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World Hepatitis Day 2015

Hepatitis is the infection of liver and also refers to a group of viral infections that affect the liver. The most common causes of viral hepatitis are the five unrelated hepatotropic viruses Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, Hepatitis E. They are transmitted through different routes: Hepatitis A and E through contaminated food and water; Hepatitis B, through unsafe blood and other bodily fluids; Hepatitis C mostly through infections blood; and Hepatitis D serving as an additional infection in the presence of Hepatitis B. Viral hepatitis is the leading cause of liver cancer and the most common reason for liver transplantation. Worldwide 400 million people are living with hepatitis B or C. Every year 1.4 million people die from viral hepatitis and yet all of these deaths could be prevented. With better awareness and understanding of how we can prevent hepatitis we can eliminate this disease and save 4,000 lives a day.

Viral hepatitis can be prevented, but most people don't know how. That is why in 2010 the World Health Organization made World Hepatitis Day one of only 4 official disease specific world health days, to be observed each year on the 28th July. The date of 28 July was chosen for World Hepatitis Day in honor of the birthday of Nobel Laureate Professor Baruch Samuel Blumberg. Dr. Blumberg discovered the hepatitis B virus in 1967 and two years later developed the first hepatitis B vaccine and won the Nobel Prize. Millions of people across the world now take part in World Hepatitis Day, to raise awareness about viral hepatitis, and to call for access to treatment, better prevention programs and government action. Millions of people across the world now take part in World Hepatitis Day, to raise awareness about viral hepatitis, and to call for access to treatment better prevention programs and government action. The theme for World Hepatitis Day 2015 is prevention of viral hepatitis. Transmission of this virus can be prevented through better awareness and services that improve vaccinations, blood and injection safety, and reduce harm.

World hepatitis day is celebrated annually to encourage the common public for the early diagnosis, prevention and treatment from the hepatitis. Millions of the people have been affected worldwide with the acute and chronic hepatitis and getting died in large number every year. People get stimulated through the conduct of activities and know in detail about all the preventive and control measures of the hepatitis.

Based on the recent reports published by the Directorate of Health Services, Kerala, 834 patients were reported with Hepatitis A during the period January to June 2015 and 2 of them were died. The number of patients with Hepatitis B was found to be 563 and 13 of them were died during the same period. The lack of awareness about these infections is the major reason for the transmission of this infectious disease.

Prevention

Hepatitis infection can be prevented by providing safe food and water (hepatitis A and E), vaccines (hepatitis A, B, and E), screening of blood donations and provision of sterile injecting equipment and assuring infection control (hepatitis B and C). For Hepatitis A, Immunization of children (1-18 years of age) consists of two or three doses of the vaccine. Adults need a booster dose six to 12 months following the initial dose of vaccine. The vaccine is thought to be effective for 15-20 years or more. Safe and effective vaccines provide protection against hepatitis B for 15 years and possibly much longer. Currently, the Center for Disease Control and Prevention recommends that all newborns and individuals up to 18 years of age and adult participating at risk of infection be vaccinated. In many parts of the world, widespread infant vaccination programs have led to a decrease in new cases of hepatitis B. There is currently no vaccine to prevent hepatitis C, but reasearch is ongoing.

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Wastelands

Intorduction

Wasteland refers to barren or overgrown, uncultivatable desolate, devastated, ruined, unused, bleak, or neglected land. The non technical definition of wasteland is 'An empty area of land, especially in or near a city, which is not used to grow crops or built on, or used in any way and/or a place, time or situation containing nothing positive or productive, or completely without a particular quality or activity'.Excessive demand of land for both agricultural and non-agricultural uses has resulted in creation of vast stretches of wastelands such as degraded land, soil salinity, water logging, desertification, soil erosion etc., and the decrease in per capita cultivable land besides ecological imbalances. For sustainable development on earth, better management practices of natural resources especially land and water are essential. The increasing population pressure, urbanization and industrialization have put a great stress on our natural resources, resulting the decrease in agricultural area. Natural resources have been over exploited in order to provide the needs of increasing population for food and shelter which causes land degradation and ecological imbalance. So, there is an urgent need to identify and reclaim these degraded lands to meet the future demands of growing population.

Wasteland Classification and Definition

The Wastelands Atlas 2011 put together by the Ministry of Rural Development (MoRD) and National Remote Sensing Centre (NRSC) suggested the number of wasteland classes as 23 and 9 probable non-wasteland classes. The wasteland classification system for change analysis study consists of 23 wasteland and 9 non wasteland classes.

Wasteland Classes

1	Gullied and/ or Ravinous land (Medium)
2	Gullied and/ or Ravinous land (Deep)
3	Land with Dense Scrub
4	Land with Open Scrub
5	Waterlogged and Marshy land (Permanent)
6	Waterlogged and Marshy land (Seasonal)
7	Land affected by salinity/alkalinity (Medium)
8	Land affected by salinity/alkalinity (Strong)
9	Shifting Cultivation - Current Jhum
10	Shifting Cultivation - Abandoned Jhum
11	Under-utilised/degraded forest (Scrub domin)
12	Under-utilised/degraded forest (Agriculture)
13	Degraded pastures/ grazing land
14	Degraded land under plantation crop
15	Sands-Riverine
16	Sands-Coastal
17	Sands-Desertic
18	Sands-Semi Stab.-Stab>40m
19	Sands-Semi Stab.-Stab 15-40m
20	Mining Wastelands
21	Industrial wastelands
22	Barren Rocky/Stony waste
23	Snow covered /Glacial area

Non - Wasteland Classes

24	Built-Up
25	Industrial Area
26	Cropland
27	Fallow Land
28	Plantation
29	Forest (Dense/Open)
30	Forest Plantation
31	Grasslands
32	Waterbodies

I. Gullied and/ or Ravinous land :

They are the resultant of terrain deformation due to water erosion which occurs widely in all agro-climatic zones. Gullies are formed as a result of localized surface run-off affecting the unconsolidated material resulting in the formation of perceptible channels causing undulating terrain. They are mostly associated with stream courses, sloping grounds with good rainfall regions and foothill regions. These are the first stage of excessive land dissection followed by their networking which leads to the development of ravinous land. Ravines are basically extensive systems of gullies developed along river courses. Two categories of ravine lands are recognised.

(1) **Medium ravines** that having a depth of 2.5-3metres
(2) **Deep Ravines** having a depth of more than 5 metres.

II. Land with Scrub:

These areas possess shallow and skeletal soils, at times chemically degraded, extremes of slopes, severely eroded or subjected to excessive aridity with scrubs dominating the landscape. Based on the vegetation, two sub classes are identified

under this category:

(3) **Land with Dense Scrub** which constitutes more than 15% of vegetation. These scrublands are associated with moderate slopes in plains and foot-hills and are generally surrounded by agricultural lands.

(4) **Land with Open Scrub** which is same as dense except they possess sparse vegetation generally less than 15% or devoid of scrub. The land is generally prone to deterioration due to erosion and has a thin soil cover.

III. Waterlogged and Marshy land:

Water logged land is the land with soil pores within the root zones of the crops getting saturated with water. Surface water logged land is that land where the water is at/or near the surface and water stands for most of the year. Marsh is a land which is permanently or periodically inundated by water and is characterised by vegetation, which includes water and reeds. Depending on the duration of water logging period, it can be classified as

5. **Waterlogged/ Marshy land (Permanent),** in which the water logging duration is for at least 6 months or more in a year.

6. **Waterlogged/ Marshy land (Seasonal),** in which the water logging duration is less than 6 months in a year.

IV. Land affected by salinity/alkalinity :

The salt affected land is generally characterised as the land that has the adverse effects on the growth of plants due to the action or presence of excess soluble or excess exchangeable sodium. The salt affected land in the basin is located close to the coast due to the tidal action. Depending upon the degree of salinity these are categorised as

7. **Land affected by salinity/alkalinity (Medium),** which allows some scrub vegetation or salt- resistant crop during Kharif season. The Electrical Conductivity (EC) of these lands are between 8 and 30 (dS/m); pH 9-9.8 and Exchangeable Sodium Percentage (ESP) is between 15 and 40.

8. **Land affected by salinity/alkalinity (Strong),** which do not support any kind of vegetation and their EC level is more than 30, pH is more than 9.8 and ESP is more than 40.

V. Shifting Cultivation :

It is a cyclic process by which forests are slashed and burned to enable the cleared lands for cultivation by the tribes. In the imagery, shifting cultivation areas appear light yellow to brown in tone. The presence of vegetation gives spots of red tone and amidst such openings. Shifting cultivation areas are mostly found in the western and southern part, the basin in the mountainous tracts inhabited by tribal population. Two subclasses are identified

9. **Shifting Cultivation -Current Jhum ,** are areas that are used for cultivation by the process in the shifting cultivation which are clearly perceptible on the current season satellite image that are in pre-burnt/post-burnt condition.

10. **Shifting Cultivation - Abandoned Jhum,** which also includes under shifting cultivation, left idle for more than one year but less than 5 years thereby giving a scope for the regeration of secondary vegetation, especially bamboo or grasses.

11. **Under-utilised/degraded notified forest:** The land notified under the forest act and those lands with various types of forest cover in which denudation of vegetation is less than 20% of the canopy cover are classified as degraded land. In the basin the degraded land accounts for largest area. Extensive areas of degraded land are found in the notified forest areas.

12. **Agricultural land inside notified forest land:** These are the areas within the notified forest boundaries where regular agricultural activities are practised with Kharif, Rabi or seasonal crops.

13. **Degraded pastures/ grazing land:** These are areas lying in the non-forest areas whether or not they are permanently pastures or meadows, which have become degraded due to lack of proper soil conservation and drainage measures.

14. **Degraded land under plantation crop:** The land outside the notified forest areas subjected to degradation under plantation crops are mostly along the coast and on the foot hills which provide fuel and fodder.

15. **Sands-Riverine** : Riverine sands are sands that are seen as accumulations outside the main course of the river. These are composed of silt, sand and gravel deposited by streams but exposed as water level falls.

16. **Sands-Coastal :** These appear in light white to yellow with bluish to medium tone, vary in size with regular to irregular shapes smooth to mottled texture, contiguous and linear in pattern. It occurs in river beds, coastal onshore plain in association with shifting sand dunes, coastal beach sands, sand dunes and natural levees.

17. **Sands-Desertic:** Mostly these are located in deserts. Sands-Desertic wastelands are absent in Kerala.

18. **Sands-Semi Stab.-Stab>40m:** These are active sand dunal areas with semi stabilised to shifting sand dunes which are more than 40m high. Their shapes ans sizes vary depending upon the prevailing wind conditions. They rarely support vegetation.

19. **Sands-Semi Stab.-Stab 15-40m:** Sandy areas with stabilized to semi stabilized dunes of 15-40m high. Hardly and sparse vegetation in these areas.

20. **Mining Wastelands:** Large scale mining brings about the degradation of the land due to the accumulation of waste debris after extraction of required minerals.

21. **Industrial wastelands:** Industrial raw material or effluents or waste materials accumulated as a result of industrial operations whcich in turn causes the land degradation.

22. **Barren Rocky/Stony waste:** These are rock exposures of varying lithology, often barren and devoid of soil cover and vegetation. They occur amidst hill- forests as openings or scattered as isolated exposures on plateau and plains.

23. **Snow covered / Glacial area:** Areas under snow cover confined to the Himalayan region.

Change Analysis Results India

The Wasteland map 2008-09 and the wasteland change map from 2005-06 to 2008-09 is given in Figure 1 and Figure 2. The spatial extent of different classes of wastelands was 4,67,021 Sq. Km. in 2008-09, compared to 4,72,262 sq.km. in 2005-06 as shown in Table 1. It was observed that during this period, a total area of 32,340 Sq. Km. of different wasteland categories has changed into non-wasteland category. Bulk of the wasteland area of 2005-06 that underwent change was recorded under 'cropland' class (including fallow class) in 2008-09. A considerable area change has also been noticed getting converted into forest & forest plantations classes (9,600 Sq. Km.) during the period of study. Approximately 1300 sq.km area of additional water bodies was created in 2008-09 out of the wastelands of 2005-06. About 800 Sq. Km. of wasteland has been recorded as got converted into miscellaneous plantations. Among the wasteland classes, inter-class changes have taken place between snow covered/ glacial and barren rocky / degraded forest classes, gullied land and scrubland, scrubland and scrub dominant forest, shifting cultivation-current and shifting cultivation-abandoned, waterlogged-permanent and waterlogged- seasonal classes. During the same period, an area of 27,098 Sq. Km. of non-wasteland has been converted into different wasteland classes.

When category-wise change in the spatial extents of wasteland classes for the entire country was analyzed (Table 2), it was noticed that major change was observed with respect to 'snow / glacial' class, which increased by about 17,000 Sq. Km. in 2008-09. A similar increase of about 3,900 Sq. Km. was recorded with respect to 'seasonally waterlogged' class. Conversely, 'barren rocky / stony waste' and 'land with dense scrub' categories registered a marked decrease of about 9,600 Sq. Km. and 6,300 Sq. Km. in their spatial extents respectively in 2008-09, compared to 2005-06. 'Degraded forest (scrub-dominant)', 'semi-stabilised sand dunes (more than 40 m height)' are the other major classes that recorded significant reductions in their spatial extents during the period of this study. A general reduction in spatial extent has been observed in most of the other wasteland classes, during 2005-06 and 2008-09.

Figure 1 : Wasteland Map of India 2008-09

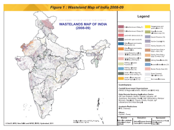

Figure2: Wasteland Change Map From 2005-06 to 2008-09

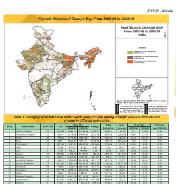

Table 1: Category wise total area under wastelands (sq.km) during 2008-09 vis-a-vis 2005-06 and change in different categories

Sl.No	State Name	No of Dist	TGA	Total WL		Change	Total Reduction	Total Increase	% to TGA		% Change over 2005-06
				2005-06	2008-09				2005-06	2008-09	
1	Andhra Pradesh	23	275068	38788.22	37296.62	-1491.60	1682.1	190.46	14.1	13.56	-0.54
2	Arunachal Pradesh	16	83743	5743.83	14895.24	9151.41	108.48	9259.88	6.86	17.79	10.93
3	Assam	23	78438	8778.82	8454.86	-324.15	862.56	538.05	11.19	10.78	-0.41
4	Bihar	37	94171	6843.09	9601.01	2758.92	1895.09	4654.41	7.26	10.2	2.93
5	Chattisgarh	16	135194	11817.82	11482.18	-335.64	379.06	43.15	8.74	8.49	-0.25
6	Delhi	1	1483	83.34	90.21	6.87	3.42	10.27	5.62	6.08	0.46
7	Goa	2	3702	496.27	489.08	-7.18	11.48	3.99	13.41	13.21	-0.19
8	Gujarat	25	196024	21350.85	20108.06	-1242.52	2858.99	1616.47	10.89	10.26	-0.63
9	Haryana	21	44212	2347.05	2145.98	-201.07	232.2	31.92	5.31	4.85	-0.45
10	Himachal Pradesh	12	55673	22470.05	22347.88	-122.17	197.35	75.17	40.36	40.14	-0.22
11	Jammu & Kashmir	14	101387	73754.38	75435.77	1681.38	1191.48	2872.78	72.75	74.4	1.66
12	Jharkhand	24	79706	11670.34	11017.88	-652.76	1183.5	531.16	14.64	13.82	-0.82
13	Karnataka	27	191791	14458.12	13050.62	-1407.5	1477.98	70.82	7.53	6.79	-0.73
14	Kerala	14	38863	2458.68	2445.62	-13.07	247.55	234.44	6.33	6.29	-0.03
15	Madhya Pradesh	48	308252	40042.98	40113.27	70.29	258.96	329.25	12.99	13.01	0.02
16	Maharashtra	35	307690	38262.81	37830.82	-431.99	469.93	38.22	12.44	12.3	-0.14
17	Manipur	9	22327	7027.47	5648.53	-1378.94	2391.1	1012.14	31.48	25.3	-6.18
18	Meghalaya	7	22429	3865.76	4127.43	261.67	93.86	355.13	17.24	18.4	1.17
19	Mizoram	8	21081	6021.14	4958.64	-1062.5	2669.27	1606.71	28.56	23.52	-5.04
20	Nagaland	7	16579	4815.18	5266.72	451.55	721.37	1172.6	29.04	31.77	2.72
21	Orissa	30	155707	16648.27	16425.76	-222.51	271.75	48.69	10.69	10.55	-0.14
22	Punjab	20	50362	1019.5	936.83	-82.67	112.7	30.58	2.02	1.86	-0.16
23	Rajasthan	32	342239	93689.47	84929.1	-8760.37	10264.6	1504.37	27.38	24.82	-2.56
24	Sikkim	4	7096	3280.88	3273.15	-7.73	11.83	4.29	46.24	46.13	-0.11
25	Tamilnadu	30	130058	9135.56	8721.79	-403.77	426.78	23.34	7.02	6.71	-0.31
26	Tripura	4	10486	1315.17	964.64	-350.53	486.15	135.07	12.54	9.2	-3.34
27	Uttarakhand	13	53483	12790.86	12858.53	69.47	440.35	509.86	23.91	24.04	0.13
28	Uttar Pradesh	70	240928	10988.59	9881.24	-1107.35	1268.71	161.08	4.56	4.1	-0.46
29	West Bengal	19	88752	1994.41	1929.2	-65.21	92.98	28.46	2.25	2.17	-0.07
30	Union Territory	8	9890	417.3	395	-22.3	27.34	4.68	4.55	4.32	-0.23
	Total	599	3166414	472201.54	467021.16	-5240.78	32340	27098.43	14.91	14.75	-0.17

Wastelands becoming Non-wastelands (-) 32340.28
Non-wastelands becoming Wastelands (+) 27098.43
* Un mapped areas (J&K) 120849.00
Total geographical area 3287263.00

Table 2 : Category wise total area under wastelands (sq.km) during 2008-09 vis-a-vis 2005-06 and change in different categories

Sl No	Category	Total WL			% TGA		
		2005-06	2008-09	Change	2005-06	2008-09	Change
1.	Gullied and/or ravinous land-Medium	7005.47	6145.96	-859.51	0.22	0.19	-0.03
2.	Gullied and/or ravinous land-Deep/very deep ravine	1714.80	1266.06	-448.74	0.05	0.04	-0.01
3.	Land with dense scrub	93372.62	86979.91	-6392.71	2.95	2.75	-0.20
4.	Land with open scrub	91645.83	93033.00	1387.17	2.89	2.94	0.04
5.	Waterlogged and Marshy land-Permanent	2532.46	1757.07	-775.38	0.08	0.06	-0.02
6.	Waterlogged and Marshy land-Seasonal	2994.22	6946.31	3952.09	0.09	0.22	0.12
7.	Land affected by salinity/alkalinity-Moderate	5451.63	5414.53	-37.10	0.17	0.17	0.00
8.	Land affected by salinity/alkalinity-Strong	1737.81	1391.09	-346.72	0.05	0.04	-0.01
9.	Shifting cultivation area-Current Jhum	5625.07	4814.68	-810.38	0.18	0.15	-0.03
10.	Shifting cultivation area-Abandoned Jhum	4608.44	4210.46	-397.98	0.15	0.13	-0.01
11.	Under utilised/degraded forest-Scrub dominated	85787.78	83699.71	-2088.08	2.71	2.64	-0.07
12.	Agricultural land inside notified forest land	16381.53	15680.26	-701.27	0.52	0.50	-0.02
13.	Degraded pastures/grazing land	7197.14	6832.17	-364.97	0.23	0.22	-0.01
14.	Degraded land under plantation crops	314.14	278.53	-35.61	0.01	0.01	0.00
15.	Sands- Riverine	2439.86	2111.96	-327.90	0.08	0.07	-0.01
16.	Sands- Coastal sand	719.31	654.47	-64.84	0.02	0.02	0.00
17.	Sands- Desert Sand	5280.07	3934.80	-1345.27	0.17	0.12	-0.04
18.	Sands- Semi-stabilized to stabilized (>40m) dune	11188.21	9279.75	-1908.46	0.35	0.29	-0.06
19.	Sands- Semi-stabilized to stabilized moderately high (15- 40m) dune	15627.63	14273.03	-1354.59	0.49	0.45	-0.04
20.	Mining Wastelands	506.58	593.65	87.07	0.02	0.02	0.00
21.	Industrial wastelands	63.99	58.00	-5.99	0.00	0.00	0.00
22.	Barren rocky area	69372.54	59482.29	-9890.24	2.19	1.88	-0.31
23.	Snow cover and/or glacial area	40694.80	58183.44	17488.64	1.29	1.84	0.55
	Total	**472261.94**	**467021.16**	**-5240.78**	**14.91**	**14.75**	**-0.17**

1. Gullied and/ or ravinous land (Medium)
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20. Mining Wastelands
21. Industrial wastelands
22. Barren Rocky/Stony waste
23. Snow covered /Glacial area

Change Analysis Results Kerala

Figure 3 shows Wasteland map of Kerala during 2008-09 and Wasteland Change Map from 2005-06 to 2008-09 is shown in Figure 4. The spatial extent of different classes of wastelands was 2445.62 sq. Km. in 2008-09, compared to 2458.73 sq.km. in 2005-06. It was observed that during this period, a total area of 247.55 Sq. Km. of different wasteland categories has changed into non-wasteland category. About 142.95 sq. km. of wasteland has been recorded as got converted into miscellaneous plantations. During the same period, an area of 234.44 Sq. Km. of non-wasteland has been converted into different wasteland classes. The details of inter-class area changes in different wasteland categories in Kerala during 2005-06 to 2008-09 are shown in Table 3.

Figure 3: Wasteland Map of Kerala 2008-09

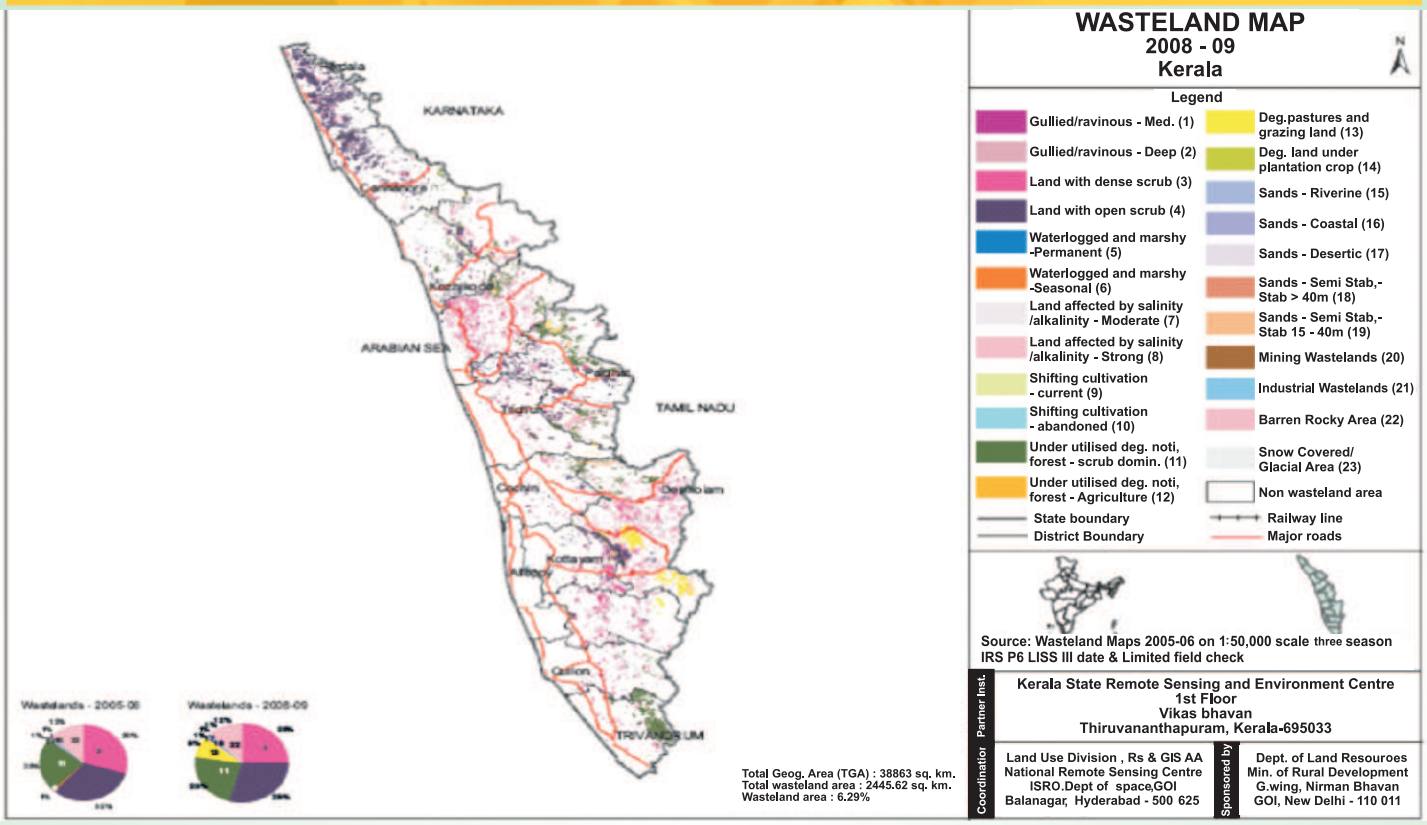

Figure 4: Wasteland Change Map From 2005-06 to 2008-09

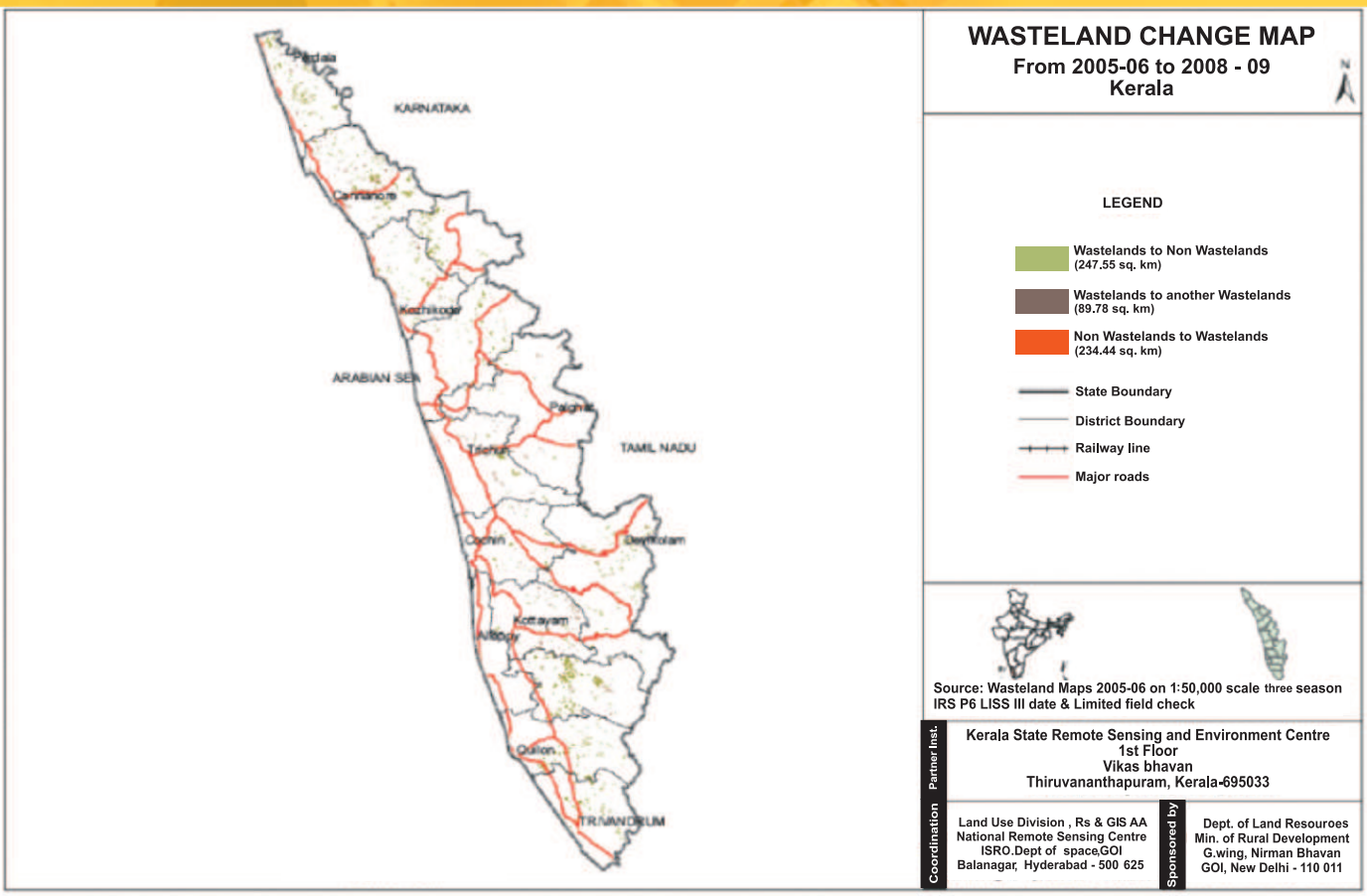

Table 3 : Change matrix showing inter class area change in different wasteland categories in Kerala during 2005-06 and 2008-09

WL Categories	WL during 2005-06 remaining as WL in 2008-09											WL 2005-06 becoming non-WL in 2008-09								(2005-06)	
	3	4	5	6	11	13	14	15	16	20	22	24	25	26	27	28	29	30	32	Category Total	Grant Total
3	570.56	36.95	--	--	--	--	0.03	--	--	3.08	--	1.82	0.19	1.03	--	66.20	--	44.21	1.44	**725.62**	
4	20.90	681.26	--	--	0.36	--	--	--	--	7.82	0.06	4.67	0.09	1.33	0.23	69.34	0.11	1.47	0.13	**787.78**	
5	0.09	--	2.05	--	--	--	--	--	--		--	--	--	1.44	1.48	--	--	--	--	**5.06**	
6	0.09	0.04	--	6.18	--	--	--	--	--		--	--	--	1.13	--	--	--	--	7.48	**14.91**	
11	--	--		--	541.88	--	--	--	--	0.05	0.58	--	0.82	--	--	3.92	2.60	22.37	0.04	**572.25**	
13	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	**--**	**2458.73**
14	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	**--**	
15	--	--	--	--	--	--	--	16.14	--		--	--	--	--	--	--	--	--	0.34	**16.48**	
16	--	--	--	--	--	--	--	--	20.03		--	8.59	--	0.02	--	--	--	--	0.02	**28.66**	
20	--	0.06	--	--	--	0.02	--	--	--	0.05	0.03	0.01	0.02	--	--	--	--	--	0.01	**0.20**	
22	17.87	--	--	--	--	--	--	--	--	1.65	283.26	0.03	0.09	0.37	--	3.49	1.00	--	--	**307.76**	
999	--	--	--	--	17.82	208.08	0.15	--	5.97	0.16	2.27	--	--	--	--	--	--	--	--		
Category Total (2008-09)	**609.50**	**718.32**	**2.05**	**6.18**	**560.05**	**208.10**	**0.18**	**16.14**	**25.99**	**12.91**	**286.20**	**15.13**	**1.22**	**5.33**	**1.71**	**142.95**	**3.70**	**68.06**	**9.46**		
Grand Total (2008-09)	**2445.62**																				

WL Category	Reduction from 0506 to 0809		Increase from 0506 to 0809	
	Area	No of polygons	Area	No of polygons
3	114.90	1539	--	0
4	77.38	883	--	0
5	2.92	6	--	0
6	8.61	108	--	0
11	29.74	186	17.82	7
13	-	--	208.08	6
14	--	0	0.15	3
15	0.34	6	--	0
16	8.63	24	5.97	7
20	0.05	3	0.16	1
22	4.98	55	2.27	24
Total	**247.55**	**2810**	**234.44**	**48**

Wastelands becoming Non-wastelands (-) 247.55	Green denotes Change from wasteland to non-wasteland
Non-wastelands becoming Wastelands (+) 234.44	Red denotes change from non-wasteland to wastelands
NET Decrease (-) 13.11	Blue denotes no change in the wasteland category
	Brown denotes class/ category change within wastelands

1. Gullied and/ or ravinous land (Medium)	13. Degraded pastures/ grazing land	**Non-Wasteland Classes**
2. Gullied and/ or ravinous land (Deep)	14. Degraded land under plantation crop	24. Built-up
3. Land with Dense Scrub	15. Sands-Riverine	25. Industrial Area
4. Land with Open Scrub	16. Sands-Coastal	26. Cropland
5. Waterlogged and Marshy land (Permanent)	17. Sands-Desertic	27. Fallow Land
6. Waterlogged and Marshy land (Seasonal)	18. Sands-Semi Stab.-Stab>40m	28. Plantation
7. Land affected by salinity/alkalinity (Medium)	19. Sands-Semi Stab.-Stab 15-40m	29. Forest-Dense/Open
8. Land affected by salinity/alkalinity (Strong)	20. Mining Wastelands	30. Forest Plantation
9. Shifting Cultivation - Current Jhum	21. Industrial wastelands	31. Grasslands
10. Shifting Cultivation - Abandoned Jhum	22. Barren Rocky/Stony waste	32. Waterbodies
11. Under-utilised/degraded forest (Scrub domin)	23. Snow covered /Glacial area	
12. Under-utilised/degraded forest (Agriculture)	999. Non-Wasteland Area	

The Table 4 (a-c) shows District-wise and category-wise distribution of wastelands (sq.km). during 2008-09 to 2005-06. When the wasteland statistics of different districts of Kerala were compared reduction trend was observed in as many as 7 district (Kollam, Kottayam, Kozhikkode, Pathanamthitta, Thiruvananthapuram, Thrissur and Wayanad) and a slight increase was noticed in the districts Malappuram and Palakkad. Kozhikkode recorded the largest decrease (17.33 sq.km) while Malappuram registered the highest increase (1.73 sq.km). The Reduction in the wasteland of kozhikkode is due to the reduction of land with open scrub, Under-utilised/degraded forest (Scrub domin) and also because of the reduction in the barren rocky/stony waste.

Table 4a: District wise and category wise distribution of wastelands (sq.km.)during 2008-09 vis a vis 2005-06

	Alappuzha			Kannur			Eranakulam			Idukki			Kasaragod		
WL class	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	8.91	11.96	3.05	21.15	14.01	7.14	259.6	217.32	-42.28	10.14	16.33	6.19
4	0.02	0.04	0.02	157.25	128.49	-28.75	10.81	11.58	0.78	48.11	53.04	4.93	290.88	259.77	-31.11
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	3.42	0.52	-2.9	-	2.9	2.9	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	17.07	7.63	-9.44	52.03	22.34	-29.68	29.33	57.17	27.84	0.42	0.42	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	2.75	2.75	-	-	-	-	169.11	169.11	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	1.3	1.66	0.36	2.31	2.41	0.1	1.42	1.59	0.17				5.25	5.15	-0.1
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	10.64	10.64	-	0.68	0.68	-	-	-	-	0.75	0.75
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	0.02	0.02	15.7	5.96	-0.74	15.13	6.13	-9.74	112.53	120.12	7.59	15.85	9.73	-6.12
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total WL	**1.32**	**1.72**	**0.4**	**201.24**	**169.84**	**-31.39**	**103.96**	**56.85**	**-47.11**	**449.57**	**619.66**	**170.09**	**322.54**	**292.15**	**-30.39**
TGA			**1414**			**2997**			**2408**			**5019**			**1961**

Table 4b: District wise and category wise distribution of wastelands (sq.km.)during 2008-09 vis a vis 2005-06

WL class	Kollam			Kottayam			Kozhikode			Malappuram			Palakkad		
	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	23.46	13.61	-9.85	63.08	61.02	-2.06	1.2	6.58	5.39	116.65	107.81	-8.84	33.64	31.86	-1.78
4	8.37	5.59	-2.78	47.55	46.4	-1.15	38.97	25.73	-13.24	1.85	1.93	0.09	131.79	128.77	-3.02
5	-	-	-	3.58	2.05	-1.53	1.48		-1.48	-	-	-	-	-	-
6	-	-	-	1.16	0.03	-1.13	0.16	0.03	-0.13	-	-	-	2.64	2.64	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	13.36	12.01	-1.36	4.46	5.8	1.35	33.21	28.91	-4.3	56.92	64.43	7.51	190.69	189.62	-1.07
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	2.83	2.83		0.59	0.59		2.46	2.46		9.06	9.06
14	-	0.15	0.15	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	2.52	2.61	0.09	9.47	7.05	-2.42
16	0.1	3.93	3.83				3.23	3.19	-0.04	3.56	3.53	-0.03			
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20					0.16	0.16	0.12	0.15	0.03						
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	0.47	0.48	0.01	0.68	0.6	-0.08	14.38	10.23	-4.15	21.66	21.96	0.3	89.64	90.09	0.46
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total WL	45.76	35.77	-10	120.51	118.89	-1.61	92.75	75.41	-17.32	203.16	204.73	1.58	457.87	459.09	1.23
TGA	**2583**			**2204**			**2345**			**3548**			**4392**		

Table 4c: District wise and category wise distribution of wastelands (sq.km.)during 2008-09 vis a vis 2005-06

	Pathanamthitta			Thiruvananthapuram			Thrissur			Wayanad			Total		
WL class	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change	2005-06	2008-09	Change
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	101.06	66.51	-34.55	14.3	8.31	-5.99	29.83	25.86	-3.98	42.61	28.33	-14.27	725.62	609.5	-116.12
4	7.44	12.69	5.25	4.96	3.18	-1.78	14.35	18.19	3.83	25.44	22.91	-2.53	787.78	718.32	-69.46
5	-	-	-	-	-	-	-	-	-	-	-	-	-5.06	2.05	-3.09
6	-	-	-	-	-	-	7.29		-7.29	0.24	0.05	-0.18	14.91	6.18	-8.73
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	0.45	0.45		145.43	145.63	0.2	14.69	14.47	-0.22	14.19	11.15	-3.04	572.25	560.05	-12.21
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-	13.23	13.23	-	0.3	0.3	-	3.74	3.74	-	4.02	4.02	-	208.1	208.1
14	-	-	-	-	0.03	0.03	-	-	-	-	-	-	-	0.18	0.18
15	-	-	-	-	-	-	4.49	6.48	1.99	-	-	-	16.48	16.14	-0.34
16				8.65	1.81	-6.84	2.88	2.72	-0.16				28.7	25.99	-2.71
17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	0.06	0.43	0.37	0.02	0.12	0.1	-	-	-	0.2	12.91	12.71
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	2.4	3.03	0.63	9.59	8.12	-1.48	7.16	7.08	-0.08	2.49	2.65	0.16	307.68	286.2	-21.49
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total WL	**111.35**	**95.91**	**-15.44**	**182.99**	**167.81**	**-15.19**	**80.71**	**78.66**	**-2.07**	**84.97**	**69.11**	**-15.84**	**2458.68**	**2445.62**	**-13.08**
TGA			**2642**			**2186**			**3032**			**2132**			**38863**

1. Gullied and/ or ravinous land (Medium)
2. Gullied and/ or ravinous land (Deep)
3. Land with Dense Scrub
4. Land with Open Scrub
5. Waterlogged and Marshy land (Permanent)
6. Waterlogged and Marshy land (Seasonal)
7. Land affected by salinity/alkalinity (Medium)
8. Land affected by salinity/alkalinity (Strong)
9. Shifting Cultivation - Current Jhum
10. Shifting Cultivation - Abandoned Jhum
11. Under-utilised/degraded forest (Scrub domin)
12. Under-utilised/degraded forest (Agriculture)
13. Degraded pastures/ grazing land
14. Degraded land under plantation crop
15. Sands-Riverine
16. Sands-Coastal
17. Sands-Desertic
18. Sands-Semi Stab.-Stab>40m
19. Sands-Semi Stab.-Stab 15-40m
20. Mining Wastelands
21. Industrial wastelands
22. Barren Rocky/Stony waste
23. Snow covered /Glacial area

Total - Total Wasteland Area
TGA - Total Geographical Area

The rapid industrialization and economic development in development in many countries have resulted in achievement of improved standards of living as evident from improved GDP per capita. In the population- rich countries with finite land resources, agricultural natural resource security is of utmost importance. Further, because the crop yields and productivity of the favoured agricultural regions' have platued out, it is essential that the degraded and wasteland are rehabilitated and rejuvenated so that such lands are rendered cultivable and may become effective in supporting food crop production,agroforestry and forestry- based land - use systems. Further, global environmental change and variability are forcing irreparable damage to the arable lands adjoining degraded lands, water and biodiversity resources. These would have serious consequences on food production and food security in the coming years.

Sources

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Events

World Environment Day 2015

Kerala State Council for Science Technology and Environment (KSCSTE) observed World Environment Day 2015 on June 5th at Science and Technology Museum, Thiruvananthapuram colourfully with various activities. The theme for this year was Seven Billion Dreams. One Planet. Consume with Care.' KSCSTE conducted Painting and Photography completion in connection with WED 2015.

The WED 2015 was inaugurated by Dr Suresh Das, Executive Vice President, KSCSTE. Prof. George Varghese, Director and Member Secretary in charge, KSCSTE presided over the function. Dr. Kamalakshan Kokkal, Joint Director and Scientist F, KSCSTE welcomed the gathering. Dr Suresh Das, EVP, KSCSTE said that Science and Technology innovation would help us to reduce over dependence on natural resources. In order to achieve sustainable development, the environmental protection should be given proper attention. Over population is a serious problem and careful management of resources is the need of the hour. The felicitation was given by Smt. Sreelatha, Joint Director, Science and Technology Museum. Dr P Harinarayanan Scientific officer KSCSTE extended the vote of thanks during the programme.

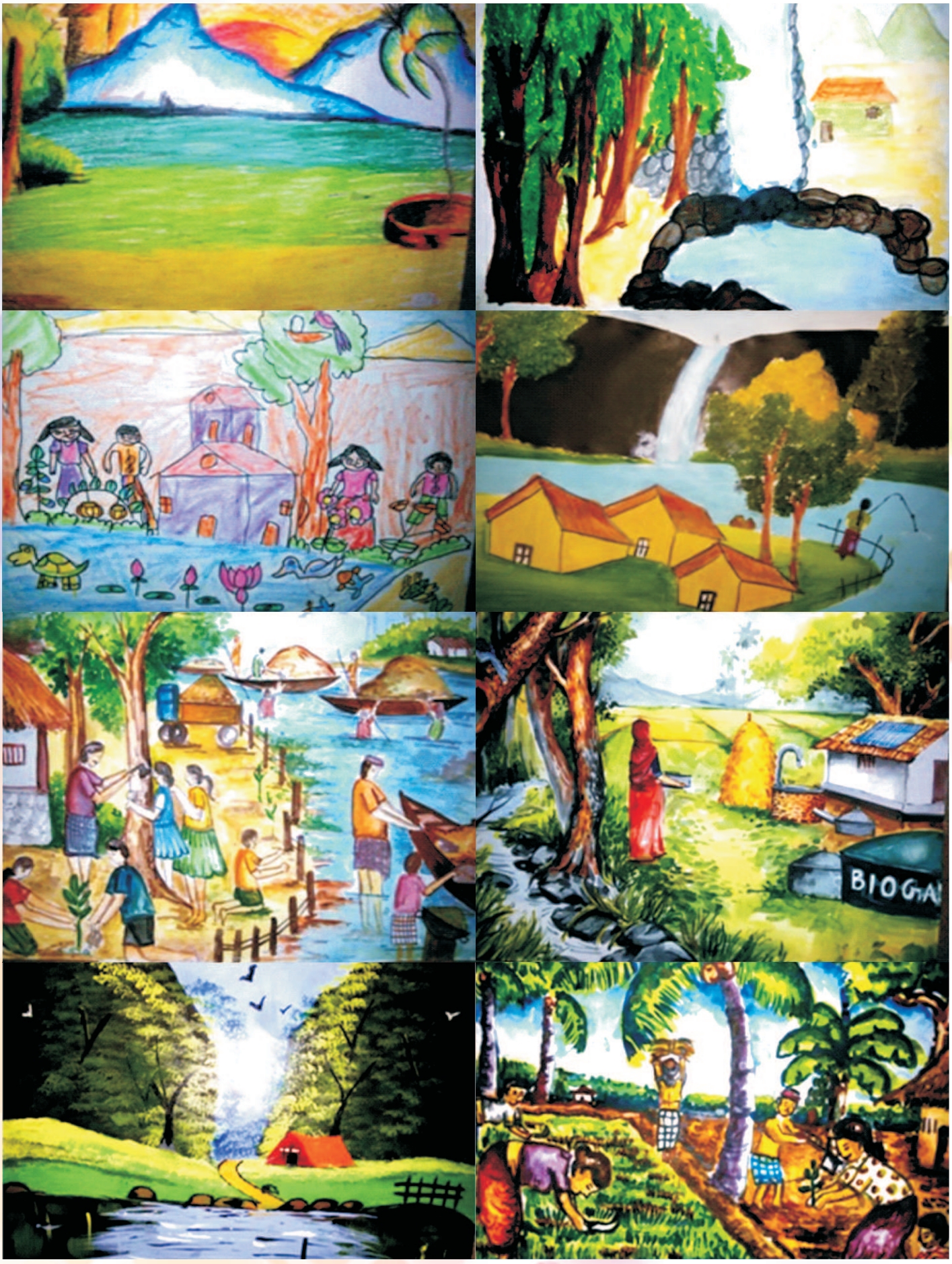
Dr Oommen V Oommen, Chairman, Kerala State Biodiversity Board in his key note address given the significance of World Environment Day 2015 and spoke about the importance of the Natural Resource of Kerala. He said that wastage of food is a serious problem. About 200 million suffers due to lack of good quality drinking water. The ill effects of climate change will worsen the situation. Hence serious attention should be made to overcome such difficulties.

The Executive Vice President, KSCSTE released a study project report on "Environmental Monitoring Programme of Water Quality 2015"brought out by KSCSTE. He also distributed cash prizes and certificates to the winners of National Photography Competition and Painting Competition. An exhibition of best selected photos and paintings were also arranged.

Dr P.N. Premachandran, Former Director, Soil Survey , Govt of Kerala spoke about the International Year of Soils 2015 during his technical session and Dr. P.S. Harikumar explained the about the recently released Water Quality Monitoring Report 2015.

Painting Competition

Prize Winning Paintings


BIOGA

Customised Hands- on Training Programme

Two day Customised Hands- on Bhuvan Training Programme for ENVIS Centres was conducted by the National Remote Sensing Centre (NRSC), at Hyderabad on 28th and 29th July, 2015. Twenty five paeticipants from 23 ENVIS Centres were participated for the training programme. The training Programe was very useful for creating and disseminating data/ content relating to the themes assigned to ENVIS Centres in geo-spatial platform in Bhuvan portal. Senior Scientists from NRSC, ISRO demonstrated how Bhuvan portal resources could be used for enriching the content of ENVIS websites. It is emphasized that feautres of Bhuvan portal may be used by State and Thematic ENVIS Centres for further dissemination of information.

International Day for the Preservation of the Ozone Layer

The United Nations' (UN) International Day for the Preservation of the Ozone Layer is celebrated on September 16 every year. This event commemorates the date of the singning of the Montreal Protocol on Substances that Deplete the Ozone Layer in 1987. This year marks the 30th anniversary of the Vienna Convention for the Protection of the Ozone Layer, an important milestone in the production of the ozone layer. The theme for the celebration of the anniversary and this year's International Day for the Preservation of the Ozone Layer to be Marked on 16 September is **"30 Years of Healing the ozone Together ." The theme is Support by the slogan, "Ozone: All there is between you and UV."**The theme celebrates the collective efforts of the parties to the Vienna Convention and the Montreal Protocol in protecting the ozone layer over the past three decades, and the supporting slogan highlights the importance of the ozone layer in protecting life on Earth from the harmful effects of UV radiation.

Kerala State Counil for Science, Technology and Environement (KSCSTE) invited proposal for the observance of Ozone Day from Research Organisation, Govt./ Aided College, Polytechnics, R&D Centres of the council, Govt./ Aided Schools, Universities and Departments and NGC District Co-ordinators. 135 Proposals were selected for financial assistance after screening by an expect commette

Environmental News

Kerala

Bamboo whisper' for conservation (Source: 02-06-2015, The Hindu)

As part using its watershed management programmes for conservation activities, the Balussery block panchayat has launched a project under which bamboo saplings will be planted on the banks of various rivers.The project, 'Puzhakal Marikkunnilla; Theeravum,' will enlist the cooperation of workers under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).The drive will also cover rivulets coursing through the panchayat.Officials said three varieties of bamboo would be used. The project would be implemented with the cooperation of the Agriculture Department.The Kerala Forest Research Institute, Peechi, would supply the saplings, they said.The Poonoor river banks will get special focus.The Unnikulam grama panchayat will play a lead role in mobilising workers and completing the work.The Balussery block panchayat drew inspiration from a similar project of the Centre for Water Resources Development and Management (CWRDM) implemented for the conservation of the Mampuzha river.The Peruvayal panchayat had cooperated with the project.The CWRDM too had sought the support of MGNREGS workers to complete the work on a three-km stretch, along the bank. The saplings were purchased from the KFRI.

Missing trees on the coastline (Source : The Hindu, 06 - 09 - 2015)

A few plant species, once found in abundance along the west coast, especially the coastal belt of Kerala, have become locally extinct. A few plant species, once found in abundance along the west coast, especially the coastal belt of Kerala, have become locally extinct, raising concerns about the changing micro - habitat and ecology of the region, *Pemphis acidula*, a small tree, and *Nypa fruiticans*, a medium -

sized palm are among the habitat specific species that have vanished from the Kerala coast. While *Nypa fruitcans* , locally known as Njettipana, was mentioned in the classic text book Hortus Malabaricus, which describes the medicinal plant properties of the flora in Kerala. There were references to *Pemphis Acidula* in the book Floora of Presidency of Madras by J.A .Gamble during the 1920s. *P. acidula* species was locally described as Coastal Iron wood in English and Kuredhi in Dwivehi language. It was reported that *P. acidula* was found common in sea coast and tidal backwaters in Malabar , Travancore and Tinnevally. Recently, the reserchers from KFRI located the plant in Olhugiri and Rasgatheemu Islands for alien invasive species. The International Union for Conservation of Nature (IUCN) have assessed that the population of the species, which has a wide distribution pattern in coastal region, is "declining in some region due to habitat loss and collection for use in the bonsai trade."

India

India has 988 species on IUCN ' Red List'

(Source: 21- 04-2015, The Hindu)

India has added 15 more species to the "Red List" of threatened species published by the International Union for Conservation of Nature (IUCN) in 2014, but the country has climbed down a spot to the seventh position. By the Year end, India has 988 threatened species on the list, which lists critically endangered, endangered and vulnerable species. In 2013, the number was 973. With 659 species in 2008, the increase over seven years is 50 percent, in part due to better reserch identifying more threatened species and deforestation. By adding 37 species, China seemed to have helped India improve its rank. A part from habitat loss, it is research and surveys that add species to the 'Red List' . Studies for some endemic species are yet to the conducted in India, to give a better picture of their status," said P.O.Nameer South coordinator, in situ, Conservation Breeding Specialist Group, Species Survival Commission, IUCN. This is definitely a concern. There is tendency of decision -makers to focus on charismatic mammals for conservation, while others are left out of programmes. A more holistic approach is needed to conservation in India." A recent World Bank mapping of endangered mamals shows India as having the fourth largest number of threatened species in the world, 31 of them endemic to the region.

Pollution : Particulate matter in India higher than WHO limit (Source: 07-05-2015, The Hindu)

In 2010, air pollution killed nearly 600,000 people in India, according to the World Health Organisation (WHO). The situation has not changed in the last five years. A recent study shows that a significant population of Indian subcontinent breathes air with much higher particulate matter that is lesser than 2.5 micrometre (PM2.5) in size than the limit set by the WHO. Outdoor air pollution as a whole, especially the particulate matter, has been declared as class-1 cancer-causing agent (carcinogen) in 2013 by the International Agency for Research on Cancer (IARC), which is part of the WHO. Besides, it causes other respiratory and heart diseases. The PM2.5 is particularly dangerous and can cause adverse health effects owing to its greater penetrability into the human respiratory system and eventual accumulation in human organs and blood. Rural women, children and elderly population are more prone to diseases caused by air pollution. Rural women, in particular, face a greater risk from indoor pollution - locally made mud stoves fuelled by solid biofuel emit a far greater amount of finer particulate matter. Air quality of any area depends on local emissions, long-range transport, local and regional weather patterns, and to some extent the topography of the region. Due to increased buoyancy and efficient ventilation in summer, pollution plumes rise effortlessly to the free atmosphere. This leads to a reduced level of surface level PM2.5 concentration in our breathing zone. The problem gets aggravated during winter. Adverse conditions during winter help trapping of pollution leading to elevated level of surface PM concentration.

World

Rare 'Supermoon' lunar eclips on Sunday

(Source: 24 -09-2015, The Deccan Herald,)

The last such event, when a total lunar eclipse coincided with a 'Supermoon' occurred 33 year ago , and it has happened only four times in the last 115 years. A super blood moon'only happens during a Lunar Eclipse and when the moon is at its closest point to the Earth in its orbit . As the moon passes into the shadow of the Earth, it takes on a deep -red colour due to the only sunlight reaching it being refracted through the planet's atmosphere. Civilisations throughout the ages look at this celestial rarity as an ominous sign of an apocalypse. So, what does a Supermoon really mean? It only means

the moon looks a bit bigger than its usual size, since it's a bit closer to the earth than otherwise .Because the orbit of the moon is not a perfect circle, the moon is sometimes closer to the Earth than at other times during its orbit ,NASA scientis Noah Petro said in a statement. There's no physical difference in the moon , ' Petro added . " it's about 14 per cent larger than normal, NASA reports. What is uncommon is for a total lunar eclipse to coincide with a Supermoon. There have been just five such events since 1900 (in 1910,1928,1946,1964 and 1982) NASA said.

Plastic - eating worms may offer solution to mounting waste, researchers discover

(Source:30-09-2015 The Hindu,)

Mealworms munch on Styrofoam,a hopeful sign that solution to plastic pollution exist. Wei -Min Wu, a senior reserch ensearch engineer in the Department of Civil and Environmental Engineering, discovered the larvae can live on polystyrene. Consider the plastic foam cup. Every year, Americans throw away 2.5 billion of them. And yet, that waste is just a fraction of the 33 million tons of plastic American discard every year. Less than 10 percent of that total gets recycles, and the reminder presents challenges ranging from water contamination to animal poisoning, Enter the mighty mealworm . The tiny worm, which is the larvae form of the darkling beetle,can subsist on a diet of Styrofoam and other forms of polystyrene, according to two companion studies co- authored by Wei - Min Wu, a senior reserch engineer in the Department of Civiland Environmental Engineerin at Stanford.Microorganisms in the worms guts biodegrade the plastic in the process a surprising and hopeful finding. Our findings have opened a new door to solve the flobal plastic pollution problem," Wu said. The papers,published in Environmental Science and Technology, are the first to provide detailed evidence of bacterial degradation of plastic in an animal's gut. Understanding how bacteria within mealworms carry out this feat could potentially enable new options for safe management of plastic waste.

Bibliography

Title : Species Abundance Distributions of Selected Communities in the Myristica swamp forests of Southern Kerala

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Abstract : The species abundance distribution (SAD) utilizes all the information gathered in a community and is the most complete mathematical description of the data. Myristica swamp forests are an endemic, highly fragmented ecosystem, naturally restricted due to systematic destruction and the special abiotic conditions required for their survival. Species diversity of amphibians, reptiles and trees in the Myristica swamp forests of southern Western Ghats in Kerala was documented using standard protocols for two years. Conventional species abundance distribution models could not be fitted into the datasets of this study. Graphical representations of the distribution of the dataset suggest that existence of multiple peaks on a log scale does not reject the universal hollow curve law on the arithmetic scale, but it will reject all SAD models producing unimodal curves. Various studies using SAD as a tool for community and ecosystem studies were reviewed and it was found that the presence of many species of intermediate abundance and decrease in rare species in our datasets could be an indication of natural distributions moving apart under disturbance and enrichment. Deconstruction and identification of resident and transient groups was done. We suggest that the Myristica swamps, which are situated in an area with high potential for rare species, may be in a transition due to disturbance and fragmentation. Ground truthing and previous studies already indicate these swamp forests as highly fragmented and disturbed.