Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

# Common property resources and land degradation in Tamil Nadu, India

**Unnamalai R*, Namasivayam D**

*Economics Wing, DDE, Annamalai University, Annamalai Nagar- 608 002, Tamil Nadu, India*
*unnasreco@gmail.com

**Abstract**

The main purpose of the present study is to estimate the changes that are taking place on wastelands in proportion to total geographical area in between the periods 1985 and 2000 for the selected 10 districts in Tamil Nadu, as per the wastelands map prepared by National Remote Sensing Agency (NRSA). The share of wasteland to the total geographical area has increased from 16.04 per cent in 1985 to 17.69 percent in 2000 for Tamil Nadu as a whole. The growth rate is the highest for barren rocky/stony waste/sheet rock area at 6.44 per cent. It means that this type of wasteland has increased at the rate of 6 per cent from the base year to the current year. It is followed by degraded land under plantation crop at 3.85 per cent, steep sloping area at 3.18 per cent and land affected by salinity and alkalinity – coastal/inland at 1.44 per cent. There is a marginal increase in growth rates of wastelands in the components of shifting cultivation area 0.13 per cent and underutilised / degraded notified forest lands 0.72 per cent in the state of Tamil Nadu in between the base and current years. However, the overall state average of growth rate is 0.04 per cent. It implies that all categories of wastelands have increased at 0.04 per cent from the base year to the current year. It could be reasoned out as population growth and technological change.

***Keywords***: Common Property Resources; Land Degradation; Wasteland; Tamil Nadu.

## Introduction

Agriculture is the mainstay for about 60 per cent of the population in Tamil Nadu. Agricultural sector contributes 17 per cent of the Net State Domestic Product. Nearly 52 per cent of the cultivated area is under dry farming conditions, apart from stagnation in cropping intensity, which is covering around 120 per cent. The area under fallow lands has increased over the years due to various reasons. Though, there is a shrinkage of area due to urbanization, the loss is compensated to a certain extent by increase in productivity of agricultural crops particularly, dryland agriculture (Burra Srinivas, 2002). At this juncture, the integrated intensive cropping system approach, value addition to agricultural products, watershed and wasteland development, integrated nutrient, pest and water management, are aimed at to pave the way for an evergreen revolution to meet the challenges (Agricultural Department, 2003).

The main purpose of the present study is to estimate the changes that are taking place on wastelands in proportion to total geographical area in between these periods for the selected 10 districts in Tamil Nadu, as per the wastelands map prepared by National Remote Sensing Agency (NRSA). It is to be understood that about 10 districts were covered for assessment of wastelands through satellite data for the year 1985.

The same districts were covered by the year 2000, in order to assess the changes that have taken place on the components of wastelands for these 10 districts in Tamil Nadu (Chopra Kanchan and Gulati, 2001).

In Tamil Nadu, out of the total extent of 130 lakh. ha., the land available for cultivation is only 43 per cent and needs to be gradually improved since its demand for agricultural under non-agricultural purposes is increasing; lands get degraded on account of various reasons like erosion by water, wind, and chemical changes through accumulation of salts, water-logging, reckless felling of trees and over-grazing of available pasture lands over the last few decades. The above features have greatly damaged the productivity of land, by reducing infiltration rates and water


©Indian Society for Education and Environment (iSee)

Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

*Table 1*. District wise Wastelands of Tamil Nadu (1985 and 2000), (Area in sq. kms.)

| Name of the District | 1985 | | | 2000 | | | ACGR of wasteland |
|---|---|---|---|---|---|---|---|
| | Total Geographical Area | Total Wasteland Area | Percentage of wasteland to the Total Geographical Area | Total Geographical Area | Total Wasteland Area | Percentage of wasteland to the Total Geographical Area | |
| Trichirapalli | 11095.00 (12.09) | 1389.50 (9.44) | 12.52 | 10991.00 (11.90) | 1389.50 (9.38) | 12.64 | 0 |
| Vellore | 12268.00 (13.37) | 2358.21 (16.02) | 19.22 | 12268.00 (13.28) | 2358.21 (15.93) | 19.22 | 0 |
| Salem | 8650.00 (9.43) | 1506.49 (10.23) | 17.42 | 8650.00 (9.36) | 1506.49 (10.17) | 17.42 | 0 |
| Dharmapuri | 9622.00 (10.49) | 1711.95 (11.63) | 17.97 | 9642.00 (10.44) | 2432.01 (16.43) | 25.22 | 2.36 |
| Pudukkottai | 4661.00 (5.08) | 1147.29 (7.79) | 24.61 | 4661.00 (5.05) | 510.07 (3.45) | 10.94 | -5.26 |
| Madurai | 12624.00 (13.76) | 2091.11 (14.20) | 16.56 | 12899.00 (13.96) | 2091.11 (14.12) | 16.21 | 0 |
| Cuddalore | 10985.00 (11.97) | 1433.95 (9.74) | 13.05 | 10900.00 (11.79) | 1433.98 (9.69) | 13.16 | 0 |
| Kanniyakumari | 1684.00 (1.84) | 216.52 (1.47) | 12.86 | 1674.00 (1.81) | 216.52 (1.64) | 12.93 | 0 |
| Erode | 8209.00 (8.95) | 2200.71 (14.95) | 26.81 | 8165.00 (8.84) | 2200.71 (14.86) | 26.95 | 0 |
| Ramanathapuram | 11935.16 (13.02) | 667.20 (4.53) | 5.59 | 12533.00 (13.57) | 667.20 (4.51) | 5.32 | 0 |
| | 91733.16 (100) | 14722.93 (100) | 166.43 (16.05) | 92383.00 (100) | 14805.80 (100) | 160.01 (16.03) | 0.04 |

*Source: 1,50,00 scale wasteland Maps Prepared from lands at Thematic Map/1RS LISS II/III Data. Figures in parentheses indicate the percentage of total wasteland to the total geographical area among the districts in respect of the base year 1985 and current year 2000.*

retention capacity increasing run-off and formation of gullies and ravines disrupt cycles rendering them as wastelands. The area under different categories of waste-land is 24 lakh hectares in Tamil Nadu, as per the estimate made by the Revenue department under eight fold classific- -ation.

## Objectives

To estimate the growth rates of degraded wastelands across the selected districts between the two points of time (1985&2000), as given by National Remote Sensing Agency (NRSA).

## Hypothesis

There is an increasing growth rate of degraded wastelands between the two points of time (1985&2000). To prove the hypothesis, viz., there is an increasing growth rate of degraded wastelands between the two points of time -1985and2000 as per the data given by the NRSA. This has been tested by using the Annual Compound Growth Rate. The detailed analysis is given below:

### Annual compound growth rate

$$r = \text{Antilog of } \left[ \frac{\log p_n / p_o}{N} \right] - 1 \times 100$$

where, r : compound growth rate

$P_o$: base year area under each of the wasteland components

$P_n$ : current year area under each of the wasteland components

N : number of years

## Results and Discussion

Table 1 explains the district wise wastelands of Tamil Nadu and their share to the total geographical area in between 1985 and 2000.

It is an interesting fact to note that the percentage share of wasteland to the total geographical area in between the base year (1985) and the current year (2000) has shown an increasing trend for the districts of Tiruchirapalli, Dharmapuri, Cuddalore, Kanniyakumari and Erode. On the other hand, the districts which have shown declining rate of wastelands are Pudukkottai, Madurai and Ramanathapuram. Similarly, the districts like Vellore and Salem have exhibited no change of sharing wastelands to the total geographical area in between the years. However, the share of wasteland has shown equal from 16.05per cent in 1985 to 16.03per cent in 2000 in Tamil Nadu as a whole. In fact, there is no change of wasteland to the total geographical area in Tiruchirapalli, Vellore, Salem, Madurai, Cuddalore, Kanniyakumari, Erode and Ramanathapuram. However, the increasing trend of


©Indian Society for Education and Environment (iSee)

Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

*Table 2*. Annual compound ground rate of various types of Degraded lands in Tamil Nadu (1985 and 2000)*

| District | Gullied and / or Ravined Land | Land With or Without Scrub | Water - Logged & Marshy Land | Land affected by Salinity / Alkalinity – Coastal / Inland | Shifting Cultivation Area | Under Utilised / Degraded Notified Forest land | Degraded Pastures / Grazing Land | Degraded Land under Plantation Crops area | Sands-Desertic /Coastal area | Mining / Industrial Wastelands | Barren Rocky / Stony Waste / Sheet Rocky Area | Steep Sloping Area | Snow Covered and/or Glacial Area |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichirapalli | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vellore | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salem | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dharmapuri | 0 | 0 | 0 | 0 | 0 | 4.61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pudukkottai | 0 | -6.21 | 0 | 1.63 | 0 | -3.35 | 0 | 0 | -3.16 | 0 | 0 | 0.89 | 0 |
| Madurai | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cuddalore | 3.15 | 8.87 | 0 | 0 | 0.12 | 0 | 0 | 3.30 | 0 | 0 | 1.57 | 0 | 0 |
| Kanniyakumari | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Erode | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ramanathapuram | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **3.03** | **-0.69** | **0** | **1.43** | **0.12** | **0.71** | **0** | **3.85** | **-0.82** | **0** | **6.44** | **3.17** | |

***Source:*** **Original data for various types of degraded lands for the year 1985 and 2000 are a avilable with the author*

growth rates of this wasteland is the highest for Dharmapuri at 2.37 per cent. Nevertheless, the growth rate of wasteland has decreased at the rate of 5.26 per cent in Pudukkottai District. The overall average of growth rate for the state as a whole is 0.04 per cent. It implies that the wasteland has increased at the rate of 0.04 per cent in between the years. This is mainly due to the following reasons: increasing pressure of population and the excessive demand for more land, both for agriculture and non-agricultural uses, which has resulted in the creation of vast stretches of wastelands. It has also been leading to ecological imbalances. Inadequate recharge is also becoming increasingly serious in Tamil Nadu, where the level of exploitation exceeds 60 per cent. The problem is particularly acute in Dharmapuri district of Tamil Nadu, where ground water aquifers have become permanently depleted because of inadequate recharge (Datta *et al*., 2000 and 2004).

The analysis on growth rates of each component of wastelands among the selected districts in between the base and current years are analysed and results are presented in Table 2.

It is an interesting point to note that there is no Gullied/Revined land in Tiruchirapalli, Vellore, Salem, Dharmapuri, Pudukkottai, Madurai, Kanniyakumari, Erode and Ramanathapuram. However, the growth rates of this type of wasteland are the highest for Cuddalore district at 3.15 per cent. It means that this type of land has increased at the rate of 3 per cent from the base year to the current year in this district. The gullies are the first stage of excessive land dissection followed by their networking, which lead to the development of various lands. Similarly, the ravinous are extensive systems of gullies developed along the river courses. This type of wasteland could be seen with an increasing trend only in Cuddalore district. The over-all districts average comes out to be 3.03 per cent. It means that there is an increase of this type of wasteland by about 3 per cent over the last 15 years in the state of Tamil Nadu (Tejbir Singh, 2001).

The results on growth rates of land with/without scrub land. There is no upland with/without scrub of wasteland in Tiruchirapalli, Vellore, Salem, Dharmapuri, Madurai, Kanniyakumari, Erode and Ramanathapuram. The highest growth rate of this type of wasteland is in Cuddalore district at 8.87 per cent. It implies that this type of wasteland has increased at 8 per cent from the base year 1985 to the current year 2000. This wasteland is generally prone is deterioration due to erosion and may or may not have scrub cover. Such land occupies relatively high topographic locations. It is followed by Pudukkottai with a declining land of this type at -6.21 per cent. This is mainly due to effective implementation of farm forestry and social forestry programmes under rural development in Pudukkottai district. However, the overall district average growth rate is -0.69 per cent. It shows that this type of wasteland with or without scrub-lands


©Indian Society for Education and Environment (iSee)

Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

has decreased at -0.69 per cent from base to the current year.

There is no water logged and marshy land for all the selected districts, except in the case of Cuddalore and Ramanathapuram. However, there is no change to this type of wasteland for the above two districts from the base year to the current year and similar in the case of the pooled districts' average. Most of the lands grow permanently or periodically inundated by water and is characterised by vegetation, which includes grass and weeds.

The results on growth rates of land affected by salinity/alkalinity– coastal/inland. This type of wasteland is not located in Kanniyakumari. Similarly, in the remaining selected 8 districts, there is no change of this type of land in between the base and current year. However, in Pudukkottai there is a change in growth rate of land affected by salinity/Alkalinity and Coastal/Inland. The growth rate of this type of wasteland is 1.63 per cent from base to the current year. This effect of salinization and/or alkalinization due to inadequate drainage, inefficient use of water resources and social political reasons. Similar results could be seen for the pooled districts average.

The results on growth rates of shifting cultivation area indicate that there is no shifting of cultivation land in Tiruchirapalli, Vellore, Salem, Dharmapuri, Pudukkottai, Madurai, Kanniyakumari, Erode and Ramanathapuram. The highest growth rate of this type of wasteland is seen in Cuddalore district at 0.12 per cent. It implies that this type of wasteland has increased at 0.12 per cent from base year to current year. This type of wasteland, viz., and shifting cultivation area includes felling of trees and burning of forest areas for growing crops. This results in extensive soil losses, land degradation and extinction of flora and fauna. However, the overall districts average of growth rate is 0.12 per cent. It means that the type of wasteland enhances at the rate of 0.12 per cent from base to the current year. This is mainly influenced by this type of wasteland in Cuddalore district.

The results on growth rate of underutilized/degraded notified forest land exhibit that the highest growth rate of this wasteland is visible in Dharmapuri at 4.62 per cent. It shows that this type of wasteland has increased at 5 per cent from the base year to the current year. However, this wasteland has decreased at the rate of 3.35 per cent in Pudukkottai from the base year to the current year. This is mainly due to effective implementation of farm forestry and social forestry programmes under rural development in Pudukkottai district. With regard to the other selected districts, there is no change of this type of wasteland. However, the overall districts average growth rate is 0.71per cent. It shows that this type of wasteland, viz., underutilized degraded notified forest land has increased at the rate of 0.71 per cent from the base year to the current year. The change is mainly due to the influence of this type of wasteland in Dharmpuri district.

The results on growth rates of degraded pastures/grazing land. Here, there is no degraded pastures/grazing land specifically in the districts like Tiruchirapalli, Pudukkottai, Madurai, Cuddalore and Kanniyakumari, because there is a considerable improvement of common lands in the form of village common grazing lands and permanent pastures through the rural development programmes. Those lands meet the fodder requirements of livestock. However, there is no change in the growth rate of this type of wasteland in Vellore, Salem, Dharmapuri, Erode and Ramnathapuram districts. Similar results could be seen in the case of pooled districts' average. It implies that there is no change of degraded pastures/grazing lands in the selected districts as well as for the state as a whole (Dregne, 1992 and 1987).

The results on growth rates of degraded land under plantation of crop land present that there is no change in growth rate of degraded land under plantation crop in Tiruchirapalli, Vellore, Salem, Dharmapuri, Madurai, Kanniyakumari, Erode and Ramanathapuram. However, the growth rates of this type of wastelands are the highest in Cuddalore


©Indian Society for Education and Environment (iSee)

Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

district at 3.30 per cent. It means that this type of wasteland has increased at the rate of 3per cent for the district. The overall districts average growth rate is marginally increased by 3.85 per cent. It means that the degraded land under plantation crop has increased marginally by 3.85 per cent from the base to the current year. This is mainly due to deterioration of land due to continuous usage of chemical fertilizers and pesticides. Further, the cyclical cultivation of land for the whole year without any gap.

There is no change in growth rate of sands-desertic and coastal land in Tiruchirapalli, Vellore, Salem, Madurai, Cuddalore, Kanniyakumari, Erode and Ramanathapuram. However, the growth rate of this type of wasteland has decreased in Pudukkottai at -3.16 per cent. This is mainly due to full implementation of social forestry programme by planting karuvel, eucalyptus trees. However, the overall districts average growth rate has been decreasing at the rate of -0.82 per cent from the base year to the current year. It means that this type of wasteland has decreased by -0.82 per cent for the last 15 years, mainly due to implementation of rural development programmes, effectively in Pudukkottai district.

There is no mining industrial wasteland for the districts, viz., Dharmapuri, Pudukkottai, Madurai and Kanniyakumari. However, there is no change in growth rate of this type of wasteland in Tiruchirapalli, Vellore, Salem, Cuddalore, Erode and Ramanathapuram. The highest industrial wastelands could be seen in the districts like Salem and Cuddalore. The mining wastelands operate mainly due to deterioration of land. Similarly, the industrial wastelands occur on account of large scale industrial effluent discharge. The growth rate of this mining /industrial wastelands have no change in between the base and current year for the state as a whole.

There is no change in growth rate of barren rocky/stony waste/sheet rocky land specifically in Tiruchirapalli, Vellore, Salem, Dharmapuri, Pudukkottai, Madurai, Kanniyakumari, Erode and Ramanathapuram. However, there is a marginal increase in growth rate of this type of wasteland in Cuddalore at 1.57 per cent. It means that this type of wasteland has increased at the rate of 2 per cent for the district. This is mainly due to the existence of rocky lands, there may be a possibility of presence of rocks, particularly hills during the long past. The overall districts average growth rate is marginally increased by 6.44 per cent. It means that there is an increasing trend of this wasteland to the tune of 6.44 per cent in between these years for the state as a whole.

There is no change in growth rate of steep sloping land in Tiruchirapalli, Vellore, Salem, Dharmapuri, Madurai, Cuddalore, Kanniyakumari and Erode. However, there is no steep sloping land in Ramathrampuram district. This is mainly because Ramanathapuram district is in the coastal region. The highest growth rate of this type of wasteland is seen in Pudukkottai at 0.89 per cent. It implies that this type of wasteland has increased at the rate of 0.89 per cent from the base year to the current year. However, the overall districts average growth rate is 3.17 per cent. It means that there is a marginal increasing of steep slopping land for the Tamil Nadu as a whole (Debashis Das *et al*., 1995).

On snow covered and/or glacial land it is interesting to note that there does no wasteland in all the selected districts as well as in the state of Tamil Nadu, since there is no such climate exist.

Table 3 indicates the category wise land of Tamil Nadu and its share to the total geographical area in between 1985 and 2000. It is an interesting fact to note that the percentage share of wasteland to the total geographical area in between the base year (1985) and the current year (2000) has shown an increasing trend for the wasteland like land affected by salinity/alkalinity-costal/inland. Shifting cultivation area, degraded land under plantation crop, barren rocky/stony waste/sheet rock area, underutilized and degraded notified forest land and steep sloping area (Ghose, 2002). On the other hand, the wasteland categories, which have shown a declining growth rate of wasteland are land with or without scrub and sands-inland/costal. Similarly, the wasteland categories


©Indian Society for Education and Environment (iSee)

Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

*Table 3*. Category wise wastelands in Tamil Nadu (1985 and 2000) (area in sq. Kms), *source: Wasteland Atlas of India (1985 and 2000)*

| Category | 1985 | | 2000 | | ACGR of Wasteland |
|---|---|---|---|---|---|
| | Total Wastelands | % of Wasteland to the total Geographical area | Total Wastelands | % of Wasteland to the total Geographical area | |
| Gullied and / or Ravinous land | 219.56 | 0.24 | 219.56 | 0.17 | 0 |
| Land with or without scrub | 5799.26 | 6.32 | 5219.93 | 5.92 | -0.69 |
| Waterlogged and Marshy land | 67.46 | 0.07 | 67.46 | 0.32 | 0 |
| Land affected by salinity/alkalinity – Coastal/ inland | 463.79 | 0.50 | 463.80 | 1.91 | 1.43 |
| Shifting cultivation area | 0.52 | 0.00 | 0.53 | 0.00 | 0.12 |
| Under utilized / degraded notified forest land | 6188.10 | 6.75 | 6886.34 | 7.41 | 0.71 |
| Degraded postures / grazing land | 168.50 | 0.18 | 168.50 | 0.13 | 0 |
| Degraded land under plantation crop | 172.99 | 0.18 | 173.00 | 0.17 | 3.85 |
| Sands – Inland / costal | 310.04 | 0.34 | 273.96 | 0.45 | -0.82 |
| Mining / Industrial wastelands | 87.39 | 0.09 | 87.39 | 0.09 | 0 |
| Barren rocky / Stony waste / sheet rock area | 1035.18 | 1.13 | 1035.19 | 0.89 | 6.44 |
| Steep sloping area | 209.70 | 0.23 | 209.71 | 0.23 | 3.17 |
| Snow covered and / or glacial area | 0.00 | 0.00 | 0.00 | 0.00 | 0 |
| Total wasteland | 14723.29 | 16.04 | 14805.37 | 17.69 | 0.03 |

***Data Source:*** *1,50,000 Scale Wasteland Maps Prepared from Lands at Thematic Map / 1 RS LISS II / III Data*

like gullied and/or ravinous land, water–logged and marshy land, degraded pastures/grazing land, and mining - industrial wastelands have no change in area in between these years. However, the share of wasteland to the total geographical area has increased from 16.04 per cent to 17.69 per cent in 2000 for Tamil Nadu as a whole. The growth rate is the highest for barren rocky/stony waste/sheet rock area at 6.44 per cent. It means that this type of wasteland has increased at the rate of 6 per cent from the base year to the current year. It is followed by degraded land under plantation crop at 3.85 per cent, steep sloping area at 3.18 per cent and land affected by salinity and alkalinity – coastal/inland at 1.44 per cent. There is a marginal increase in growth rates of wastelands in the components of shifting cultivation area 0.13 per cent and underutilized/degraded notified forest lands 0.72 per cent in the state of Tamil Nadu in between the base and current years. However, the overall state average of growth rate is 0.04 per cent. It implies that all categories of wastelands have increased at 0.04 per cent from the base year to the current year. It could be reasoned out as follows: (i) population growth and (ii) technological change.

Population growth eventually led society to abandon the fallow period all together and to search for methods of restoring fertility, which the fallow period has achieved naturally. For soil fertility to be sustained or improved, the soil's natural reaction capacity has to be replaced by other inputs and technology. One immediate reaction to declining fertility is to increase labour inputs. Similar substitutions occur with the use of organic manure and subsequently, artificial fertilizers, animal draft power and latter still, mechanical power. This process describes the general transition from extensive to intensive agriculture, but it is important to recognise that some agricultural eco–systems cannot support intensive farming technologies. Some soils are quickly eroded by mechanical tillage, for example agriculture development is a process in which soil degradation brought on by the loss of regeneration (due to declining of fallow periods) competes with technological advance and begins considering the type of soil and eco- system in place. The process therefore seems to be that population growth leads to reduction of fallow periods and to increase farming intensity. This, in turn, reduces soil productivity. Farmers react by introducing technological changes. Either, the increase in total cropped area or the decrease in the same is mainly due to population growth, which leads to


©Indian Society for Education and Environment (iSee)

Indian J. Innovations Dev., Vol. 1, No. 2 (Feb 2012) ISSN 2277 - 5390

technological change. Further, this change completely reduces fertility of the soil.

**Policy implications**

The different types of land uses have environmental implications in terms of land degradation. Land degradation is not solely and agricultural problem. It can also be caused by any of the imposed uses, which are determined by the society's-need for fiber, timber and fuel, sites for cities, industries, transport corridors, recreation facilities, mining extraction and disposal of waste material and for reserving genetic material for further use. Therefore, land use planning would ensure the land use, which would preserve the land resources for future while exploiting same in the present.

- Common governance by the public and creation of awareness among the resource users through proper extension strategies will bring out a fruitful outcome.
- Non-governmental organizations with their in built flexibility can be best utilized in addressing the sustainability of CPRs. The best of the services of the governmental and non-governmental sectors need to be harnessed for evolving a solution to this problem of degradation of CPRs.
- Erosion of the common property resources is evident in the study area. This is mainly attributed to the clearing of dense forest jungles, the burning and clearing for rainfed rotational crop cultivation, and the felling of timber. This destroys natural ecology and tends to dry up water resources used for irrigation of crop and drinking. Farmers due to their small farm sizes practice this form of cultivation. Hence, it could be prevented by proper land reform policies, inland distribution, and by legal enactments in the use of these resources.

## References


1. Agricultural Department (2003) *Policy Note on Agriculture 2002-03,* Government of Tamil Nadu, Chennai, 93-113.
2. Burra Srinivas (2002) Soil and water conservation works and Tribal development sustainability and effectiveness: A comparative study. *Journal of Rural Development*, 21(1).
3. Chopra Kanchan SC and Gulati (2001) Migration, Common Property Resources and Environmental Degradation : Rural – Urban Migration and Property Rights Structures, New Delhi : Sage Publications.
4. Datta KK, de -Jong C and Rajashekharappa MT (2004) Implication of Land Degradation on Crop Productivity – Some Evidences from Saline Areas in North – West India. *Indian Journal of Agricultural Economics*, 59(1), 151-163.
5. Datta KK, Jong-C-de and de-Jong C (2000) Adverse Effect of Water-logging and Soil Salinity on Crop and Land Productivity in North-west region of Haryana, India. *Agriculture Water Management*, 57(3), 223-238.
6. Debashis Das, Das D, Singh RB and Haigh MJ (1995) Problems of Soil Erosion and Measures for its Control, Sustainable reconstruction of highland and headwater regions, Proceedings of Third International Symposium on Headwater Control, New Delhi, India, 6(8), 497-506.
7. Dregne HE (1992) Erosion and Soil Productivity in Asia. *Journal of Soil and Water Conservation*, 47(1), 8-13.
8. Dregne HE (1987) Soil Erosion: Cause and Effect. *Land Use Policy*, 4(1), 412-414.
9. Ghose MK (2002) Effects of Erosion on Some Properties of Soil within the top 0.2m, of storage dumps, *Land Contamination and Reclamation*, 10(2), 107-114.
10. Tejbir Singh (2001) Wastelands a Symposium on regenerating our degraded land resource, *Seminar*, 449, 12-31.
11. Wasteland Atlas of India (1985 and 2000) Ministry of Rural Development, Department of Land Resources, Government of India, New Delhi and National Remote Sensing Agency, Department of Space, Government of India, Balanagar, Hyderabad. HHP.//rural. Nic.in/waste.htm.



©Indian Society for Education and Environment (iSee)