWDB and the NAEB is another matter which needs to be considered urgently.

Task No. 3: Reclamation of Waterlogged and Saline Lands

7.10 This is a subject that has suffered great neglect; even reliable data regarding the extent of the damage done is not readily available. However, as already mentioned in para 2.15 above, it is very likely that in 1995, the affected area was as large as around 27 mh.

7.11 Since most such areas require to be provided with drainage, preferably underground, the cost of reclamation is very high—somewhere in the region of Rs. 30,000 to 40,000 per hectare. Perhaps, it is this high cost that has prevented both the Department of Agriculture and the Ministry of Water Resources from taking an active interest in this matter.

7.12 As in the case of land subject to erosion, a 15-year Plan must be drawn up for ameliorating not only the lands that have already suffered damage but also those

which are likely to face this threat in the near future. The responsibility for formulating and implementing this Plan must be placed squarely on MWR because of its expertise in executing drainage works and its responsibility for reducing seepage losses from unlined canals and preventing the improvident use of water, both of which contribute to waterlogging.

Task No. 4: Containment of Deserts

7.13 It is estimated that around 25 mh. suffer from wind erosion. These are mostly lands situated in the Rajasthan Desert, and there are reports that it is slowly expanding as a result of the movement of sand through wind action.

7.14 The ways of controlling the spread of deserts are known—they lie mostly in the putting up of wind barriers and shelter belts. A 10 to 15-year plan to enclose the Rajasthan Desert within a belt of suitable trees should be drawn and implemented. Simultaneously, steps should be taken to reclaim desert areas by controlling grazing so that natural regeneration of trees and grasses may take place.

7.15 Responsibility for this programme should be placed on the Ministry of R.A. & E.

Task No. 5: Protection of Good Agricultural Lands

7.16 As mentioned earlier there are only about 50 mh. of agricultural lands that are apparently in good health today, but are vulnerable to many serious threats. The health and physical integrity of all such lands must be carefully monitored and guarded as suggested in Para 4.11 above.

7.17 Responsibility for this task should be placed on the Ministry of Agriculture.

Task No. 6: Protection of Remaining Natural Forests

7.18 The pace at which the deterioration of our 39-odd mh. of good natural forests is taking place is not generally recognised. Many of these forests are not classified as “Reserve Forests” because of the rights enjoyed by local tribal populations. There are also other legal impediments in the way of effective action.

7.19 The Veerappan incident in the South and the apparent ease with which the extraction of valuable timber continues to take place in the North-East show how serious the problem is. It is necessary to give the highest priority to this matter and effectively end all unauthorised fellings in the remaining forests—if necessary by arming foresters with enhanced punitive and legal powers, as well as with weapons wherever the situation may so require.

7.20 Responsibility in this field should be placed on the Ministry of Environment & Forests.

Task No. 7: Containment of Coastal Erosion

7.21 This is another area of neglect which, considering the length of our coastline, can be the cause of great damage along uninhabited reaches without government

monitoring it. The matter needs to be studied carefully with the use of satellite imagery so that vulnerable areas may be monitored regularly and effective steps taken in time.

7.22 Responsibility for this task should be placed on the Department of Ocean Development.

Task No. 8: Review of Flood Control Policies

7.23 The failure of existing policies in this field is apparent from the fact that although Es. 2500 crores were spent on “flood control” programmes such as the construction of earthen embankments and dykes between 1954 and 1989, the area described as “flood prone” has nevertheless increased from around 25 mh. in 1950 to around 40 mh. in 1989.

7.24 It is time to realise that the root of the trouble lies in excessive run-off and soil losses in denuded catchments. These place additional demands on the water—carrying capacity of rivers even while reducing it by raising their beds through siltation. The real answer to the problem, therefore, lies in stepping up natural regeneration, afforestation, and soil and water conservation programmes in catchment areas in an effective manner. The emphasis should shift from “flood control” to “flood prevention” and from the treatment of symptoms to the treatment of the disease itself. The money saved by curtailing infructuous expenditure on the construction of earthen structures that get washed away ever so often should be diverted to the treatment of catchment areas.

7.25 Responsibility in this regard should be placed on the Ministry of Water Resources.

Task No. 9: Review of Policies on Surface Water

7.26 The MWR has been traditionally concentrating on the construction of surface irrigation projects as if this was an end in itself and not merely a means to the ultimate goal of greater agricultural production. This concept needs to be replaced by one that stresses the accountability of MWR for its performance in terms of its actual contribution to enhanced production. This is a matter of great importance because the more we succeed in the field of irrigation, the less will be the pressure on marginal rainfed agricultural lands which, in happier circumstances, should be reverted from cropping to horticulture, silviculture or pasture production in the interests of their own health and productivity as well as of downstream areas.

7.27 The seriousness of the present situation in the field of surface water management has already been described at length in Chapter 2. The suggestions contained in that Chapter deserve to be considered urgently by the MWR.

Task No. 10: Review of Policies on Ground Water

7.28 Ground water is bound to assume even greater importance in the years to come, firstly, because of the failure of surface water projects and secondly, because of the extreme ease and speed with which it can be developed in the private sector wherever

it is available at reasonable depths. However, the very attractiveness of this priceless resource is turning into a threat to its health and sustainability. Water tables are going down rapidly in many regions due to indiscriminate over-pumping and in certain (mostly coastal) areas; aquifers are getting infested with saline water.

7.29 So far inadequate importance has been given to ground water management by a Ministry that is overly pre-occupied with the expansion of the M&M sector. However, it would be a tragic mistake to continue to neglect this resource and take it for granted merely because it is a free gift of Nature. Action needs to be taken in the following three major directions:

- (a) The exploitation of ground water should be controlled to ensure that withdrawals do not exceed sustainable limits—the CGWB and State Government Water Boards should be vested with the necessary administrative and legal powers to achieve this end and also suitably strengthened.
- (b) Research in ground water should be stepped up. We must have the maximum possible knowledge of the nature and capability of each aquifer, and the source and exact extent of its recharge. Research in artificial recharge should be given particular attention for obvious reasons.
- (c) In view of the growing demands on this resource, its replenishment should be facilitated by all possible means, both natural and artificial. As far as the former is concerned, the successful implementation of Task No. 2 above will go a long way towards the enhancement of ground water resources.

7.30 Responsibility for this task has to be borne by the Ministry of Water Resources.

Task No. 11: Creation of a Central Land Use Commission

7.31 The “vacuum in policies, organisations, and programmes relating to land and soil management” that was noticed by the NCA in 1976 has unfortunately yet to be filled, even though the proposal for an adequately structured and empowered Central Land Use Commission (CLUC) was first mooted in 1973. Obviously, this vacuum should be filled without any further delay.

7.32 The exact form the proposed Commission would take is a matter that will require detailed study. However, a suggestion (following the pattern of the Planning Commission) that can be safely made is that it should be presided over by the Minister for R. A. & E (who is responsible for the amelioration of rural poverty) and have three to four full-time members of suitable rank, well-versed in matters relating to land management, and of whom one should be designated as the Deputy Chairman. The part-time members of the proposed body should be the Secretaries of the concerned Departments, namely, Agriculture & Cooperation, Environment & Forests, Water Resources, Rural Areas and Poverty Alleviation and the Planning Commission. The Member-Secretary of the proposed Commission should be a full-time officer of the rank of Secretary to the GOT, and should be assisted by an adequately equipped secretariat.

7.33 The Commission should be given a suitable mandate which should include responsibility for ensuring that the 10 tasks mentioned above are pursued energetically by the Ministries concerned and are not allowed to recede into the

background. It should act as the custodian and conscience keeper of the country's land resources and a vigilant watchdog of its interests. 7.34 Responsibility for this task should be placed on the Ministry of R.A. & E.

Task No. 12: Creation of Land Use Authorities at the State and District Levels

7.35 Although State Governments were advised as far back as 1974 to set up State Land Use Boards, the Boards that have been formed are more or less defunct. There is obvious need for setting up State Land Use Boards in the image of the CLUC and ensuring that they work energetically. At the District level, the Zilla Parishad should discharge all functions concerning the optimal use of local land resources.

7.36 Responsibility in this regard will rest with the Ministry of R.A. & E.

8 Last Word

8.1 When all is said and done, it must be remembered that like any other issue of great importance, the urgent need for better resource management is too serious a matter to be left to be tackled by Government alone. This is particularly true at a time when the latter have their hands full with many crises of a much more immediate nature than the insidious threat posed by the continuing mismanagement of the country's natural resources, however awesome this threat may be. One must also reckon with the fact that in the absence of a strong and informed public opinion on the subject, there is at present no will on the part of any political party to pressurise the Government on this forgotten front.

8.2 In the circumstances, a great responsibility rests on concerned citizens, who can read the writing on the wall, to come together to create a strong voluntary organisation that will act as a watch-dog of the nation's interests in this neglected field. Such a body should do everything possible to see that the issues that have been discussed above are kept alive, that greater awareness is created with regard to their urgency and that Governments, both at the Centre and in the States, are constantly reminded of their duties in this field.