

Land Degradation Scenario of India and Programmes/Schemes for development of degraded lands

1. Introduction

The land serves as storage for water and nutrients required for plants and other living micro-macro-organisms. The demand for food, energy and other human requirements depends upon the preservation and improvement of the productivity of land. But land resources are limited. India has about 18% of world's population and 15% of livestock population to be supported from only 2% of geographical area and 1.5% of forest and pasture lands. The increasing human and animal population has reduced the availability of land over the decades. The per capita availability of land has declined from 0.89 hectare in 1951 to 0.37 hectare in 1991 and is projected to slide down to 0.20 hectare in 2035. As far as agricultural land is concerned the per capita availability of land has declined from 0.48 hectare in 1951 to 0.16 hectare in 1991 and is likely to decline further to 0.08 hectare in 2035. This decline in per capita land availability in the country is mostly on account of rising population.

Out of 328.7 million hectare of geographical area of India, about 141 million hectares is Net Cultivated Area. Of this, about 57 million hectare (40%) is irrigated and the remaining 85 million ha. (60%) is rainfed. This area is generally subject to wind and water erosion and is in different stages of degradation for subjecting to intensive agricultural production. Therefore, it needs improvement in terms of its productivity per unit of land and per unit of water for optimum production. Rainfed agriculture is characterized by low levels of productivity and low input usage. Crop production is subjected to considerable instability from year to year due to its dependence on rainfall, which is slightly erratic and variant in space and time. More than 200 million of the rural poor live in the rainfed regions. These risk prone areas exhibit a wide variation and instability in yields.

The information on the extent of soil degradation in the country has been assessed by various agencies. The estimates of these agencies vary widely i.e. 63.9 m.ha. to 187.0 m.ha., due to different approaches in defining degraded soils and adopting various criteria for delineation. The main agencies that have estimated soil degradation are; National Commission on Agriculture (NCA, 1976), Society for Promotion of Wasteland Developments (SPWD, 1984), National Remote Sensing Agency (NRSA, 1985), Ministry of Agriculture (1985), and National Bureau of Soil Survey and Land Use Planning (NBSSLUP, 1984 & 2005).

The problems of land degradation are prevalent in many forms throughout the country. In most cases, a combination of such problem exists. In absence of comprehensive and periodic scientific surveys, estimates have been made on the basis of localized surveys and studies. Recently, (2005) National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), Nagpur of ICAR has published that 146.82 million hectare area is reported to be suffering from various kinds of land degradation. It includes water erosion 93.68 million ha., wind erosion 9.48 million ha., water logging/flooding 14.30 million ha., salinity/alkalinity 5.94 million ha., soil acidity 16.04 million ha. and complex problem 7.38 million ha. The State-wise details of extent of various kind of lands degradation are given in Annexure-I.

2. Watershed Programme for Development of Degraded Land

Various Watershed Development Programmes are being implemented by mainly three ministries, namely, Ministry of Agriculture, Ministry of Rural

Development & Ministry of Environment & Forests for development of degraded lands. These programmes are namely, (i) National Watershed Development Project for Rainfed Areas (NWDPR), (ii) Soil Conservation in the Catchments of River Valley Project & Flood Prone River (RVP & FPR), (iii) Reclamation & Development of Alkali & Acid Soil (RADAS), (iv) Watershed Development Project in Shifting Cultivation Areas (WDPSCA) (v) Drought Prone Area Programme (DPAP) (vi) Integrated Wasteland Development Programme (IWDP) and National Afforestation & Eco – Development Project (NAEP). In addition to above, few Externally Aided Projects (EAPs) are being implemented with technical and financial assistance of external agencies.

Since inception upto Tenth Five Year Plan, an area of 50.89 million ha. has been developed with an expenditure of Rs.19251.22 crore. The details of scheme – wise achievements made upto IX Five Year Plan, during X Plan and since inception upto X plan are given in Annexure – II. Parts of such developed lands are brought under cultivation to maintain balance in different types of land uses.

3. Schemes/Programmes for Development of Degraded Lands of Ministry of Agriculture, Department of Agriculture & Cooperation:

I. Schemes/Programmes of NRM Division

The Natural Resource Management Division is implementing mainly three Centrally Sponsored Programmes and three Central Sector Schemes with major objectives of prevention of land degradation and restoration of productive potential of the degraded lands in the country. The Scheme-wise highlights of the programme/scheme are:

(A) Central Sector Scheme(Plan & Non Plan):

- 1) **SLUSI:** The Central Sector Scheme of 'Soil & Land Use Survey of India (SLUSI)' facilitates various types of soil surveys of catchments/watersheds. The organization is also engaged in preparation of district-wise map of land degradation. **The proposed targets for 2008-09 for SLUSI are as under:**

(a) Rapid Reconnaissance Survey (RRS)	-	160.00 lakh ha.
(b) Detailed Soil Survey (DSS)	-	1.42 lakh ha.
(c) Land Degradation Mapping (LDM)	-	110.00 lakh ha.
(d) Soil Resource Mapping (SRM)	-	156.00 lakh ha.

An amount of Rs 11.00 crore under Plan & Rs. 1.41 crore for Non-Plan is allocated for completing the targets.

- 2) **SCTC-DVC(Non-Plan)** : The 'Soil Conservation Training Centre at Damodar Valley Corporation, Hazaribagh' is being finance and implemented as non-plan scheme for imparting training / capacity building of the officials working for soil & water conservation programme in the State Governments. **During 2008-09, an amount of Rs.0.40 crore is allocated for conducting various short & medium training courses.**
- 3) **WDPSCA (Plan)** : A special Central Assistance to State Plan Scheme on 'Watershed Development Project in Shifting Cultivation Areas (WDPSCA)' is being implemented in North Eastern States with 100% Special

Assistance to Sate Plan. Under this scheme, an area of 3.93 lakh ha. have been treated since inception upto X Plan. During 2008-09, about 0.40 lakh ha. area to be treated at an estimated cost of Rs 40.00 crore.

(B) Centrally Sponsored Programme-(Plan - Subsumed under MMA):

RVP & FPR : Under 'Soil Conservation in the Catchments of River Valley & Flood Prone River (RVP & FPR)', since inception upto X Plan, an area of 65.27 lakh ha. have been treated. During 2008-09, about 2.90 lakh ha. area is targeted for treatment with estimated cost of Rs. 251.00 crore.

RADAS :The Programme for Reclamation of Alkali Soil(RAS) now named as' Reclamation and Development of Alkali & Acid Soil (RADAS)' is being implemented in the States; where alkalinity exists. Since inception upto X Plan an area of 6.59 lakh ha. has been reclaimed. During 2008-09, about 0.50 lakh ha. area has been targeted for reclamation with the estimated cost of Rs.20.00 crore.

SLUB : The State Land Use Board (SLUB) is a staff oriented programme and is being implemented in the all States & UTs. Under this programme since inception upto X Plan an amount of Rs 38.11 crore has been utilized. During 2008-09, Rs 3.50 crore is likely to be utilized for under taking various activities under SLUB.

II. Schemes/Programmes of RFS Division for development of degraded lands

The RFS Division is also implementing few programmes for development of degraded lands including rainfed areas. The main schemes and programmes of RFS Division are:

- (a) **National Watershed Development Project for Rainfed Areas (NWDPR)** – The National Watershed Development Project for Rainfed Areas (NWDPR) was launched in 1990-91 in 28 States and two Union Territories based on twin concepts of integrated watershed management and sustainable farming systems. Since inception upto the end of X Plan an area of 94.02 lakh ha. have been developed under the programme. During the XI Plan, it is proposed to develop about 30.00 lakh ha. covering about 5350 micro watersheds. For the year 2008-09, it has been targeted to cover about 4.00 lakh ha. with an estimated cost of Rs.276.53 crore.
- (b) **National Rainfed Area Authority (NRAA)** - The Union Government have constituted a National Rainfed Area Authority (NRAA) on 03-11-2006 to give focused attention to the problem of the rainfed areas of the country. The Authority is an advisory, policy making and monitoring body charged with the role of examining guidelines in various existing schemes and in the formulation of new schemes including all externally aided projects in this area. Its mandate is wider than mere water conservation and will cover all aspects of sustainable and holistic development of rainfed areas, including appropriate farming and livelihood system approaches. It would also focus on issues pertaining to landless and marginal farmers, since they constitute the large majority of inhabitants of rainfed areas.

NRAA has a two tier structure. The first tier is the Governing Board that will provide necessary leadership and appropriate coordination in implementation of programmes. The Governing Board is chaired by the Union Agriculture Minister and co-chaired by the Union Rural Development

Minister. The second tier is the Executive Committee consisting of technical experts and representatives from stakeholder Ministries. The Executive Committee is headed by the Chief Executive Officer and have five other full time technical experts. The Authority has been operationalised with the joining of Chief Executive Officer on 14-05-2007. Four out of five Technical Experts in the rank of Additional Secretary have been appointed in the NRAA. The recruitment of the remaining Technical Experts in the field of agriculture/horticulture is under process.

The NRAA has formulated common guidelines for Watershed Development Project and after approval of governing body of NRAA, the same has been circulated to all the States on 12th March 2008 for implementation of Watershed Development Programme as per instructions contained in the guidelines.

- (c) **Rainfed Area Development Programme (RADP) –** In the Budget speech of Union Finance Minister for the year 2007-08, a new scheme namely, Rainfed Area Development Programme (RADP) was announced. The Planning Commission has communicated the *in-principle* approval to the implementation of Centrally Sponsored Scheme of RADP at a cost of Rs.3500.00 crore during the XI Five Year Plan including a component of Rs.170.00 crore for NRAA on 20th March 2008. Based on the revised outlay of Rs.3330.00 crore as communicated by the Planning Commission and the comments received from various Ministries/Departments/Divisions of the DAC, the EFC Note has been revised and sent to the Ministry of Finance and Planning Commission. The EFC Note was discussed in a meeting chaired by Secretary (Planning Commission) on 4th August 2008. Based on the discussion, the EFC Note is revised and being sent to the Planning Commission for approval before it is placed to Expenditure Finance Committee. Under this programme, it is expected to cover 30 lakh ha. of rainfed area during the XI Plan period for the current year (2008-09) a Budget provision of Rs.348.00 crore has been made for implementation of the scheme.

4. Perspective Plan for Development of Degraded Lands during XI Plan

During XI Five Year Plan, an area of 32.05 million ha. with at an estimated cost of Rs 25848.00 crore has been targeted for development under various programmes. The Ministry-wise and Scheme-wise tentative target and outlay proposed for various Watershed Development Programmes for development of degraded lands for XI Five Year Plan are given in Annexure – III.

5. Formulation and Circulation of Operational Guidelines

The National Rainfed Area Authority (NRAA) has circulated Common Guidelines for Watershed Development Projects (CGDWP) for implementation of all Watershed Development Programmes in the country. According to the instructions contained in the CGWDP, the operational guidelines for the programmes, namely, NWDPR, RVP & FPR, RADAS, & SLUB have been circulated to the states for adoption. The Operational Guidelines for Watershed Development Programme in Shifting Cultivation Areas (WDPSCA) have been also formulated and submitted for consideration of IFD and Planning Commission before circulation of the same to the State Governments for adoption.

State-wise extent of various kinds of Land Degradation in India

(As per NBSS&LUP-ICAR-2005 on the Scale of 1:250,000)

(Area in thousand hectares)

S.N.	Name of the States	Water Erosion	Wind Erosion	Water Logging	Salinity/ Alkalinity	Soil Acidity	Complex Problem	Degraded Area	Geographical Area	Degraded Area(%)
1)	Andhra Pradesh	11518	0	1896	517	905	156	14992	27505	54.5
2)	Arunachal Pradesh	2372	0	176	0	1955	0	4503	8374	53.8
3)	Assam	688	0	37	0	612	876	2213	7844	28.2
4)	Bihar+ Jharkhand	3024	0	2001	229	1029	0	6283	17387	36.1
5)	Goa	60	0	76	0	2	24	162	370	43.9
6)	Gujarat	5207	443	523	294	0	1666	8133	19602	41.5
7)	Haryana	315	536	146	256	0	214	1467	4421	33.2
8)	Himachal Pradesh	2718	0	1303	0	157	0	4178	5567	75.0
9)	Jammu & Kashmir	5460	1360	200	0	0	0	7020	22224	31.6
10)	Karnataka	5810	0	941	110	58	712	7631	19179	39.8
11)	Kerala	76	0	2098	0	138	296	2608	3886	67.1
12)	Madhya Pradesh+ Chhattisgarh	17883	0	359	46	6796	1126	26210	44345	59.1
13)	Maharashtra	11179	0	0	1056	517	303	13055	30771	42.4
14)	Manipur	133	0	111	0	481	227	952	2233	42.6
15)	Mizoram	137	0	0	0	1050	694	1881	2108	89.2
16)	Meghalaya	137	0	7	0	1030	34	1208	2243	53.9
17)	Nagaland	390	0	0	0	127	478	995	1658	60.0
18)	Orissa	5028	0	681	75	263	75	6122	15571	39.3
19)	Punjab	372	282	338	288	0	0	1280	5036	25.4
20)	Rajasthan	3137	6650	53	1418	0	110	11368	34224	33.2
21)	Sikkim	158	0	0	0	76	0	234	710	33.0
22)	Tamil Nadu	4926	0	96	96	78	138	5334	13006	41.0
23)	Tripura	121	0	191	0	203	113	628	1049	59.9
24)	Uttar Pradesh+ Uttarakhand	11392	212	2350	1370	0	0	15324	29441	52.0
25)	West Bengal	1197	0	710	170	556	119	2752	8875	31.0
26)	Delhi	55	0	6	10	0	11	82	148	55.4
27)	Union Territories	187	0	0	9	0	9	205	825	24.8
Grand Total		93680	9483	14299	5944	16033	7381	146820	328602	
Grand Total(Million ha)		93.68	9.48	14.30	5.94	16.03	7.38	146.82	328.60	

Source : There are several estimates for the extent of degraded lands reported by various agencies in the country. These estimates vary largely due to variation in approaches and methodologies of estimation. In absence of comprehensive and periodic scientific surveys, the figures reported by National Bureau of Soil Survey & Land Use Planning, Nagpur based on studies and several estimates (2005) for various land degradation have been considered as logically concluded and are being used for various purposes.

**Degraded Lands Developed under various Watershed Development Programmes,
since inception upto Tenth Five Year Plan**

(Area in Lakh ha. and Expenditure in Rs. Crore)

S.No.	Ministry/Scheme and year of start	Progress since inception upto IX Plan		Progress during X Plan (2002-07)		Progress since inception upto end of X Plan*	
		Area	Expr.	Area	Expr.	Area	Expr.
(A) Ministry of Agriculture, (Department of Agriculture & Cooperation)							
1.	NWDPRA (1990-91)	69.79	1877.74	23.30	1147.82	93.09	3025.56
2.	RVP & FPR (1962 & 81)	54.88	1516.26	9.98	727.98	64.86	2244.24
3.	WDPSCA (1974-75)	2.58	166.27	1.35	129.31	3.93	295.58
4.	RADAS (1985-86)	5.81	76.39	1.30	45.35	7.11	121.74
5.	WDF (1999-00)	0.00	0.00	0.59	26.02	0.59	26.02
6.	EAPs	13.35	2039.81	4.80	1927.54	18.15	3967.35
	Sub Total	146.41	5676.47	41.32	4004.02	187.73	9680.49
(B) Ministry of Rural Development (Department of Land Resources)							
1.	DPAP(1973-74)	68.95	3284.74	68.32	1557.76	137.27	4842.50
2.	DDP(1977-78)	33.56	797.38	45.17	1152.50	78.73	1949.88
3.	IWDP(1988-89)	37.34	616.51	62.22	1821.64	99.56	2438.15
4.	EAPs	1.40	18.39	3.60	274.28	5.00	292.67
	Sub Total	141.25	4717.02	179.31	4806.18	320.56	9523.20
(C) Ministry of Environment and Forests							
1.	NAEP(1989-90)	0.70	47.53	0.00	0.00	0.70	47.53
Total (A+B+C)		288.36	10441.02	220.63	8810.20	508.99	19251.22

Abbreviations:

NWDPRA	-	National Watershed Development Project for Rainfed Area
RVP & FPR	-	River Valley Project & Flood Prone River
WDPSCA	-	Watershed Development Project for Shifting Cultivation Area
RADAS	-	Reclamation & Development of Alkali and Acid Soil
WDF	-	Watershed Development Fund
EAPs	-	Externally Aided Projects
DPAP	-	Drought Prone Area Programme
DDP	-	Desert Development Programme
IWDP	-	Integrated Wasteland Development Project
NAEP	-	National Afforestation and Eco-Development Project

Source: Working Group Report of Natural Resource Management for Eleventh Five Year Plan, constituted by Planning Commission, New Delhi, Feb., 2007.

Target and Outlay Proposed under various Watershed Development Programmes for XI Plan

Implementing Deptt./Ministry	Name of Scheme/ Programme	Target for XI Plan (Million ha.)	Outlay for XI Plan (Rs. in crore)
Department of Agriculture & Cooperation, MoA	NWDPRA	1.50	1500.00
	RVP & FPR	1.25	1500.00
	WDPSCA	0.20	240.00
	RADAS	0.10	100.00
	WDF	0.50	600.00
	EAPs	0.50	750.00
	RADP (Proposed)	3.00	3300.00
	Sub – total	7.05	7990.00
Department of land Resources, MoRD	IWDP		
	DPAP		
	DDP	24.00*	15358.00
	Sub Total	24.00	15358.00
Planning Commission	Hill Area and Western Ghat Development Programmes	1.00	2500.00
	Total for XI Plan	32.05	25848.00

* DDP, DPAP and IWDP have been merged together and named as Integrated Watershed Development Programme (IWDP).

