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NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

NATIONAL DOCUMENTS RELEVANT TO THE MAJOR NBSAP THEMES: Cross-referencing to Pertinent Sections

Members of the Technical and Policy Core Group (TPCG) of the NBSAP have reviewed a number of national level documents related to environment and biodiversity, for their relevance to the NBSAP process.

The documents reviewed were:

1. National Report on Implementation of Article 6 of the Convention on Biological Diversity, 1998
2. National Policy and Macrolevel Action Strategy on Biodiversity, 1999
3. Environment Action Programme (EAP) 1993
4. National Conservation Strategy and Policy Statement on Environment and Development 1992
5. National Forestry Action Plan 1999 (NFAP)
6. Biodiversity Conservation Prioritisation Project (BCPP) reports, 1999
7. Reports of the International Development Research Centre on medicinal plants

A background and overview is given in the TPCG note: Assessing Existing National Documents Relevant To NBSAP: A Synthesis of the Findings (which is available in the Inaugural National Workshop compendium of papers, and can be requested separately).

This document provides a first-cut listing of the sections and chapters of each of these documents that are relevant to each of the major themes of the NBSAP. This will hopefully be useful to the Thematic Working Groups (TWGs), but also to various other executing agencies of the NBSAP process.

This is only a preliminary version, more will be added, and given to the TWGs and other agencies, as and when further assessments are done.

[This compilation has been done by Kanchi Kohli, based on the reviews undertaken by various TPCG members]

1. Economics and Valuation of Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Direct mention is made in the report.
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Natural Resources Accounting' theme
3	National Policy and Macrolevel Action Strategy on Biodiversity•	Part IV, (4.7) People's Participation; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development, 1992	
5.	National Forestry Action Plan (NFAP), 1999♣	NFAP Vol. II section1.4

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

b) Structural Properties

Many of the nuclear H II regions are spatially resolved. As an illustration of the variety of structures and luminosities observed in our sample, Fig. 4 [Plate 60] shows Hα + [N II] images of the central disks of three spiral galaxies with H II region nuclei, NGC 275, NGC 2276, and NGC 7714. Also shown for comparison is the central region of the hotspot galaxy NGC 4321 (the structure of the hotspot region is shown in Fig. 1). The bars in each panel indicate a linear dimension of 2 kpc. NGC 275 is an example of a galaxy with a semiresolved H II region nucleus (indicated by the arrow), whose luminosity is quite low in comparison to many of the H II regions in its disk. In NGC 2276 the nucleus is brighter, comparable in luminosity to the brightest disk H II regions, and is noticeably extended in structure. NGC 7714 contains the prototype example of a starburst nucleus (Weedman *et al.* 1981). The nuclear emission extends over a 2 kpc region, with a total luminosity that dominates the integrated emission of the galaxy. In NGC 4321 the nuclear-emission region is resolved into a central nucleus and circumnuclear hotspots, but it is easy to see that if the galaxy were farther away the hotspots would not be resolved.

Although two-dimensional photometry is available for a considerable number of H II region nuclei in our sample, mostly from Keel (1983c) and Keel *et al.* (1985), accurate diameters are difficult to measure, because most of the nuclei are so distant that they are strongly affected by seeing. The high stellar background also makes it difficult to define reliable isophotal diameters at the faint levels which are normally applied to disk H II regions. We have measured diameters at the half-peak and 10% levels (not isophotal diameters) for the nuclei with available Hα images, using an approximate (Gaussian) seeing correction. The FWHM sizes range from 100–800 pc when multiple complexes can be separated, and faint emission can be traced over a typical extent of 1–2 kpc overall. These dimensions are comparable to sizes of disk H II regions of comparable luminosity measured by Kennicutt (1979, 1988). The similarity in Hα luminosities and sizes implies that the Hα surface brightnesses are also comparable. A more detailed comparison cannot be performed reliably with the available data.

Most of the hotspots are considerably more compact than disk H II regions of comparable luminosity. In the galaxies we studied, the entire hotspot region has a typical extent of 500–1500 pc, comparable to the diameters of the largest single H II regions in spiral disks. The individual hotspots are only marginally resolved, and are separated by a few seconds of arc, or a few hundred parsecs at most. The hotspots also exhibit significantly higher peak surface brightnesses than most bright disk H II regions. We compared the peak Hα intensities of the hotspots in our sample with a comparison sample of 15–20 H II regions in the disks of each galaxy, and found that the hotspots are approximately 4 times brighter on average (this factor is somewhat dependent on whether the bright Hα background in the hotspot regions is included).

The apparent compactness of the hotspots may be partially a selection effect, reflecting their crowded environment. Contour maps generated from our CCD images show that the hotspots are actually bright cores within a region of Hα emission that fills the central 1–2 kpc of the galaxies. This structure is very similar to that of the multiple-core giant H II region complexes in M101 and other nearby spiral galaxies. The two largest complexes in M101, for example, NGC 5471 and NGC 5462, contain several bright knots i bedded in a halo which extends over approximately 1 k (e.g., Kennicutt 1984). On the other hand, the unusua high surface brightness of the hotspots cannot be a selecti effect; this indicates that the average density of the gas substantially higher than in most bright disk H II regions. a result, the individual hotspots tend to be considerab brighter than the cores inside large disk complexes such NGC 5462. The brightest hotspot cores often have lumino ties that are comparable to entire complexes in the disk. the optical extinction in the hotspots is systematically high than in disk H II regions, as seems likely, then these diff ences are even more pronounced.

Measurements of the density-sensitive [S II] doublet 6717–6731 Å are available for 30 H II region nuclei and disk H II regions, and the distribution of [S II] flux rati and corresponding electron densities is shown in Fig. 5 (r tios with quoted uncertainties of 25% or higher were n plotted). The density conversion is based on the comput tions of Blair and Kirshner (1985). Many of the objects e hibit doublet ratios that are very close to the low-densi limit ($r \approx 1.4$). The [S II] ratio is only weakly dependent density for $r > 1.3$, so the corresponding densities in th range are very uncertain.

The disk H II regions show a strong concentration points near the low-density limit, indicating densities of o der 10–100 cm^{-3}, with the remainder in a tail extending densities of a few hundred cm^{-3}. Several of the nuclei also l near the low-density limit, but most fall within a broad di tribution with $Ne = 100$–$1000\ cm^{-3}$. Thus the nuclear H regions tend to possess higher densities on average, wit both classes of objects showing a large range of densitie Measurements of [S II] are only available for five hotspo (these are indicated with crosses in Fig. 5), and these are n sufficient to reveal any general trends; two objects are at below the low-density limit, while three others have densiti of order 100 cm^{-3}.

The extinction-corrected Hα luminosities and electr densities can be combined to estimate the H^+ masses of th H II region nuclei (also see Stauffer 1982). The derive masses show a large range, from 10^3 to $10^7\ \mathcal{M}_\odot$, with a average of approximately $10^5\ \mathcal{M}_\odot$. Again, these values a very similar to those observed for giant H II regions in th disks of S-Irr galaxies (Kennicutt 1984). The ionized g masses derived for the nuclei are subject to large uncertai ties, due to possibly large internal variations in density an extinction, so a more detailed comparison of the masses wit disk H II regions is not warranted.

One final quantity of interest is the clumpiness or fillin factor of the H II regions, because if this parameter is signif cantly different in the nuclei it may introduce systemat effects in their forbidden-line spectra. The volume-fillin factor can be estimated directly if both the forbidden-lin densities and Hα surface-brightness distributions a known, but unfortunately the nuclei are not sufficiently r solved for this to be performed. Crude limits on the fillin factors can be set if we assume that the nuclear H II region possess diameters of the same order as disk H II regions (i.e a few hundred parsecs, see above). In that case, the observe peak emission measures yield rms electron densities of orde 10–100 cm^{-3}, and volume filling factors ranging from 10^{-} to a few times 10^{-2}. Giant H II regions in the disks are gene ally characterized by filling factors of order 0.01–0. (O'Dell and Castenada 1984; Kennicutt 1984). Hence th

2. Livelihood, Lifestyles and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India	Traditions and lifestyles pertaining to conservation- p. 1; Direct mention of livelihood issues is made of in the report.
2.	Environment Action Programme (EAP) - 1993	EAP's 'Forestry' and 'Alternative Energy Action Plan' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity.*	Part IV, (4.5) Sustainable Utilisation; (4.6) Indigenous Knowledge Systems, Innovations and Practices, and Benefit Sharing; (4.7) People's Participation; (4.11) International Cooperation. Chapter 1 (Pg 4-9) Food security status of tribals. Chapter II, v.v., (in situ and ex situ conservation of medicinal plants Chapter XI, point 9 (need to check over-harvesting of wild plants, need for identification of threatened species, NTFP policies that would make cultivation remunerative.) Chapter IV, 4.5, (sustainable use of bio-diversity of the medicinal plants)
4.	National conservation strategy and policy statement on environment and development, 1992	3.4 Conservation of Forest and wildlife: adoption of a new Forest Policy (1988), stringent provisions under FCAct'80, preparation of NFAP, establishment of NPs, sanctuaries, bioreserves. 4.3 and 4.4. Agenda for action and Instruments for action.* 5.2.3 Biodiversity: Full and correct rehabilitation of rural poor/tribals displaced due to the creation of national parks/biosphere reserves/tiger reserve. 5.2.4. Biomass 6.0 Development Policies from Environmental Perspective (6.3 Forestry)
5.	National Forestry Action Plan, 1999*	NFAP Vol. II-section2.4 (partial coverage)
6.	Implementation of article 6 of the Convention on Biological Diversity in India - National Report	Executive Summary /points 15, 16, 20 and 21/ Sec. 2.14, 2.63 (medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).

3. Health and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Listing of texts with reference to medicinal plants- page. 41
2.	Environment Action Programme	None

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* The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

* There is a listing on pages 11-12 of the policy statement.

* Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned for the NFAP like gender in forestry could as well be used by NBSAP TWGs.

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	(EAP) – 1993	
3	National Policy and Macrolevel Action Strategy on Biodiversity•	Part IV, (4.7) People's Participation; (4.11) International Cooperation. Sec.1.2 (need for bio-diversity conservation in the context of medicine and health needs. Chapter IV, 4.2.1, (base-line data of species and the genetic diversity. Can be applied to medicinal plants too. 4.2.2, (process of preparation of the red data books needs to be speeded up and validated.[1] 4.3.1, (medicinal plants in the in situ conservation programme, in southern India. 4.4.1, (community gene banks especially in the context of medicinal plants) 4.5, (sustainable use of diversity of medicinal plants)
4.	National conservation strategy and policy statement on environment and development, 1992	Covered
5.	National Forestry Action Plan, 1999♣	
6.	Implementation of article 6 of the Convention on Biological Diversity in India - National Report	Executive Summary /points 15, 16, 20 and 21/ Sec. 2.14, 2.63 (medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).
8.	The role of medicinal plants industry in fostering biodiversity conservation & rural development (IRDC)	Articles on the medicinal plants industry
9.	The medicinal plants sector in India (IDRC)	Cultural and historical context of medicinal plants and traditional systems of medicine. Limited information on local trade in medicinal plants.
10.	Tribal folk medicinal plant resources of South Asia (IDRC)	Articles and talks on different aspects of tribal and folk knowledge of medicinal plants

4. Culture and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Traditions of conservation- page. 1
2.	Environment Action Programme (EAP) - 1993	None
3.	National Policy and Macrolevel Action Strategy on Biodiversity•	Part IV, (4.7) People's Participation; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development, 1992.	5.2.3 Biodiversity: Emulation and support for protecting traditional skills and knowledge for conservation
5.	National Forestry Action Plan, 1999♣	None?

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[1] This applies to medicinal plants because the methods currently used by BSI are definitely inadequate

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conclusions, but it is still possible to get a fair idea of the range of possibilities.

Laurent-Muehleisen et al. (1993) have observed a sample of 15 X-ray selected BL Lacs(XBL), which were discovered in the identification of X-ray sources discovered in the HEAO 1 Large Area Sky Survey. The BL Lacsin the sample had redshift in the range $0.028 < z < 0.698$. It was found that 80 percent of the sources showed extended morphology and were of the one-sided, head-tailed, double-lobed or amorphous type. Perlman & Stocke (1993) have found a similar morphologies for another X-ray selected sample of BL Lacsfrom the Extended Medium Sensitivity Survey (EMSS, see Section 6.4), and for radio selected BL Lacsincluding some from the 1 Jy sample of Stickel et al. .

The mean extended radio power of BL Lacobjects is found to be similar to that of FR I radio galaxies. Amongst the BL Lacson the whole there are fewer double sources and more amorphous sources than are found in samples of FR I galaxies. Superluminal motion has been found in several BL Lacs(see Section ??) and they exhibit high variability. All these factors are consistent with BL Lacsbeing FR I radio galaxies viewed end on, which will make the apparent sizes smaller and the structures amorphous. A detailed comparision (see e. g. Laurent-Muehleisen et al. 1993) shows that core radio power increases from FR I galaxies to X-ray selected BL Lacs(XBL) to radio-selected BL Lacs(RBL) and the ratio of core-to-extended radio power also increases in the same direction. From comparision of X-ray selected and radio selected BL Lacpopulations, it has been observed that the XBL have lesser variability in total and polarized light. They have a lesser degree of polarization and the polarization position angle often remains constant. These facts all suggest that the RBL have a smaller beaming angle than the XBL. In a unified picture, FR I radio galaxies form the parent population of these beamed objects.

Blazars Apart from the absence of strong emission lines, the properties of BL Lacobjects are very similar to those of flat spectrum radio loud quasars which are highly variable and polarized. The radiation from objects with these properties is largely of non-thermal origin and appears to be relativistically beamed, making the objects distinct in their properties from radio quiet quasars and related objects. It was suggested by E. Spiegel at the Pittsburgh Conference on BL Lac objects in 1978 that objects with such properties be grouped together into the single class of blazars. A object is defined as a blazar (see e. g. Bregman

5. Domesticated biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	*Ex situ* and *in situ* conservation- page 16 NBAGR, NBPGR, NBFGR- pages 18, 20, 24,25 Indian National Gene Bank-pages 21 Germplasm facilities- pages 23, 29 Threatened breeds of animals' list- page 30.
2.	Environment Action Programme (EAP) - 1993	EAP's 'Biodiversity/Wildlife Conservation.
3.	National Policy and Macrolevel Action Strategy on Biodiversity•	Part IV 4.2 Survey of Biodiversity and National Database; (4.7) People's Participation; (4.11) International Cooperation. Chapter 1 (Pg 4-9) Food security status of tribals.
4.	National conservation strategy and policy statement on environment and development, 1992.	3.5 Land and Soil: assistance to states to control shifting cultivation, assistance for reclamation and development of ravine areas, Drought prone areas programme, Desert development programme. 5.2.3 Biodiversity: Protection of domesticated species/varieties of plants and animals in order to conserve indigenous genetic diversity 6.0 Development Policies from Environmental Perspective (6.1.1 Agriculture)
5.	National Forestry Action Plan, 1999♣	None?

6.Wild Animal Diversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Species –specific programmes- page 10 Zoos- page 17
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves', 'Forestry', and 'Biodiversity/Wildlife Conservation' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development, 1992.	3.4 Conservation of Forest and wildlife: adoption of a new Forest Policy (1988),

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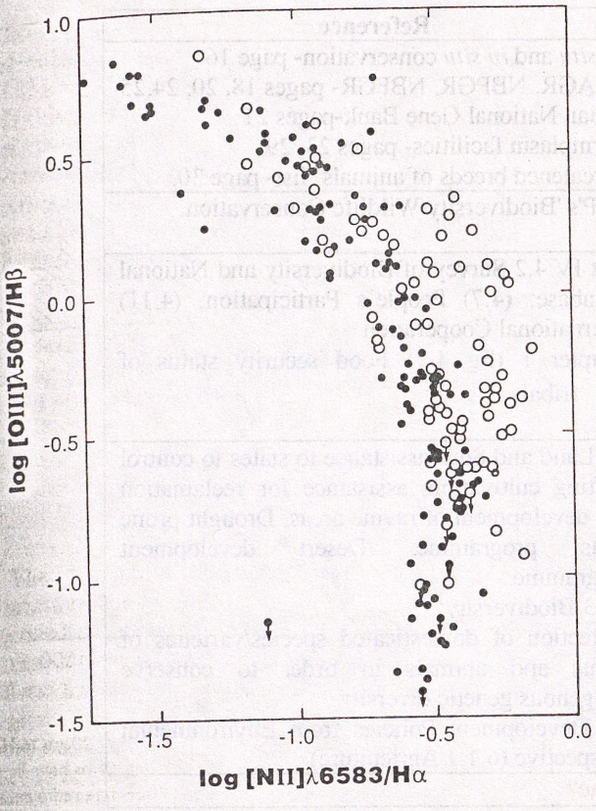

FIG. 7. Behavior of the diagnostic line ratios [N II] λ 6583/Hα vs [O III] λ 5007/Hβ for the disk H II regions (small points) and H II region nuclei (large symbols).

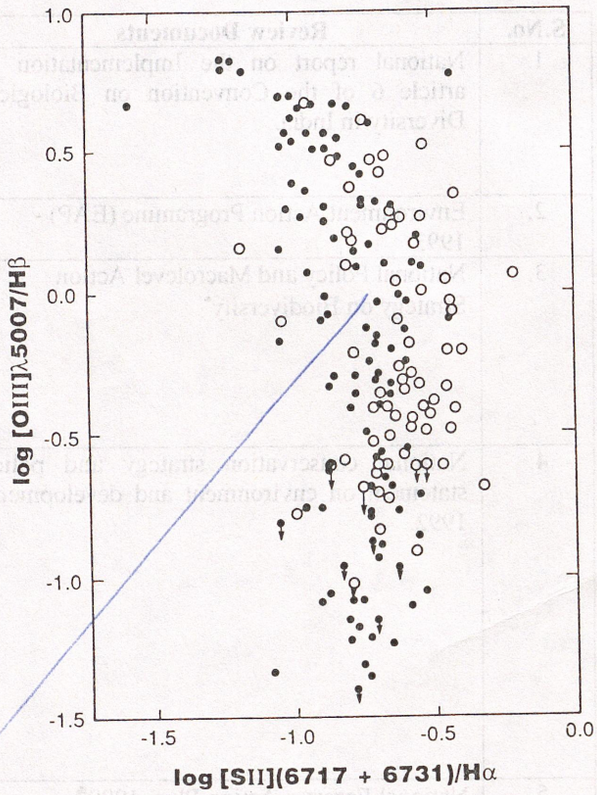

FIG. 8. Behavior of the diagnostic line ratios [S II] (6717 + 6731)/Hα vs [O III] λ 5007/Hβ for the disk H II regions and H II region nuclei. Same symbols as for Fig. 7.

Figure 8 shows the behavior of [S II] λ 6716 + 6731/Hα vs [O III] λ 5007/Hβ in the same sample. Although fewer [S II] data are available, and the observational scatter is larger, a similar trend is present; the nuclei that are anomalously strong in [N II] generally exhibit stronger [S II] emission as well. Similar conclusions hold when other diagnostic ratios such as [O II] λ 3727/[O III] λ 5007 and [O I] λ 6300/Hα are examined, but the numbers of nuclei with reliable data are too small to constitute a meaningful test. Measurements of [O I] λ 6300 would provide an especially strong test of nonstellar ionization, since the line is so weak in normal H II regions. Strong [O I] emission is observed in several nuclei in our sample (also see Heckman *et al.* 1983; Keel 1984).

Since the Balmer-line EWs of the nuclei tend to be much lower than in disk H II regions (Fig. 6), it is important to verify that underlying stellar Balmer absorption lines have not biased the distributions in Figs. 7–8. As discussed in Sec. II, the nuclear Balmer-line fluxes were corrected for stellar absorption, using a simple nuclear stellar population model (Keel 1983a), and these corrected Balmer fluxes are used in Figs. 7–8. Errors in these corrections may introduce spuriously high [O III]/Hβ or [N II]/Hα ratios in a few of the nuclei, but in most of the nuclei the effects of the Balmer absorption are minimal.

Our results confirm that a considerable fraction of the nuclear H II regions, perhaps as many as half, do not fit on the spectral sequence for normal disk H II regions, and it is important to establish the underlying physical cause for the differences. We have considered three possible explanations, abnormally high abundances, radiative transfer effects in the H II regions (including dust), and the presence of shocked gas or a central nonthermal ionizing source.

Unusually high heavy-element abundances could produce the strong forbidden-line emission in the nuclei, but we doubt that this is the primary explanation. The disk H II regions themselves define an abundance sequence, and in the most metal-rich regions the forbidden lines are weak (see Figs. 7 and 8), due to increased cooling with heavy-element abundances (e.g., Searle 1971; Smith 1975; McCall *et al.* 1985). The nuclear H II regions lie well away from the high-abundance tail of the disk H II region excitation sequence. To the contrary, in many galaxies the H II region nuclei possess much higher excitation (e.g., [O III]/Hβ) than the inner disk H II regions (e.g., M83, Dufour *et al.* 1980, also see Fig. 12). Some parameter other than (or in addition to) abundance must be responsible for the anomalous spectra of the nuclei.

If the anomalous nuclei in Figs. 7 and 8 are H II regions photoionized by stars, then the physical conditions in the H II regions must be substantially different from those in the disk H II regions. Comparison of our data with the nebular models of Evans and Dopita (1985) suggests that the only way to produce the observed forbidden-line strengths with stellar ionization would be a combination of unusually hot stars with very low ionization parameters. This is essentially the "Warmer" model for LINER and Seyfert nuclei of Terlevich and Melnick (1985). In the case of the anomalous H II region nuclei, stellar temperature above 45 000 K and ionization parameters approximately two orders of magnitude lower than in the disk H II regions are required.

Several arguments lead us to suspect that this mechanism

		formulation of the National Wildlife Action Plan, establishment of NPs, sanctuaries, bioreserves. 4.3 and 4.4. Agenda for action and Instruments for action.♦ 5.2.3 Biodiversity: Maintenance of corridors between national parks, sanctuaries, forests and other protected areas; Emulation and support for protecting traditional skills and knowledge for conservation; Develop methodologies to multiply, breed and conserve the threatened and endangered species through modern techniques of tissue culture and biotechnology; Restriction on introduction of exotic species of animals without adequate investigation 6.0 Development Policies from Environmental Perspective (6.3 Forestry)
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II- section 2.3; Vol. I section 1.6.2 and section 2.7. (partial coverage)

7. Wild Plant Diversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Medicinal Plant conservation areas- page 15
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves', 'Forestry', and 'Biodiversity / Wildlife Conservation',
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation Chapter II, v.v., (in situ and ex Situ conservation of medicinal Plants Chapter XI, point 9 (need to check over-harvesting of wild plants, need for identification of threatened species, NTFP policies that would make cultivation remunerative) Chapter IV, 4.2.1, (base- line data of species and the genetic diversity
4.	National conservation strategy and policy statement on environment and development, 1992.	3.4 Conservation of Forest and wildlife: adoption of a new Forest Policy (1988), formulation of the National Wildlife Action Plan, preparation of NFAP, establishment of

♦ There is a listing on pages 11-12 of the policy statement.

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

cannot account for most of the nuclei. The typical ionization parameter in the nuclear H II regions can be crudely estimated using the Hα luminosities, densities, and filling factors derived earlier, and these are not consistent with the extremely low parameters required by the model. The absence of very strong [O I] λ 6300 emission in most of the nuclei also argues against very low ionization parameters. The warmer scenario requires the presence of unusually hot ionizing stars, which is inconsistent with the low Balmer-line equivalent widths of the nuclei, and the properties of metal-rich disk H II regions (e.g., Shields and Tinsley 1976; Shields and Searle 1978; Vilchez and Pagel 1988). Finally, the model requires that the anomalous nuclei be observed during a relatively short-lived stage of a star-formation burst, and this is probably inconsistent with the high fraction of [N II] strong nuclei. In summary, the combination of unusually hot ionizing stars with a dilute radiation field may contribute to part of the unusual forbidden-line ratios observed in the H II region nuclei, but the parameters of this model must be severely strained if it is to account for all of the effect.

In our view, the most likely explanation for the anomalously strong forbidden-line emission in the H II region nuclei is the presence of a substantial nonstellar component to the ionization, either from shock-heated gas, as suggested by Stauffer (1981), or from a nonthermal LINER or Seyfert nucleus embedded within the nuclear star-forming region. Before discussing this scenario in more detail (Sec. IV), we first discuss the radio properties of the nuclear and disk H II regions.

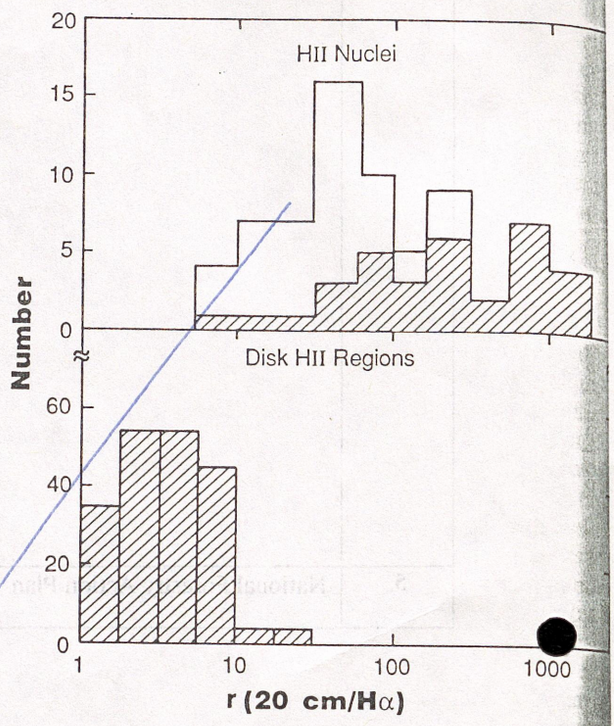

FIG. 9. Distributions of the ratio of radio-continuum flux at 20 cm to Hα flux for the H II region nuclei and disk H II regions. The ratios have been normalized to the value expected for a thermal gas (free–free radio emission) at $T = 10\,000$ K. Arrows indicate 3σ upper limits.

e) Radio-Continuum Emission

Radio-continuum fluxes and Hα fluxes are available in common for 32 H II region nuclei (upper limits for 39 others) and 194 disk H II regions. Since the ratio of thermal free–free radio emission to Balmer-line emission in an H II region is fixed (depending only on temperature), the radio/optical ratio can be used as an indicator of nonthermal emission and/or extinction in the H II regions.

Figure 9 shows the distribution of the ratio of radio to Hα flux for the nuclei and for the disk H II regions. For the H II region nuclei, the detected objects and upper limits are indicated separately. The ratios have been normalized to the theoretical value expected for free–free emission from a 10 000 K extinction-free gas (Oster 1961). In the disk H II regions, the ratio ranges from 1 to 10, with a median ratio of 3.5. As discussed by Israel and Kennicutt (1980) and van der Hulst *et al.* (1987), most of this excess radio emission is probably due to extinction at optical wavelengths, although there is evidence for a small contribution from nonthermal emission, probably from supernova remnants, in some H II regions (e.g., Mills, Turtle, and Watkinson 1978; Skillman 1985; Chu and Kennicutt 1986).

Since the observed reddenings of the nuclear and disk H II regions are similar (Fig. 3), we would expect extinction in the H II region nuclei to have a similar effect on the radio–Hα ratios, but as illustrated (see Fig. 12), the observed ratios are much higher in the nuclei. In the 32 detected nuclei, the average 20 cm flux is 200 times the free–free value (270× if a more realistic temperature of 5000 K is adopted). This result is biased to radio-strong nuclei, since only 45% of the nuclei surveyed were detected. If we assume that the actual fluxes of the undetected nuclei are within a factor of 2 of the limits, the median ratio excess for the entire sample would be ≈60, while if the true fluxes were 10 times lower than the upper limits on average, the median excess would still be ≈20. We suspect that the true average is closer to 60 because many of the "undetected" nuclei in Fig. 9 actually have measured fluxes not far below the formal 3σ detection cutoff. In any case, the nuclei appear to be at least an order of magnitude stronger radio emitters on average, as compared to disk H II regions, and many objects are over 100 times stronger than any disk H II region.

Part of the difference between the nuclei and the disk H II regions may be caused by higher optical extinction in the nuclei, but the similar Balmer decrements in the two samples are inconsistent with the large difference in Fig. 9. Furthermore, if the radio emission of the nuclei were purely thermal this would imply extinction corrections of up to factors of several hundred to the observed Hα emission, and the resulting huge star-formation rates are unrealistic. Consequently it seems likely that the excess radio emission in the H II region nuclei is mainly due to a strong nonthermal component which dominates over the thermal nebular emission at centimeter wavelengths. Further support for this conclusion comes from the presence of subarcsecond compact radio cores in the nuclei of some "H II region" nuclei (Gehrz, Sramek, and Weedman 1983; Keel 1984).

It has been demonstrated previously by Heckman *et al.* (1983) and Keel (1984) that samples of radio-loud Seyfert, LINER, and H II region nuclei possess considerably stronger radio emission (relative to Balmer-line emission) than extranuclear disk H II regions, but since the nuclei were drawn from lists of radio-bright objects it is not clear whether this result is indicative of a physical difference between nuclear and disk H II regions, or is simply an observational selection effect. Figure 9 demonstrates that even an optically selected sample of H II region nuclei exhibits strong

		NPs, sanctuaries, bioreserves. 4.3 and 4.4. Agenda for action and Instruments for action.♦ 5.2.3 Biodiversity: Maintenance of corridors between national parks, sanctuaries, forests and other protected areas; Emulation and support for protecting traditional skills and knowledge for conservation; Develop methodologies to multiply, breed and conserve the threatened and endangered species through modern techniques of tissue culture and biotecnology. Restriction on introduction of exotic species of animals without adequate investigation 6.0 Development Policies from Environmental Perspective (6.3 Forestry)
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II-section 2.3, 2.5, 2.6; Vol. I section 1.6.1, 2.7.2 (partial coverage)
7.	Implementation of article 6 of the Convention on Biological Diversity in India - National Report	Executive Summary /points 15, 16, 20 and 21/ Sec. 2.14, 2.63 (medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).

8. Natural Terrestrial Ecosystems

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	PA network- page 9 Biosphere reserves- page 13 Inventorying and programmes- pages33, 34, 36
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves' 'Forestry'
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development, 1992.	3.5 Land and Soil: assistance to states to control shifting cultivation, assistance for reclamation and development of ravine areas, Drought prone areas programme, Desert development programme. 4.3 and 4.4. Agenda for action and Instruments for action.♦ 5.2.3 Biodiversity: Maintenance of corridors between national parks, sanctuaries, forests and

♦ There is a listing on pages 11-12 of the policy statement.

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

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radio emission, and hence the distinction between nuclear and extranuclear H II regions found by Heckman *et al.* (1983) and Keel (1984) appears to be real.

If this interpretation of the excess radio emission is correct, then most galactic nuclei, including those classified spectroscopically as H II regions, should possess strongly nonthermal radio spectral indices. Those H II region nuclei that have been observed at more than one frequency indeed exhibit steep radio spectra (Condon *et al.* 1982; Heckman *et al.* 1983; Hummel, van der Hulst, and Dickey 1984; Keel 1984; Sramek and Weedman 1986), but again these samples are heavily biased toward radio-luminous objects. Multifrequency radio observations of a complete sample of nuclei would provide valuable information on the relative amounts of thermal and nonthermal emission in the nuclear H II regions.

IV. EVIDENCE FOR NONSTELLAR IONIZATION AND COMPOSITE NUCLEI

The abnormalities in forbidden-line strengths and radio-continuum emission in many of the H II region nuclei can be accounted for naturally if a significant fraction of their ionization is nonstellar, either from shocks or from an unresolved LINER or Seyfert nucleus within the star-forming regions. We consider each of these possibilities in this section, and then present direct evidence for composite structure in at least a few of the nearby "H II region" nuclei.

a) Integrated Emission Properties

Figure 10 shows once again the behavior of [N II] λ 6583/Hα vs [O III] λ 5007/Hβ for disk H II regions, as indicated by the dashed line, and the H II region nuclei, indicated by light points. Shown this time for comparison are similar data (crosses) for supernova remnants (SNRs) in M33 (Blair and Kirshner 1985), and the regions occupied by Seyfert and LINER nuclei (Veilleux and Osterbrock 1987).

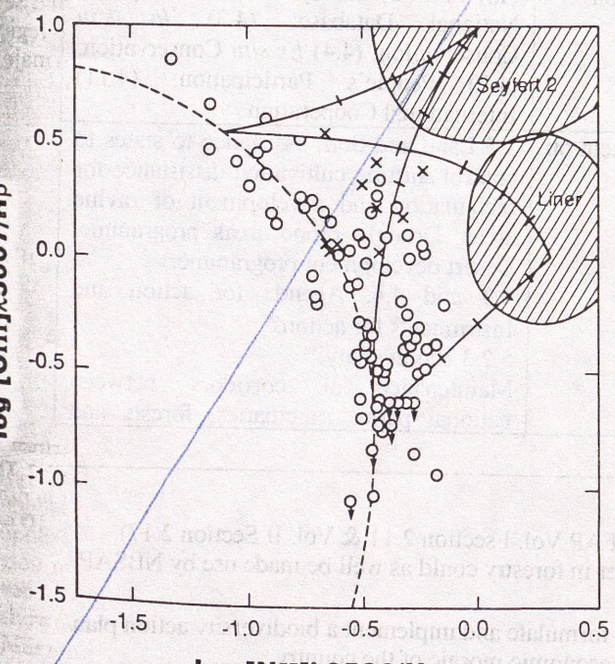

FIG. 10. Behavior of the diagnostic line ratios [N II] λ 6583/Hα vs [O III] λ 5007/Hβ for the H II region nuclei (light circles), disk H II regions (dashed line), supernova remnants (crosses), and LINER and Seyfert nuclei (shaded regions). The dashed lines indicate the line ratios expected for mixtures of emission from a LINER or Seyfert nucleus with a typical high- and low-abundance H II region. See text for details of the mixing models.

It is clear from Fig. 10 that the spectra of the H II region nuclei could be reproduced by mixing normal low-excitation H II regions with SNRs or nonstellar nuclei. For example, Fig. 10 shows mixing lines for a typical high-abundance H II region ([O III]/Hβ = 0.2, [N II]/Hα = 0.35) combined with a typical Seyfert 2 spectrum ([O III]/Hβ = 10, [N II]/Hα = 1) and a typical LINER spectrum *I*[O III]/Hβ = 1, [N II]/Hα = 2). Similar mixing lines are shown with the same nonthermal sources mixed with a low-abundance H II region ([O III]/Hβ = 3.5, [N II]/Hα = 0.08). The tick marks indicate the fractional contribution of the nonstellar component to the total Balmer-line flux, in increments of 20%. These examples illustrate that even the strongest observed [N II] enhancements can be produced with rather modest (10%–30%) contributions from a LINER or Seyfert nucleus, and the range of spectra can be easily covered if a range of H II region abundances is assumed. Stronger Seyfert or LINER contributions would move an object into one of those classifications, and hence outside of our H II region nucleus sample. Similar conclusions would apply for contamination by SNRs or other forms of shock-heated gas. In all cases, the dominant component is still from normal H II regions, as expected given their classification.

Although the spectroscopic data provide evidence for nonthermal contamination in many of the nuclei, they do not provide an unambiguous indication of the nature of the nonthermal component. The [N II] and [S II] emission could be produced by SNRs, as suggested by Stauffer (1981), but a very large number of remnants is required. A typical SNR in M33 or the LMC has an integrated Hα luminosity of order 10^{36}–10^{37} ergs s^{-1} (Blair and Kirshner 1985; Chu and Kennicutt 1988), and hence several hundred to thousand SNRs would be required to produce the observed forbidden-line anomalies and nonthermal radio emission in the brightest nuclei. Furthermore, these high supernova rates would have to be a unique property of the nuclear H II regions, because the disk H II regions exhibit thermal radio emission and emission spectra.

Chevalier and Clegg (1985) and McCarthy, Heckman, and van Breugel (1987) have suggested that much of the line emission in some starbursting galaxies may be produced by low-velocity wind-driven shocks. Such a model provides a good fit to observed forbidden-line intensities and electron density distribution of the filamentary gas in M82, a galaxy with spectral characteristics similar to some of the H II region nuclei. Although SNRs are not directly responsible for the observed emission in this model, supernovae power the slow wind, and uncomfortably high supernova rates or shock efficiencies are required here as well.

Composite nuclei, composed of a central LINER or Seyfert nucleus surrounded by stellar-photoionized H II regions, provide a straightforward explanation for both the intermediate forbidden-line properties of the H II region nuclei and their enhanced radio evidence for such composite nuclei in some nearby galaxies.

b) Direct Evidence for Composite Nuclei

Spatially resolved spectra of selected nuclei in our sample show direct evidence for more than one type of ionizing

		other protected areas.
5.	National Forestry Action Plan (NFAP), 1999♣	NFAP Vol. I section 2.2

9. Natural Aquatic Ecosystems

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Inventorying and programmes-pages32, 35
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves', 'Water Quality'
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development 1992.	3.4 Conservation of Forest and wildlife: management plan for identified wetlands, mangrove areas and coral reefs, formulation of river action plan. 4.3 and 4.4. Agenda for action and Instruments for action.♦
5.	National Forestry Action Plan, 1999♣	None?

10. Micro-organic Diversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Microbial tissue collection, blue-green algae collection- page 23 Inventorying- page. 36
2.	Environment Action Programme (EAP) – 1993.	None
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development 1992.	4.3 and 4.4. Agenda for action and Instruments for action.♦: (Conservation micro -fauna and micro-flora, which help in reclamation of wastelands and revival of biological potential and the land)

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

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♦ There is a listing on pages 11-12 of the policy statement.

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source. As examples, Figs. 11 and 12 show high-dispersion spectra of two H II region nuclei that show evidence for composite structure in the velocity profiles and as a function of position along the slit. Spectra covering the Hβ to 5007 Å region were obtained by W.C.K. using the IPCS and intermediate-dispersion spectrograph on the Issac Newton Telescope on La Palma, as part of a more extensive survey. The instrumental resolution, set in part by sampling, is 0.95 Å FWHM.

Figure 11 shows the spectrum of a $1.0'' \times 2.1''$ area centered on the nucleus of NGC 2782, a bright H II region nucleus with anomalous [N II] and [S II] strengths. Note the dramatically different profiles for the Hβ and [O III] lines, with [O III] showing both a broader core and more extended high-velocity wings. Such structure is not unusual among the nuclei observed to date. Heckman *et al.* (1983) have noted different core widths for these lines in several of the nuclei in our sample.

Two conclusions may be drawn from these results. First, most of the Balmer- and [O III] line emission must arise from different regions, possibly under quite different physical conditions. Second, the high-velocity gas in the wings of the [O III] line must have very high excitation (i.e., characterized by a very high 5007/Hβ ratio), which is reminiscent of the narrow-line emission of the nuclei in many Seyfert galaxies and radio galaxies.

In some of the H II region nuclei the composite structure can be directly resolved. As an example, Fig. 12 shows spectra taken directly on the nucleus of NGC 4303 (top), and at a position 2″ off the nucleus (bottom). Note the sharp drop in excitation as one goes from the central nucleus to the surrounding H II region, as well as the change in linewidths, especially Hβ. The angular separation of these positions corresponds to a linear distance of approximately 150 pc at the distance of NGC 4303. Although the nucleus is not resolved in most ground-based observations, both the long-slit spectra and direct images obtained in excellent seeing conditions resolve the nucleus into a central (probably LINER) component and adjacent H II regions.

The multi-aperture spectra listed in Table I provide additional evidence for excitation gradients such as those seen in the nucleus of NGC 4303. Spectrophotometry in the 6000–6800 Å region taken with aperture diameters of 4.7″ and 8″ are available for 19 of the H II region nuclei in our sample, and many of these galaxies show significant changes in the [N II]/Hα ratio. For the nine nuclei that exhibit anomalously strong [N II] emission ([N II]/H$\alpha > 0.45$), the [N II]/Hα ratio decreases with aperture (or remains constant) in all but one object, consistent with what we would expect if the excess [N II] emission arises from a central source. For the other ten nuclei with normal H II region spectra, the ratio is constant or increases in all but one object. The significance of this result is limited, given the likely observational errors, but it lends qualitative support for the presence of more than one component in many of the H II region nuclei.

A model for a spiral nucleus composed of a nonthermal central source surrounded by stellar-photoionized H II regions has been suggested by several investigators to explain the observed properties of other types of nuclei. For example, evidence for star formation near Seyfert nuclei has been reported in NGC 7496 and NGC 7582 (Veron *et al.* 1981), NGC 5953 (Jenkins 1984), and NGC 5728 (Schommer *et al.* 1988). In view of the increasing evidence for composite ionization in other types of nuclei, perhaps it would not be surprising that many nuclei previously classified as H II regions also exhibit such structure. What may be surprising about our results is how common this structure is even among nearby galaxies with relatively low levels of nuclear emission.

One possible weakness of this interpretation is the similarity of radio properties between H II region, LINER, and Seyfert nuclei. If most of the radio emission in the H II region nuclei is produced by a LINER or Seyfert core, with a major-

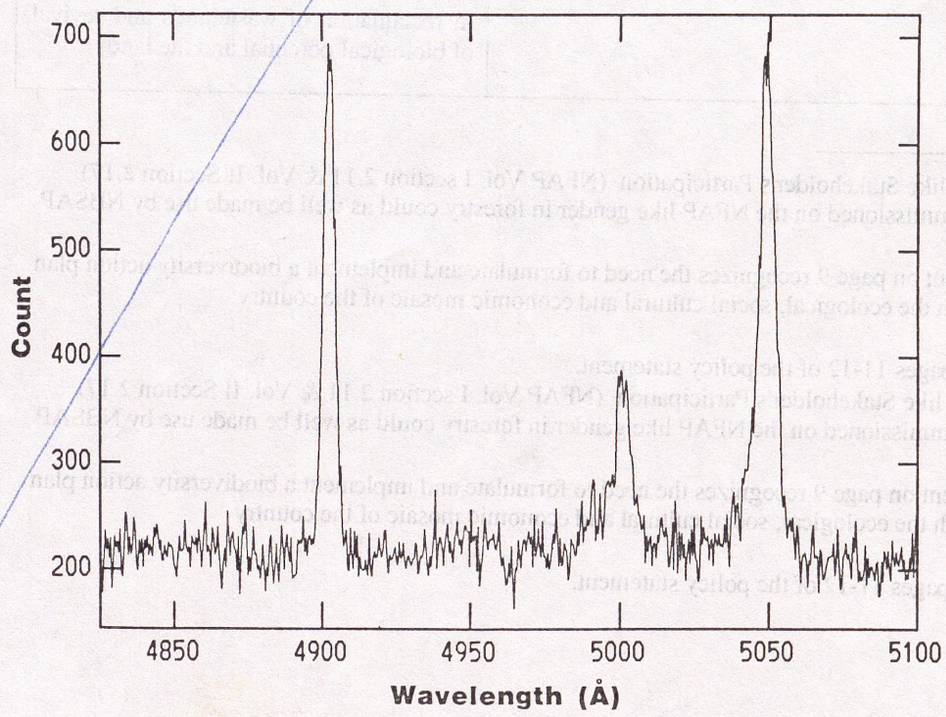

FIG. 11. High-dispersion spectrum of the H II region nucleus NGC 2782. The three emission lines, from left to right, are Hβ, [O III] λ 4959, and [O III] λ 5007.

		5.2.3 Biodiversity: Conservation micro -fauna and micro-flora, which help in reclamation of wastelands and revival of biological potential and the land.
5.	National Forestry Action Plan, 1999♣	None?

11. Policies, Laws and Institutions

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Acts relevant to biodiversity- page 4 Major Programmes of the MoEF –page 6 Legal instruments relevant to biodiversity- page 47
2.	Environment Action Programme (EAP) – 1993.	None
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV, 4.1 Legal and Policy Framework; (4.7) People's Participation; (4.8) Institutional framework and Capacity Building; (4.11) International Cooperation. Chapter 2. Bio-diversity policy and goals mainly referring to action strategy on bio-diversity consisting of 27 points.
4.	National conservation strategy and policy statement on environment and development 1992.	3.1 List of the acts relevant to pollution and wildlife. 3.4 Conservation of Forest and wildlife: stringent provisions under FCAct'80, formulation of the National Wildlife Action Plan preparation of NFAP, establishment of NPs, sanctuaries, bioreserves. 3.6 Environment Impact Assessment 4.3 and 4.4. Agenda for action and Instruments for action.♦: 5.2.3 Biodiversity: Protection and sustainable use of plant and animal genetic resources through appropriate laws and practices; Emulation and support for protecting traditional skills and knowledge for conservation; Restriction on introduction of exotic species of animals without adequate investigation 6.0 Development Policies from Environmental Perspective (6.1.1 Agriculture)
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II-2.8 policy and legislation; 2.21 Restructuring of the Institutions

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♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

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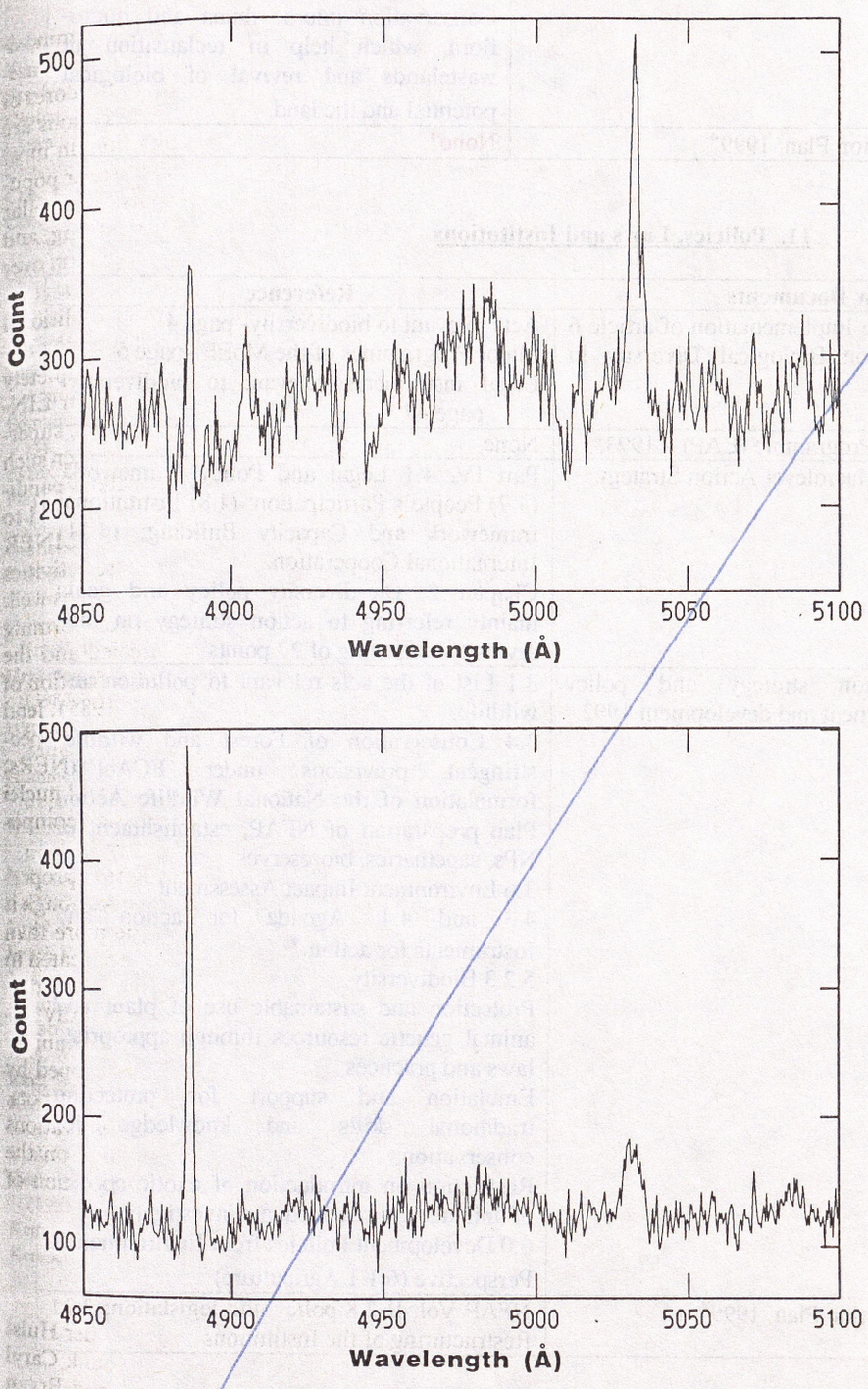

FIG. 12. High-dispersion spectra of the nuclear regions of NGC 4303, taken at positions centered on the H II region nucleus (top), and offset 2″ off the nucleus. The two prominent emission lines are Hβ and [O III] λ 5007. Note the differences in both the line ratios and the line profiles at the two positions.

ity of the Balmer emission coming from the surrounding H II regions, we would expect the ratio of radio continuum to optical line fluxes to be systematically lower in the H II region nuclei than in the nonstellar nuclei. Actual comparisons of the radio/optical fluxes in nearby spiral nuclei do not show any such difference (e.g., Giuricin, Mardirossian, and Mezzetti 1987; Hummel *et al.* 1987), although the large dispersion in radio/optical properties of the nuclei and the low detection rates in the radio may mask any small differences between the different classes of nuclei.

The physical nature of the second emision-line and radio-continuum component in the anomalous "H II region" nuclei remains unclear. Low-level activity powered by a central massive object or a mechanism directly resulting from nuclear star formation (starburst-driven outflows or Warmers) is possible, although both pictures may have difficulty accounting for the high frequency of occurrence implied by our results. Higher spatial resolution optical spectroscopy, and in many cases near IR line spectroscopy, would be of great value in differentiating between the two models.

It is worthwhile noting that although we find evidence for nonstellar ionization in many of the nuclei, our models confirm that most of the ionization is still due to nuclear star formation. The pervasive presence of active star formation in our samples suggests that some level of massive star formation may be occurring in virtually all nuclei, even those classified as LINERs or Seyferts.

12. Access, Benefit Sharing, and Intellectual Property Rights

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Section on ABS-page. 41
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Forestry', "Natural Resource Accounting and 'Biodiversity/Wildlife Conservation themes
3.	National Policy and Macrolevel Strategy on Biodiversity•	Part IV, (4.6) Indigenous Knowledge Systems, Innovations and Practices, and Benefit Sharing; (4.7) People's Participation; (4.11) International Cooperation Chapter 1 (Pg 4-9) Food security status of tribals. Chapter IV Section 4.5.3 and 4.6, (traditional knowledge and IPR)
4.	National conservation strategy and policy statement on environment and development 1992.	3.4 Conservation of Forest and wildlife: preparation of NFAP, establishment of NPs, sanctuaries, bioreserves. 3.5 Land and Soil: assistance to states to control shifting cultivation, assistance for reclamation and development of ravine areas, Drought prone areas programme, Desert development programme. 3.6 Environment Impact Assessment 4.3 and 4.4. Agenda for action and Instruments for action.♦ 5.2.3 Biodiversity: Full and correct rehabilitation of rural poor/tribals displaced due to the creation of national parks/biosphere reserves/tiger reserve, Maintenance of corridors between national parks, sanctuaries, forests and other protected areas. 6.0 Development Policies from Environmental Perspective (6.3 Forestry)
5	National Forestry Action Plan (NFAP), 1999♣	None?

13. Education, Awareness, Training and Research

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Monitoring and databases- page 27[2] Academic programmes- page 6 Public education and awareness- page
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Institutional Structures for Environmental Management and Training',

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♦ There is a listing on pages 11-12 of the policy statement.

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs.

[2] This information is arranged according to eco-system types; e.g. marine biodiversity, forest biodiversity

Many of the hotspot galaxies may represent local, spatially resolved examples of what we observe as composite nuclei at larger distances. Many hotspot galaxies that have been studied spectroscopically show a weak Seyfert or LINER spectrum in the nucleus proper, within a ring of H II regions (e.g., Edmunds and Pagel 1982; Phillips *et al.* 1984; Hummel, van der Hulst, and Keel 1987). Similar configurations are also present in NGC 4736 (Keel 1983c) and NGC 1598 (Phillips *et al.* 1984), and in the Seyfert galaxies NGC 7469 (Cutri *et al.* 1984) and NGC 1068 (Balick and Heckman 1985).

It is straightforward to estimate the distance at which a typical hotspot galaxy would no longer be recognized as such. The ring of H II regions in most nearby hotspot galaxies is less than a kiloparsec in diameter, and hence in arcsecond seeing the ring would appear stellar at distances greater than 100–200 Mpc, and would blend with the nucleus itself at distances of ~30–50 Mpc. It is likely that many of the starburst nuclei in even relatively nearby surveys are actually unresolved hotspot or similar composite objects.

V. CONCLUSIONS

We have compared the properties of those galactic nuclei thought to be dominated by star formation to disk H II regions, in order to test whether the nuclear regions form a physically distinct class of objects, or are simply ordinary stellar-photoionized H II regions that happen to be located in the centers of galaxies. We find that while the bulk properties of these H II region nuclei, and those of circumnuclear hotspots, lie within the range of properties of giant H II regions in the disk, there is evidence for additional physical processes in the nuclear regions.

(1) The emission-line ratios for H II region nuclei generally follow the spectral abundance sequence defined by disk H II regions, but with a much larger dispersion, especially when such low-ionization species as [N II], [S II], and [O I] are considered. The anomalous line ratios are often accompanied by differences in line profiles between different emitting species. The spectra can be reproduced by adding the emission of normal H II regions with the spectrum of a weak Seyfert or LINER nucleus, although other nonthermal ionization sources, such as SNRs, cannot be ruled out. There is evidence for a secondary spectral component in at least half of the H II region nuclei, with a considerable variation in strength. This suggests that a considerable fraction of the spiral nuclei may possess both nuclear star formation and a central nonthermal nucleus.

(2) H II region nuclei show much stronger radio-continuum emission (relative to optical line emission) than disk H II regions, again suggesting additional emission components in the nuclei. The amount of excess radio emission is too large to be readily explained by extinction or supernova remnants.

(3) The densities and filling factors for the gas in optically resolved H II region nuclei are often significantly different from those in typical disk H II regions, but are similar to the conditions observed in other types of spiral nuclei. Again there is a range of properties between those of normal H II regions and nuclei.

(4) The hotspot H II regions are comparable in luminosity to the brightest disk H II regions, but the emission is usually concentrated in regions comparable in size to the cores of giant H II regions. The stellar continua in these regions are much stronger (relative to the line emission) than in most disk H II regions, suggesting either an unusual stellar population or much longer lifetimes for the hotspots. The stellar continua in the H II region nuclei are also very strong, and are consistent with virtually continuous star formation over the age of the disk.

While our data provide strong evidence for an additional emitting component in many (if not most) H II region nuclei, the physical nature of this component is not completely clear. While weak active nuclear activity (Seyferts or LINERs) can readily account for all of the observations, supernova remnants, large-scale wind-driven shocks, or even such exotic objects as Warmers are alternative, if less likely candidates. These latter mechanisms were originally invoked to explain the observed properties of Seyfert and/or LINER nuclei, and hence whatever is responsible for those activities may also be present in many of the H II region nuclei as well. These results, combined with the detection of star-forming H II regions in many Seyfert and LINER nuclei, and the detection of broad-line emission in a substantial fraction of nearby galactic nuclei (Filippenko and Sargent 1985), lend increasing support to the conclusion that the various spectroscopic classes for nuclei, such as H II regions, LINERs, and Seyferts, represent limiting cases, with most real nuclei containing combinations of more than one emission component.

In many respects, the hotspots are intermediate in properties between the disk H II regions and the nuclei. Although it is generally assumed that the hotspots are little more than normal stellar-photoionized H II regions that are located in an unusual environment, the optical continuum and radio-continuum properties of the hotspots are not easily explained in such a simple picture. Unfortunately, our ability to interpret these observations is severely handicapped by the dearth of high-quality spectrophotometry of hotspots. Further optical, infrared, and radio-continuum observations of these objects may provide valuable information on the physical conditions, stellar populations, and ionization of these unusual H II regions.

We are grateful to Mark Phillips and Thijs van der Hulst for discussions concerning this work. We also thank Caryl Gronwall, Jeff Kouba, Pam Kraus, Ed Menze, and Bryan Miller at Carleton College for their capable and enthusiastic assistance with the reduction of the hotspot data. The Isaac Newton Telescope is operated by the Royal Greenwich Observatory on behalf of the UK Science and Engineering Research Council, at the Spanish Observatorio del Roque de los Muchachos on the Island of La Palma. R.C.K. acknowledges support from NSF grant no. AST-8613257. W.C.K. acknowledges support from EPSCoR grant no. RII-8610669. C.A.B. acknowledges support from a grant from the Research Corporation.

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		and 'Environment Education' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity[•]	Part IV, (4.7) People's Participation; (4.8) Institutional framework and Capacity Building; (4.9) Education, Training and Extension; (4.10) Research and Development Activities; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development 1992	3.7. Other activities: NEAC 4.3 and 4.4. Agenda for action and Instruments for action.[♦] 5.2.3 Biodiversity: Intensification of surveys and inventorisation of biological resources in different parts of the country including island ecosystems.
5.	National Forestry Action Plan, 1999[♣]	NFAP Vol. II - 2.15 Skill development and capacity building; 2.13 Research; 2.14 Awareness, also refer Vol. I -2.14, 2.15, 2.16 for Research Extension and HRD.

14. Technologies, Industry, and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Linkages with commercial sector-page 52 Impact assessment programmes- page 39
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Environment Impact Assessment', 'Clean Technologies', and 'Alternative Energy Action Plan' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity.[•]	Part IV, (4.7) People's Participation
4.	National conservation strategy and policy statement on environment and development 1992.	3.5 Land and Soil: assistance to states to control shifting cultivation, assistance for reclamation and development of ravine areas, Drought prone areas programme, Desert development programme. 3.6 Environment Impact Assessment 4.3 and 4.4.Agenda for action and Instruments for action.[♦] 5.2.3 Biodiversity: Full and correct rehabilitation of rural poor/tribals displaced due to the creation of national parks/biosphere reserves/tiger reserve, Develop methodologies to multiply, breed and conserve the threatened and

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[♦] There is a listing on pages 11-12 of the policy statement.

[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

[•] The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

[♦] There is a listing on pages 11-12 of the policy statement.

H II region nuclei (magnitude-limited sample), hotspots, and disk H II regions. The EWs of the disk H II regions are generally of order a few hundred Ångstroms, as expected for regions ionized by OB associations. The observed Hα EWs of the H II region nuclei, on the other hand, are approximately 20 times lower on average. A small part of the difference is due to the background contamination problem discussed above, but most of it must be real. The Hα EWs of the hotspots, while higher than those of the nuclei, are 7 times lower than the average for disk H II regions (in this case the background subtraction should be accurate).

The stronger continuum in the nuclear H II regions indicates the presence of a significantly different underlying stellar population than in normal disk H II regions. In the nuclei the most likely explanation is the presence of an evolved stellar population. Detailed observations of the stellar continua and absorption spectra of nearby spiral nuclei (e.g., Turnrose 1976; Pritchett 1977; Keel 1983b) indicate that the continuum is usually dominated by evolved stars, as would be expected if nuclear star formation has taken place over timescales comparable to the ages of the galaxies (Turnrose 1976). The low-emission-line EWs confirm that the relative contribution of the young ionizing stellar associations to the optical continuum is very small in most cases.

It is interesting to note that the average Hα EW for the H II region nuclei, 25 Å, is similar to the average integrated EW of Sc-Irr galaxies. This EW is also close to the value expected for a stellar population that forms stars at a constant rate over the age of galactic disks (Kennicutt 1983). To the extent that these evolutionary models can be applied to galactic nuclei, they suggest the star formation in the average H II region nucleus has proceeded at approximately a constant rate over most of the age of the disk. Turnrose (1976) derived similar star-formation histories based on spectral synthesis fitting of the continua. The total mass converted into stars by such steady-state star formation can be substantial; applying the calibration of Kennicutt (1983) to the average nucleus in our sample yields an average star formation rate of 0.03–0.05 $\mathcal{M}_\odot$ yr^{-1}, and an integrated mass of 3–5$\times 10^8$ $\mathcal{M}_\odot$. Some inflow of gas into the nuclear regions from outside is probably necessary to fuel this continuous activity. These results are subject to large uncertainties, of course, arising from possible systematic differences between the IMFs, abundances, and extinction in the nuclei and disks, but they are probably at least qualitatively correct.

The low Hα EWs of the hotspots are not as easily understood. If the hotspots are simply normal H II regions that happen to be located close to the nucleus, then we would expect them to have ages comparable to those of disk II regions, a few Myr at most, and the low Hα EWs would have to be caused by something else. The innermost disk H II regions in some galaxies also show low Balmer EWs (Searle 1971; McCall, Rybski, and Shields 1985), and it has been suggested that these are due to a strong deficiency of high-mass stars in the initial mass function (Shields and Tinsley 1976). Perhaps the hotspots simply represent an extension of this trend to very small radii (and high heavy-element abundances).

Another possibility is that star formation in the hotspots takes place over timescales that are much longer than in normal disk H II regions, with the excess continuum arising from more evolved massive stars. In many of the hotspot galaxies we were impressed by the absence of correspondence between the locations of the Hα and continuum knots; good examples in Fig. 1 are NGC 2903 and NGC 4321. The presence of bright star clusters without significant Hα emission indicates an extended period of star-formation activity, and it is possible that at least some of the continuum in the hotspot H II regions is not associated with the current generation of ionizing stars. Taking this idea to its extreme, it is possible that the hotspots occur in ringlike structures at the inner Lindblad resonance (Arsenault *et al.* 1988; M. Phillips, private communication), and if this were the case, star formation might be nearly continuous over the hotspot region as a whole, as was suggested above for the nuclei.

Two other factors that may contribute to the weak Balmer EWs in some of the nuclear H II regions (both nuclei and hotspots) are extinction and density-bounding effects. Heavy internal extinction within the H II regions could reduce the EWs (Sarazin 1977), but the similarity in Balmer decrements between the disk and nuclear H II regions (Fig. 3) suggests that this is probably not the main source of the low EWs in the sample as a whole. Another possibility is that some of the nuclear H II regions are not ionization bounded. As will be discussed below, the forbidden-line spectra of most of the nuclei are inconsistent with severe density-bounding effects, but it is possible that in some regions, especially the most luminous starburst nuclei, the nuclear gas may be completely ionized. Neither of these mechanisms is likely to be the dominant effect, but they may contribute to the low emission-line EWs in some of the nuclei.

d) Emission-Line Spectra and Ionization Processes

A basic assumption underlying the study (and even the definition) of H II region nuclei is that the emitting gas is photoionized by massive stars. This assumption was critically examined by Stauffer (1981), who compared the spectral properties of 20 H II region nuclei to normal H II regions. He concluded that massive stars were the dominant ionization source in most of the nuclei, but he found evidence for shock-ionized gas in several objects. The availability of a larger set of nuclear spectra, as well as a large, homogeneous comparison sample of disk H II regions has enabled us to follow up Stauffer's analysis, and reassess the importance of nonthermal ionization in the nuclei.

We have chosen to analyze the spectra using the classification parameters introduced by Baldwin, Phillips, and Terlevich (1981), and re-examined by Veilleux and Osterbrock (1987). For a comparison of the nuclei and disk H II regions the most useful diagnostic line ratios are [O III] λ 5007/Hβ, [N II] λ 6583/Hα, [S II] λ 6716 + 6731)/Hα, [O II] λ 3727/[O III] λ 5007, and, when available, [O I] λ 6300/Hα. All except [O II]/[O III] are insensitive to reddening, and most of our discussion will center on those ratios.

Figure 7 shows the correlation between [N II] λ 6583/Hα and [O III] λ 5007/Hβ in the disk H II region sample (plotted as small points) and for the H II region nuclei (plotted as light symbols). The disk H II regions follow a well-defined spectral sequence, with abundance as the primary underlying variable (see, e.g., McCall *et al.* 1985). Roughly half of the H II region nuclei fall within this sequence as well, but the remainder fall above and to the right of the disk abundance sequence, in the direction of anomalously strong [N II]/Hα. Stauffer (1981) noted the strong [N II] emission in many H II region nuclei, and suggested that it arose from either very high nitrogen abundances in the nuclei, or from shock-heated gas, such as embedded supernova remnants.

		endangered species through modern techniques of tissue culture and biotechnology; Restriction on introduction of exotic species of animals without adequate investigation 6.0 Development Policies from Environmental Perspective (6.3 Forestry)
5.	National Forestry Action Plan, 1999[♣]	NFAP Vol. II section 2.13
6.	The role of medicinal plants industry in fostering biodiversity conservation & rural development (IDRC)	Articles on the medicinal plants industry
7.	The medicinal plants sector in India (IDRC)	Cultural and historical context of medicinal plants and traditional systems of medicine. Limited information on local trade in medicinal plants.

[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

1990) if it has the following properties: (1) smooth continuum emission from the infrared to the ultraviolet band, (2) high optical polarization (*gneq3* percent), (3) rapid optical variability on a timescale of $\lesssim 1$ day, (4) a strong and variable radio continuum. When an object of this class has weak emission lines compared to the radio quiet quasars, it is called a a BL Lac; when the emission lines are strong, the object is said to be an *Optically Violent Variable* (OVV) quasar.

9.9.1 The Luminosity Function of BL LacObjects

Stickel et al. (1991) have determined the luminosity function of the BL Lacsin their 1 Jy complete sample using the techniques described in Section 7.6.2. The mean value of V/V_m for the sample is $mvbyvml = 0.6 \pm 0.05$ ($H_0 = 50\,\mathrm{km\,sec^{-1}\,Mpc^{-1}}, q_0 = 0$), which is consistent with the value 0.5 for no evolution within 2σ. However interpreting the mean value obtained as probably indicative of evolution, Stickel et al. consider luminosity evolution of the form

$$L_R(z) = L_R(0) \exp\left(\frac{\tau(z)}{\tau_R}\right), \tag{9.6}$$

where $\tau(z)$ is the look-back time and τ_R is the evolutionary timescale in units of the Hubble time. τ_R is determined by finding that value which makes the distribution of the weighted accessible volume V'/V'_m uniform between 0 and 1. The best fit value obtained in this fashion is $\tau_R = 0.36$, with the associated 1 *sigma* interval 90.24, 0.59). The local luminosity function can be obtained from weighted accessible volumes as in Equation 7.51, and fiting a simple power-law form to it gives

$$\Phi_R(L_R) = 2.0{\times}10^{50}\, L_R^{-2.53\pm0.15}\,\mathrm{Gpc^{-3}}L_R^{-1}, \tag{9.7}$$

where L_R is the 5 GHz luminosity in units of $\mathrm{erg\,s^{-1}\,Hz^{-1}}$ and the 1 *sigma* error on the power-law index is 0.15. The index and normalization are also affected by the size of the luminosity bins used, and the values in Equation 9.7 correspond to a bin size of $\Delta(\log L_R) = 0.3$. It follows from the luminosity function that the local number density of BL Lacobjects with the 5 GHz luminosity in the range $(6{\times}10^{31}, 3.4{\times}10^{34}\,\mathrm{erg\,s^{-1}\,Hz^{-1}})$ is $40\,\mathrm{Gpc}^-3$. If the luminosity function is obtained assuming that there is no evolution, then

$$\Phi_R(L_\mathrm{R})dL_\mathrm{R} = 8.9{\times}10^{38} L_\mathrm{R}^{-2.18\pm0.13}\,\mathrm{Gpc^{-3}}dL_\mathrm{R} \tag{9.8}$$

5.28.2

NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

NATIONAL DOCUMENTS RELEVANT TO THE MAJOR NBSAP THEMES: Cross-referencing to Pertinent Sections

Members of the Technical and Policy Core Group (TPCG) of the NBSAP have reviewed a number of national level documents related to environment and biodiversity, for their relevance to the NBSAP process.

The documents reviewed were:

1. National Report on Implementation of Article 6 of the Convention on Biological Diversity, 1998
2. National Policy and Macrolevel Action Strategy on Biodiversity, 1999
3. Environment Action Programme (EAP) 1993
4. National Conservation Strategy and Policy Statement on Environment and Development 1992
5. National Forestry Action Plan 1999 (NFAP)
6. Biodiversity Conservation Prioritisation Project (BCPP) reports, 1999
7. Reports of the International Development Research Centre on medicinal plants

A background and overview is given in the TPCG note: Assessing Existing National Documents Relevant To NBSAP: A Synthesis of the Findings (which is available in the Inaugural National Workshop compendium of papers, and can be requested separately).

This document provides a first-cut listing of the sections and chapters of each of these documents that are relevant to each of the major themes of the NBSAP. This will hopefully be useful to the Thematic Working Groups (TWGs), but also to various other executing agencies of the NBSAP process.

This is only a preliminary version, more will be added, and given to the TWGs and other agencies, as and when further assessments are done.

[This compilation has been done by Kanchi Kohli, based on the reviews undertaken by various TPCG members]

1. Economics and Valuation of Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Direct mention is made in the report.
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Natural Resources Accounting' theme
3	National Policy and Macrolevel Action Strategy on Biodiversity•	Part IV, (4.7) People's Participation; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development, 1992	
5.	National Forestry Action Plan (NFAP), 1999♣	NFAP Vol. II section1.4

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♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

2. Livelihood, Lifestyles and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India	Traditions and lifestyles pertaining to conservation- p. 1; Direct mention of livelihood issues is made of in the report.
2.	Environment Action Programme (EAP) - 1993	EAP's 'Forestry' and 'Alternative Energy Action Plan' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity.*	Part IV, (4.5) Sustainable Utilisation; (4.6) Indigenous Knowledge Systems, Innovations and Practices, and Benefit Sharing; (4.7) People's Participation; (4.11) International Cooperation. Chapter II, v.v., (in situ and ex situ conservation of medicinal plants Chapter XI, point 9 (need to check over-harvesting of wild plants, need for identification of threatened species, NTFP policies that would make cultivation remunerative.) Chapter IV, 4.5, (sustainable use of bio-diversity of the medicinal plants)
4.	National conservation strategy and policy statement on environment and development, 1992	Covered
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II-section2.4 (partial coverage)
6.	Implementation of article 6 of the Convention on Biological Diversity in India - National Report	Executive Summary /points 15, 16, 20 and 21/ Sec. 2.14, 2.63 (medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).

3. Health and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Listing of texts with reference to medicinal plants- page. 41
2.	Environment Action Programme (EAP) – 1993	None
3	National Policy and Macrolevel Action Strategy on Biodiversity*	Part IV, (4.7) People's Participation; (4.11) International Cooperation. Sec.1.2 (need for bio-diversity conservation in the context of medicine and health needs. Chapter IV, 4.2.1, (base-line data of species and the genetic diversity. Can be applied to medicinal plants too. 4.2.2, (process of preparation of the red data books needs to be speeded up and validated.[1] 4.3.1, (medicinal plants in the in situ conservation programme, in southern India. 4.4.1, (community gene banks especially in the

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		context of medicinal plants) 4.5, (sustainable use of diversity of medicinal plants)
4.	National conservation strategy and policy statement on environment and development, 1992	Covered
5.	National Forestry Action Plan, 1999[♣]	
6.	Implementation of article 6 of the Convention on Biological Diversity in India - National Report	Executive Summary /points 15, 16, 20 and 21/ Sec. 2.14, 2.63 (medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).
8.	The role of medicinal plants industry in fostering biodiversity conservation & rural development (IRDC)	Articles on the medicinal plants industry
9.	The medicinal plants sector in India (IDRC)	Cultural and historical context of medicinal plants and traditional systems of medicine. Limited information on local trade in medicinal plants.
10.	Tribal folk medicinal plant resources of South Asia (IDRC)	Articles and talks on different aspects of tribal and folk knowledge of medicinal plants

4. Culture and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Traditions of conservation- page. 1
2.	Environment Action Programme (EAP) - 1993	None
3.	National Policy and Macrolevel Action Strategy on Biodiversity[•]	Part IV, (4.7) People's Participation; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development, 1992.	None?
5.	National Forestry Action Plan, 1999[♣]	None?

5. Domesticated biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	*Ex situ* and *in situ* conservation- page 16 NBAGR, NBPGR, NBFGR- pages 18, 20, 24,25 Indian National Gene Bank-pages 21 Germplasm facilities- pages 23, 29 Threatened breeds of animals' list- page 30.
2.	Environment Action Programme (EAP) - 1993	EAP's 'Biodiversity/Wildlife Conservation.
3.	National Policy and Macrolevel Action Strategy on Biodiversity[•]	Part IV 4.2 Survey of Biodiversity and National Database; (4.7) People's Participation; (4.11) International Cooperation.

[•] The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

[1] This applies to medicinal plants because the methods currently used by BSI are definitely inadequate

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[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

4.	National conservation strategy and policy statement on environment and development, 1992.	None?
5.	National Forestry Action Plan, 1999[♣]	None?

6.Wild Animal Diversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Species –specific programmes- page 10 Zoos- page 17
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves', 'Forestry', and 'Biodiversity/Wildlife Conservation' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity.[•]	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development, 1992.	Covered
5.	National Forestry Action Plan, 1999[♣]	NFAP Vol. II- section 2.3; Vol. I section 1.6.2 and section 2.7. (partial coverage)

7. Wild Plant Diversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Medicinal Plant conservation areas- page 15
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves', 'Forestry', and 'Biodiversity / Wildlife Conservation',
3.	National Policy and Macrolevel Action Strategy on Biodiversity.[•]	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation Chapter II, v.v., (in situ and ex Situ conservation of medicinal Plants Chapter XI, point 9 (need to check over-harvesting of wild plants, need for identification of threatened species, NTFP policies that would make cultivation remunerative) Chapter IV, 4.2.1, (base- line data of species and

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[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

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[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

		the genetic diversity
4.	National conservation strategy and policy statement on environment and development, 1992.	Covered
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II-section 2.3, 2.5, 2.6; Vol. I section 1.6.1, 2.7.2 (partial coverage)
7.	Implementation of article 6 of the Convention on Biological Diversity in India - National Report	Executive Summary /points 15, 16, 20 and 21/ Sec. 2.14, 2.63 (medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).

8. Natural Terrestrial Ecosystems

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	PA network- page 9 Biosphere reserves- page 13 Inventorying and programmes- pages33, 34, 36
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves' 'Forestry'
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development, 1992.	Covered
5.	National Forestry Action Plan (NFAP), 1999♣	NFAP Vol. I section 2.2

9. Natural Aquatic Ecosystems

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Inventorying and programmes-pages32, 35
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Conservation of wetlands, coral reefs, mangroves', 'Water Quality'
3.	National Policy and Macrolevel Action Strategy on Biodiversity.•	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

4.	National conservation strategy and policy statement on environment and development 1992.	Covered
5.	National Forestry Action Plan, 1999[♣]	None?

10. Micro-organic Diversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Microbial tissue collection, blue-green algae collection- page 23 Inventorying- page. 36
2.	Environment Action Programme (EAP) – 1993.	None
3.	National Policy and Macrolevel Action Strategy on Biodiversity.[•]	Part IV (4.2) Survey of Biodiversity and National Database; (4.3) *In situ* Conservation; (4.4) *Ex situ* Conservation; (4.7) People's Participation; (4.11) International Cooperation
4.	National conservation strategy and policy statement on environment and development 1992.	None?
5.	National Forestry Action Plan, 1999[♣]	None?

11. Policies, Laws and Institutions

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Acts relevant to biodiversity- page 4 Major Programmes of the MoEF –page 6 Legal instruments relevant to biodiversity- page 47
2.	Environment Action Programme (EAP) – 1993.	None
3.	National Policy and Macrolevel Action Strategy on Biodiversity.[•]	Part IV, 4.1 Legal and Policy Framework; (4.7) People's Participation; (4.8) Institutional framework and Capacity Building; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development 1992.	Covered
5.	National Forestry Action Plan, 1999[♣]	NFAP Vol. II-2.8 policy and legislation; 2.21 Restructuring of the Institutions

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[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

[•] The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

[•] The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

[♣] Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs.

12. Access, Benefit Sharing, and Intellectual Property Rights

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Section on ABS-page. 41
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Forestry', "Natural Resource Accounting and 'Biodiversity/Wildlife Conservation themes
3.	National Policy and Macrolevel Strategy on Biodiversity•	Part IV, (4.6) Indigenous Knowledge Systems, Innovations and Practices, and Benefit Sharing; (4.7) People's Participation; (4.11) International Cooperation Chapter IV Section 4.5.3 and 4.6, (traditional knowledge and IPR)
4.	National conservation strategy and policy statement on environment and development 1992.	None?
5	National Forestry Action Plan (NFAP), 1999♣	None?

13. Education, Awareness, Training and Research

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Monitoring and databases- page 27[2] Academic programmes- page 6 Public education and awareness- page
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Institutional Structures for Environmental Management and Training', and 'Environment Education' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity•	Part IV, (4.7) People's Participation; (4.8) Institutional framework and Capacity Building; (4.9) Education, Training and Extension; (4.10) Research and Development Activities; (4.11) International Cooperation.
4.	National conservation strategy and policy statement on environment and development 1992	Covered
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II - 2.15 Skill development and capacity building; 2.13 Research ; 2.14 Awareness , also refer Vol. I -2.14, 2.15, 2.16 for Research Extension and HRD.

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan, which is consistent with the ecological, social cultural and economic mosaic of the country.

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs.

[2] This information is arranged according to eco-system types; e.g. marine biodiversity, forest biodiversity

• The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

14. Technology, Industry, and Biodiversity

S.No.	Review Documents	Reference
1.	National report on the Implementation of article 6 of the Convention on Biological Diversity in India.	Linkages with commercial sector-page 52 Impact assessment programmes- page 39
2.	Environment Action Programme (EAP) – 1993.	EAP's 'Environment Impact Assessment', 'Clean Technologies', and 'Alternative Energy Action Plan' themes.
3.	National Policy and Macrolevel Action Strategy on Biodiversity.*	Part IV, (4.7) People's Participation
4.	National conservation strategy and policy statement on environment and development 1992.	None?
5.	National Forestry Action Plan, 1999♣	NFAP Vol. II section 2.13
6.	The role of medicinal plants industry in fostering biodiversity conservation & rural development (IDRC)	Articles on the medicinal plants industry
7.	The medicinal plants sector in India (IDRC)	Cultural and historical context of medicinal plants and traditional systems of medicine. Limited information on local trade in medicinal plants.

* The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country

♣ Cross cutting themes like Stakeholder's Participation (NFAP Vol. I section 2.11 & Vol. II Section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs

Review of the documents submitted to the BCPP with respect to their relevance to NBSAP

Document 1: "Potentials and prospects of Marine Biodiversity in India"

This gives a brief account of the status of biodiversity in mangroves, coral reefs and open oceans, besides presenting case studies and hot spots.

Assessment of the relationship of this document to NBSAP

1. How much or which of the NBSAP scope does the document cover?

This document recognizes the need to conserve Biodiversity. Beyond that, it is structurally and spiritually different from what NBSAP envisages.

2. Is this coverage adequate in terms of the points that action plan should contain?

a. Statement of the issue or the problems

It is covered globally by mentioning threats to biodiversity and the need to have "germplasm preservation centers" and "marine protected areas"

b. Identification of the ongoing initiatives

None

c. Identification of key actors involved

Not addressed to

d. Identification of major gaps in coverage

None

e. Delineation of strategies needed to plug gaps

None

f. List of measures and actions needed

None identified

g. Identification of key elements needed for implementation

Not indicated

KALPAVRIKSH

कल्पवृक्ष

Environmental Action Group

To All Kalpavriksh members
August 10, 1999

Dear

Sub: Appeal for funds to fight a case for the Onge tribals of the Andaman islands

In the 20th year of the founding of Kalpavriksh, we have taken up a very important and critical case, that is presently before the Calcutta High Court.

This is with reference to the Onge tribals, of the Andaman islands. Living on the remote island of Little Andaman, this remarkable community is slowly, but surely being pushed towards extinction by an insensitive and exploitative development process. Some recent investigations done by Kalpavriksh along with the Bombay Natural History Society (BNHS), and the Society for Andaman and Nicobar Ecology (SANE) has clearly brought this feature to light. You are probably already aware of this through an article that was recently published in Frontline on the matter. Kalpavriksh along with SANE and BNHS has filed a writ petition in the Calcutta High Court, which was heard and admitted by the Port Blair Bench on the 27th of July. This is the first positive step, but this is just the beginning.

As you would understand, fighting a case of this nature in a far away place like Port Blair is difficult and resource intensive. So far all the expenses that have been incurred, like stationary, computer time, photocopying, mailing etc. have been from Kalpavriksh's small kitty and by SANE. We are also fortunate in having a lawyer who is arguing the case for free and who is also spending out of his own pocket when needed. There is now a substantial need for funds including those for the travel of the lawyer between the islands and mainland. The next hearing is coming up sometime in September, and we are finding ourselves hard pressed to raise the needed funds and hence this appeal to you.

This petition has given us a very good oppurtunity to correct or at least to influence some of the processes in the islands that we all know, would lead to certain ruination, both for the fragile environment there and the tribes like the Onge. It would indeed be very unfortunate if we have to make a compromise only for the lack of funds.

We would be grateful, indeed indebted if you would respond to our appeal, with monetary support and contributions. Even the smallest amounts would be welcome and help us tremendously. Please send us your cheques, drafts etc. in the name of Kalpavriksh – Pune at the address below.

We will immediately send you receipts for your contributions and also keep you updated on the progress of the case and the how the money is being spent. Your contributions will also be suitably acknowledged.

If you need more details about the Onges, the concerned issues or the case itself, please let us know. We can also send you a copy of earlier mentioned article on the Onge (A people in peril; FRONTLINE; May 7, 1999) that highlights and outlines the basic issues that form the grounds for this case.

We need your help and look forward to a positive and an urgent response from you.

Thanking you

Pankaj Sekhsaria / Ashish Kothari

Apt. 5, Shree Dutta Krupa, 908 Deccan Gymkhana, Pune 411 004, India.
Telefax: ~~(0212) 354239~~ 020-5654239 • Email: ashish@nda.vsnl.net.in
(Delhi Address: c/o B-25, Defence-Colony, New Delhi 110 024)

h. Specific project proposal

None

i. Time frame for implementation

Not considered

3. Which of the thematic and subthematic areas does the document cover?

Theme 9 is directly addressed

4. What major gaps does the document leave in covering the themes and sub themes?

It misses out all except theme 9.

5. Does the document make recommendation for follow up?

No, except mentioning germplasm conservation and marine protected areas

6. Will this document in any way contradicted with other existing action plans?

No

7. Is there any indication of the process carried out in making this document?

This is entirely from published accounts.

Summary:

Would be of some use to TWG on "Natural aquatic ecosystems"

KALPAVRIKSH

कल्पवृक्ष

Environmental Action Group

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August 10, 1999

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We need your help and look forward to a positive and an urgent response from you.

Thanking you

Sekhsaria

Pankaj Sekhsaria / Ashish Kothari

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(Delhi Address: c/o B-25, Defence Colony, New Delhi 110 024)

Document 2: "Corals and coral reefs"

This gives a brief account of the corals and coral reefs of Andaman and Nicobar islands, along with a species list.

Assessment of the relationship of this document to NBSAP

1. How much or which of the NBSAP scope does the document cover?

Annexure 1 to this document lists impacts of commercial and recreational activities on coral reefs.

2. Is this coverage adequate in terms of the points that action plan should contain?

a. Statement of the issue or the problems

None. It is a status account of corals and reefs of Andamans.

b. Identification of the ongoing initiatives

None

c. Identification of key actors involved

Not addressed to

d. Identification of major gaps in coverage

None

e. Delineation of strategies needed to plug gaps

Recommendations for monitoring of reefs and mandatory EIAs have been made.

f. List of measures and actions needed

As above

g. Identification of key elements needed for implementation

Not indicated

h. Specific project proposal

None

i. Time frame for implementation

Not considered

3. Which of the thematic and subthematic areas does the document cover?

Theme 9 is directly addressed

4. What major gaps does the document leave in covering the themes and sub themes?

It misses out all except theme 9.

5. Does the document make recommendation for follow up?

No, except mentioning strengthening of management mechanisms

6. Will this document in any way contradicted with other existing action plans?

No

7. Is there any indication of the process carried out in making this document?

This is entirely from published accounts.

Summary:

Would be of some use to TWG on "Natural aquatic ecosystems"

Document 3: "Prioritization of biological conservation sites in Indian wetlands"

This is an executive summary of a process that prioritizes the wetlands of India based on a combination of ecological and socio-economic criteria.

Assessment of the relationship of this document to NBSAP

1. How much or which of the NBSAP scope does the document cover?

This document provides useful information on wetlands from all Indian states and their priority levels.

2. Is this coverage adequate in terms of the points that action plan should contain?

a. Statement of the issue or the problems

Useful to the extent of satisfying one of the requirements of TWG on natural aquatic ecosystems – "present status of wetlands"

b. Identification of the ongoing initiatives

None apparent

c. Identification of key actors involved

None apparent

d. Identification of major gaps in coverage

None apparent

e. Delineation of strategies needed to plug gaps

None

f. List of measures and actions needed

None indicated

g. Identification of key elements needed for implementation

Not indicated

h. Specific project proposal

None

CONSERVATION AND LIVELIHOODS NETWORK

WHY THIS NETWORK?

Recognition of the need to reconcile wildlife conservation and people's livelihood needs, and promote people's participation in wildlife conservation, has grown considerably in the last decade or so. Across India, a range of options for community participation and benefit-sharing are being tried out, including formal and informal joint management schemes in protected areas (PAs) which have been historically managed by centralised bureaucracies: eco-development by state agencies; self-initiated forest and wildlife protection committees by villagers; NGO participation in conservation, and others. There is also increasing collaboration in resisting the destructive industrial/developmental forces that threaten natural habitats and local communities.

However, there is as yet no national support structure for this move towards reconciling wildlife and human needs, or the efforts at co-management or community-based management of natural habitats, focused both on protected areas and outside. Individual NGOs and forest/other government officials are attempting to provide such support, but these are sporadic and uncoordinated. An ideal support structure would assist communities, NGOs, forest officers, and others to access information and expertise needed to build up and implement participatory conservation programmes; facilitate exchange of ideas and information; help in conducting participatory action research; and work towards appropriate administrative, legal, policy, and educational changes which would facilitate participatory conservation processes. *This would be a relatively neutral process, aiding various stakeholders, rather than taking a one-sided view of the issue.*

As a step in the direction of creating such a support structure, a **CONSERVATION AND LIVELIHOODS NETWORK** was agreed upon and created at the 3rd Consultation on Wildlife Conservation and People's Livelihood Rights that was held in Bhopal from May 1-3 1999. This Consultation was attended by several social action and conservation groups, forest officials, and independent experts.

THE GUIDING PRINCIPLES

The principles guiding the Network are:

1) The fundamental right to existence of all wild animals and plants, and the need for protected/conservation areas and legal measures to ensure this right;
2) The fundamental right of local communities to the survival and livelihood resources which they have traditionally enjoyed, and to participate equitably in conservation programmes;
3) The need for the full protection of threatened wildlife species across the country, for which certain inviolate zones (demarcated in a participatory manner), and changes in existing resource use activities, may be necessary;
4) The unacceptability of forced displacement of traditional communities from PAs or other habitats.
5) The unacceptability of imposing large-scale destructive modes of 'development' on wildlife habitats and local communities, and the necessity of finding alternative paths of achieving human welfare.

STRUCTURE AND MODE OF WORKING

The network would consist of the following:

1. A **Network Hub**, fully funded through the Network, with two or three full-time people.
2. A **Core Forum** of 20-25 groups and individuals from various sectors, who would provide the concrete support for the Network, be available for quick decisions, and be willing to take joint actions. The Network Hub would be accountable to this core forum, which, if funds permit, would also meet once a year. Critically, the Core Forum would ensure that the network decisions are balanced and open to all stakeholder interests.
3. A wider, loose, **open network** of groups and individuals, from government, NGOs, local communities, and other stakeholders, who would feed into and be assisted by, the activities mentioned below.

At some point in the evolution of the Network, the possibility of establishing **Regional Coordination**

i. Time frame for implementation

Not considered

3. Which of the thematic and subthematic areas does the document cover?

Theme 9 is directly addressed

4. What major gaps does the document leave in covering the themes and sub themes?

It misses out all except theme 9.

5. Does the document make recommendation for follow up?

It makes recommendations for undertaking studies on lesser-known wetlands of biodiversity potential.

6. Will this document in any way contradicted with other existing action plans?

No

7. Is there any indication of the process carried out in making this document?

This does not seem to be participatory but the methodology could prove to be a useful strategy.

Summary:

We should request Prof. Samant to provide a copy of the full report to chairman of the TWG on Natural aquatic ecosystems.

Document 4: "Final report of the sub group on COASTS under BCPP"

This is an account of the conservational plans for selected wetlands. Information on a methodology used to evaluate the ecologic and socio-economic criteria is also given.

Assessment of the relationship of this document to NBSAP

1. How much or which of the NBSAP scope does the document cover?

All the case studies discuss the status and threats to biodiversity. They also cover social and cultural attributes and, by extension, the role of indigenous population in conservation of biodiversity.

2. Is this coverage adequate in terms of the points that action plan should contain?

a. Statement of the issue or the problems

The case studies recognize the threats to biodiversity and the need to conserve it.

b. Identification of the ongoing initiatives

Some case studies, like that on the Gulf of Mannar, speak of the ongoing initiatives like the GEF/UNDP project.

c. Identification of key actors involved

MoEF has been identified

d. Identification of major gaps in coverage

The case studies are more like status reports

e. Delineation of strategies needed to plug gaps

The case study by Shailesh Nayak lists a few such.

f. List of measures and actions needed

Recommendations have been made in all case studies, though they are usually site-specific.

g. Identification of key elements needed for implementation

Not indicated

h. Specific project proposal

None

i. Time frame for implementation

Not considered

3. Which of the thematic and subthematic areas does the document cover?

Theme 9 is directly addressed

4. What major gaps does the document leave in covering the themes and sub themes?

All case studies speak of cultural and social attributes. I am not very confident whether the TWG on culture can derive much benefit from this information.

5. Does the document make recommendation for follow up?

All case studies provide some site-specific recommendations.

6. Will this document in any way contradicted with other existing action plans?

No

7. Is there any indication of the process carried out in making this document?

This is entirely from published accounts.

Summary:

Would be of some use to TWG on "Natural aquatic ecosystems"

1. Workshop on Possibilities of Joint Management of Protected Areas, New Delhi, September 1994
2. Jungle Jeevan Bachao Yatra, Gujarat/Rajasthan/Maharashtra/M.P./U.P., January-February 1995
3. South Asian Regional Workshop on Community-Based Conservation, New Delhi, February 1997
4. First Consultation on Wildlife Conservation and People's Livelihoods, Bhikampura, Rajasthan, April 1997
5. Second Consultation on Wildlife Conservation and People's Livelihoods, Bhikampura, Rajasthan, April 1998

In addition, they have been involved in producing *JPAM Update*, a bi-monthly newsletter on protected areas and people, which goes out to about 350 people from various sectors. It is proposed that this newsletter, perhaps with appropriate changes, could become the vehicle for this Support Network.

PROFILE OF CORE FORUM (POTENTIAL MEMBERS)

Potential members of the Core Forum, many of whom are already involved at an informal level in networking on this issue, include the following (they have not yet been asked, but are already involved in the informal networking mentioned above):

NGOs institutions: Ekta Parishad (M.P.), Tarun Bharat Sangh (Rajasthan), Society for Promotion of Wastelands Development (Delhi), World Wide Fund for Nature (Delhi), Sanctuary Asia (Mumbai), Bombay Natural History Society (Mumbai), Vrikshamitra (Maharashtra), Amravati Nature Conservation Society (Maharashtra), Ranthambhor Foundation (Delhi), Wildlife First (Mysore/Bangalore), Wildlife Institute of India (Dehradun), SACON (Coimbatore), Natures' Beckon (Assam), Indian Institute of Public Administration (Delhi), Vidarbha Natural History Society (Maharashtra), Kalpavriksh (Pune/Delhi), and others.

Government: Representatives of the Union Ministry of Environment and Forests, and of Forest Departments of some states (perhaps on a rotational basis, and including the states where the regional offices are based).

BUDGET

Funds for this Support Network should ideally come from the constituents of the Network, to generate a sense of ownership and make the process sustainable. Some additional support, if needed, can be sought from other governmental and non-governmental sources. Once there is acceptance in principle, a detailed budget will be indicated.

(Ashish Kothari)
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REVIEWS OF DOCUMENTS FROM MEDICINAL PLANT PERSPECTIVE

Darshan Shankar

(1) NATIONAL POLICY AND MACROLEVEL ACTION STRATEGY ON BIO-DIVERSITY

The document under sec.1.2 does justify the need for bio-diversity conservation in the context of medicine and health needs. It also highlights the importance of medicinal plants.

Under Sec.1.3, access to traditional knowledge and technology is talked about. The document has a very low image of the values of traditional knowledge. It talks oF traditional knowledge as a sort of 'raw material', which the developed countries will improve upon and provide back in return improved technology and financial resources..

Imp.

In Chapter II, point v.v, it talks of the need for in situ and ex situ conservation of medicinal plants.

Under point 9, in Chapter XI, it talks about the need to check over-harvesting of wild plants, need for identification of threatened species and hints about NTFP policies that would make cultivation remunerative.

In Chapter IV, under 4.2.1, the report points out to the base-line data of species and the genetic diversity, particularly the intra-diversity, distribution pattern and micro habitats. This can be applied to medicinal plants too.

Under 4.2.2, the report points out that the process of preparation of the red data books needs to be speeded up and should be validated using internationally recognized guidelines. This applies to medicinal plants because the methods currently used by BSI are definitely inadequate. That was exposed in the way in which the 'negative list' for medicinal plants was drawn up by the Ministry of Environment & Forests, Government of India.

Need a note on this for Health & Wild Plants TWG

Under 4.2.3, dealing with 'action points', I think, it is important to review working of ENVIS which is the national database for bio-diversity.

which? as a whole

In the context of medicinal plants, there is also a need to involve para-taxonomists to complement the work of professional taxonomists.

any guidelines?

→ Also trad taxonomical system

½ page note by Darsh

In the context of medicinal plants, the use of PBR for documenting traditional knowledge, innovations is relevant.

For medicinal plants, we also need to promote the use of rapid methods of 'threat assessment' which should be standardized and applied to different taxa.

Specific task on rapid assessments — who to? CAMPs?

Under 4.3.1, on 'In Situ Conservation', the report has taken note of the medicinal plants in the in situ conservation programme being implemented in southern India.

Under 4.4.1, on 'Ex Situ Conservation', whereas the report talks about strengthening the government gene banks, I think, there is a need to create Community Gene Banks and Community Conservation Parks specially in the context of medicinal plants to complement the official efforts.

Any examples documented?

Under 4.4.2, I think, every Taluk in the country needs an "Ethno-Botanic Gardens". The report focuses only on efforts of major national institutes.

Darshan to provide

Under 4.5, sustainable use of bio-diversity of the medicinal plants has been talked about. The need for a coordinated approach has been rightly pointed out.

Darshan to also put note ~~on~~ on NBSAP into Annexure

width of gravitating pockets. The rms $\Delta T/T$ would thus increase linearly with the inverse of the beam width angle. Finally, the model has definitive predictions for the relic neutrino temperature. For a given temperature at the nucleosynthesis epoch, the universe expands some 10^8 to 10^{10} times slower than the *Standard Big Bang* model (SBB). This would mean that weak interactions would still be in equilibrium when electrons and the positrons annhiliate. This would heat up the neutrinos to the same temperature as the photons unlike the corresponding situation in SBB.

We may expect the planned precision experiments to distinguish the features described above over the next decade [hopefully sooner].

The National and State NTFP Policy and Programme is, however, very weak. This has not been adequately pointed out under 4.5.2 GAP.

Under 4.5.3 and 4.6, whereas the subject of traditional knowledge and IPR is covered, there needs to be specific mention of a standard Material Transfer Agreement (MTA) and Information Transfer Agreement (ITA). It There is also need to specially emphasize revitalization of local knowledge systems for self-reliance of local communities rather than only pressing upon the terms of access for local knowledge for its commercial application.

(2) IMPLEMENTATION OF ARTICLE 6 OF THE CONVENTION ON BIOLOGICAL DIVERSITY IN INDIA - NATIONAL REPORT

In the Executive Summary and under points 15, 16, 20 and 21 and in Sec. 2.14, 2.63, the report has taken note of the medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).

(3) NATIONAL FORESTRY ACTION PROGRAMME - INDIA

I have only looked at the 'Executive Summary' of this document.

Under Sec.5 - Role of the Forestry Sector in Economy - it would have been important to mention medicinal plants in a specific way because we are talking about 8000 odd species.

Under Sec.6, "Pressure on Forests", the analysis is incomplete. For example, 'over-harvesting for commercial purposes' is not mentioned at all.

Under Sec.13 "Forest-based Processing Sector", despite the fact that herbal industry is of the size of Rs.4000 crores annual turn-over and derives about 90% of the medicinal plants raw materials from the forests, this sector is not covered or mentioned.

There is a need to put a 'medicinal plants' aspect into every sections of the NFAP, viz., forest inventory, forest policy, NWFP and forest-based processing sector.

The document should mention, under the In Situ Conservation, the fact that a network of over 50 Medicinal Plants Conservation Areas has been established.

To conclude, NFAP has practically no coverage of the role of medicinal plants conservation in the forestry sector.

(4) THE ROLE OF MEDICINAL PLANTS INDUSTRY IN FOSTERING BIODIVERSITY CONSERVATION & RURAL DEVELOPMENT (IDRC)

This document contains a set of articles on the medicinal plants industry. The contents of this report are sketchy. It will not provide an in-depth data on the subject that it deals with; viz., (a) 'Emerging Global Markets in Medicinal Plant Products', (b) 'Problems faced by herbal industry relating to safety, efficacy and quality', (c) 'R & D Issues of the industry', (d) 'Cultivation & Processing Technology', (e) 'Socio-economic and development issues'.

The TWG which deals with the industry and bio-diversity is however recommended to have a look at this book, because it may give current perspectives of the industry, on the subjects mentioned above.

One more salient feature of the General Theory of Relativity is that it helps us to predict about the changing size of the Universe, although different scientists have their own different opinions about the matter. According to Einstein, the size of the "finite" universe was determined by the amount of matter contained in it, but De Sitter disagreed to what Einstein believed. Friedmann and Lemaitre remarked space to be spherical. So, they said that it had no beginning or end, yet contains finite superticial area.

From the physical point of view, the General Theory of Relativity is a marvellous synthesis. It is at present admitted practically by all the scientists and mathematicians. The theory also gives a Unified Theory which states that Relativity has shaped all our concepts of space, time and gravitation and the realities that are too remote and too vast to be perceived. So, the General Theory of Relativity plays a vital role in every part of one's life although its detailed study is a fascination of only physicists and Mathematicians.

—— X END X ——

(5) THE MEDICINAL PLANTS SECTOR IN INDIA (IDRC)

This report reviews the cultural and historical context of medicinal plants and traditional systems of medicine. It gives limited information on local trade in medicinal plants - limited information on cultivation scenario and on ex situ and in situ conservation. It gives a qualitative (not quantitative) picture of marketing channels from the primary collection in rural areas to bigger domestic market place including the international market. It gives limited information and databases in the medicinal plants sector and makes recommendations for sustainable development of the medicinal plants sector.

This is a sketchy report, but can be used by both Health & Bio-diversity TWG and Industry & Bio-diversity TWG for qualitative information.

(6) TRIBAL FOLK MEDICINAL PLANT RESOURCES OF SOUTH ASIA (IDRC)

This report consists of articles and talks by knowledgeable people on different aspects of tribal and folk knowledge of medicinal plants. It is also a very sketchy report and does not give any in-depth data either on the resources or the local community health systems. The report can, however, be useful for gathering perspectives. This report can be looked at by Health and Bio-diversity TWG and the sub thematic group of Local Health Traditions and Bio-diversity.

(7) The two WWF documents I saw are reports of two CAMP workshops for rapid assessment of threat status of medicinal plants. One pertains to North India and the other to South India. They are useful for getting a picture of CAMP methodology for rapid assessment and give the list of some threatened species of North India and South India. The assessments so far have covered only a fraction of the potentially threatened species.

Courier

January 6, 1998

Our Ref : JVN/1998/Recom/5782

CONFIDENTIAL

Dr Alok Saxena,
Coordinator,
Satya Murthy Memorial Award 1997,
Van de Graaff Laboratory,
Nuclear Physics Division,
Bhabha Atomic Research Centre,
Mumbai - 400 085.

Dear Dr Saxena,

This has reference to your circular on the Satya Murthy Memorial Award. I enclose a * nomination in the name of Dr R. Srianand who is a very productive young scientist at IUCAA. The relevant *details are attached with this letter. If you need more details please let me know.

I am sorry for this delay in sending the nomination. Because of an important international conference taking place here it took me longer than your deadline to send you the relevant details. I hope your committee will condone this.

With kind regards,

Yours sincerely,

Professor J. V. Narlikar

Encl : * as above.

TWG General 5.24\Them Doc\Review of documents from medicinal plant perspectives\Ver 1 DS\30.5.2000

(1) NATIONAL POLICY AND MACROLEVEL ACTION STRATEGY ON BIO-DIVERSITY

The document under sec.1.2 does justify the need for bio-diversity conservation in the context of medicine and health needs. It also highlights the importance of medicinal plants.

Under Sec.1.3, access to traditional knowledge and technology is talked about. The document has a very low image of the values of traditional knowledge. It talks oF traditional knowledge as a sort of 'raw material', which the developed countries will improve upon and provide back in return improved technology and financial resources..

In Chapter II, point v.v, it talks of the need for in situ and ex situ conservation of medicinal plants.

Under point 9, in Chapter XI, it talks about the need to check over-harvesting of wild plants, need for identification of threatened species and hints about NTFP policies that would make cultivation remunerative.

In Chapter IV, under 4.2.1, the report points out to the base-line data of species and the genetic diversity, particularly the intra-diversity, distribution pattern and micro habitats. This can be applied to medicinal plants too.

Under 4.2.2, the report points out that the process of preparation of the red data books needs to be speeded up and should be validated using internationally recognized guidelines. This applies to medicinal plants because the methods currently used by BSI are definitely inadequate. That was exposed in the way in which the 'negative list' for medicinal plants was drawn up by the Ministry of Environment & Forests, Government of India.

Under 4.2.3, dealing with 'action points', I think, it is important to review working of ENVIS which is the national database for bio-diversity.

In the context of medicinal plants, there is also a need to involve para-taxonomists to complement the work of professional taxonomists.

In the context of medicinal plants, the use of PBR for documenting traditional knowledge, innovations is relevant.

For medicinal plants, we also need to promote the use of rapid methods of 'threat assessment' which should be standardized and applied to different taxa.

Under 4.3.1, on 'In Situ Conservation', the report has taken note of the medicinal plants in the in situ conservation programme being implemented in southern India.

Under 4.4.1, on 'Ex Situ Conservation', whereas the report talks about strengthening the government gene banks, I think, there is a need to create Community Gene Banks and Community Conservation Parks specially in the context of medicinal plants to complement the official efforts.

Under 4.4.2, I think, every Taluk in the country needs an "Ethno-Botanic Gardens". The report focuses only on efforts of major national institutes.

Under 4.5, sustainable use of bio-diversity of the medicinal plants has been talked about. The need for a coordinated approach has been rightly pointed out.

The National and State NTFP Policy and Programme is, however, very weak. This has not been adequately pointed out under 4.5.2 GAP.

Under 4.5.3 and 4.6, whereas the subject of traditional knowledge and IPR is covered, there needs to be specific mention of a standard Material Transfer Agreement (MTA) and Information Transfer Agreement (ITA). It There is also need to specially emphasize revitalization of local knowledge systems for self-reliance of local communities rather than only pressing upon the terms of access for local knowledge for its commercial application.

(2) IMPLEMENTATION OF ARTICLE 6 OF THE CONVENTION ON BIOLOGICAL DIVERSITY IN INDIA - NATIONAL REPORT

In the Executive Summary and under points 15, 16, 20 and 21 and in Sec. 2.14, 2.63, the report has taken note of the medicinal plants in the context of in situ conservation, conservation assessment and in relation to the documentation of local knowledge (2.51).

(2) NATIONAL FORESTRY ACTION PROGRAMME – INDIA

I have only looked at the 'Executive Summary' of this document.

Under Sec.5 - Role of the Forestry Sector in Economy - it would have been important to mention medicinal plants in a specific way because we are talking about 8000 odd species.

Under Sec.6, "Pressure on Forests", the analysis is incomplete. For example, 'over-harvesting for commercial purposes' is not mentioned at all.

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NBSAP Review Document
Environment Action Programme (EAP) - 1993

A brief description of the EAP:

The objectivs of the EAP were to:

a) assess the environment scene in India against the backdrop of the changing economic policies and programmes;
b) review the current policies and programmes which address the various environmental problems of the country;
c) identify the future direction and thrust of these policies and programmes to establish priorities and outline a strategy for the implementation of these priorities;
d) identify programmes and projects for a sustained flow of investment resources for improved provisioning of environmental services for better quality of life and for integrating environmental concerns into development projects; and
e) identify projects for organizational strengthening for better environmental management.

The EAP also identified seven top priority areas which included

a) conservation and sustainable utilization of biodiversity in selected eco-systems including forests, mangroves, wetlands, coral reefs, mountain ecosystems;
b) afforestation, waste lands development and conservation of soil and moisture and ensuring that water sources were not polluted;
c) control of industrial and related pollution with an accent on the reduction and/or management of wastes, particularly hazardous wastes;
d) improving access to clean technologies;
e) tackling urban environmental issues;
f) strengthening scientific understanding of environmental issues, as well as structures for training at different levels, orientation and creating environmental awareness, resources assessment, water management problems etc.; and
g) an alternative energy plan.

The process through which the EAP was formulated:

1) The Ministry of Environment and Forests was the nodal agency for conducting the EAP exercise. (Financial assistance: UNDP)
2) The MOEF constituted an EAP Implementation Committee which comprised the Ministries and Departments of the Govt. of India which were concerned with relevant sectoral issues.
3) The making of thematic reports was assigned to 'non-governmental institutes of academic excellence'.
4) These institutes were invited to participate in the meetings of the Implementation Committee.
5) A draft interim EAP document was finalized in Nov., 1992.
6) It was after this that a National Workshop was held. It was attended by about 35 NGOs. The draft EAP document was thus prepared and submitted for inter-Ministerial discussions after which the document was finalized.

The EAP is structured as follows:
1.Introduction. 2.Status of the Environment. 3.Natural Resources. 4.India's Legal and Organizational Framework for Environmental Management. 5.Current Programmes. 6.Diagnosis. 7.Priorities. 8.Strategy. 9.Programmes. -Figures and Tables-.

A Comparative Analysis of the EAP and the Proposed NBSAP

A. How much or which of the NBSAP scope and coverage points does the document cover?

Items 1 and 2 (Natural ecosystems and 'Wild' species and varieties) are covered by the EAP.
Item 3 (Agricultural ecosystems) falls within the purview of some of the discussion, but it is not a prioritized concern of the EAP.

1984

1986N87-27573.....B
BARDEEN, J. M.
0.323 0/86
Astrophysical cosmology

1986MNRAS.223..763M
MCDOWELL, J. C.
0.323 12/86
The light from Population III stars

1986isosibook..143S
SILK, J.
0.323 0/86
The cosmic microwave background radiation - Implications for galaxy formation

1986HiA.....7..307P
PARTRIDGE, R. B.
0.323 0/86
The angular distribution of the cosmic background radiation

1986CaJPh..64..152B
BARROW, J. D.
0.323 2/86
General relativistic cosmological models and the cosmic microwave background radiation

1986CaJPh..64..147S
SILK, J.
0.323 2/86
The cosmic microwave background radiation and galaxy formation

1986cafp.symp...89M
MELCHIORRI, F.;MORENO, G.; DALL\'OGLIO, G.; MELCHIORRI, B.
0.323 0/86
The cosmic background radiation

1986A&A...162....5M
MILANESCHI, E.;VALDARNINI, R.
0.323 7/86
Small-scale polarization of the cosmic background radiation

1985MNRAS.213..917B
BARROW, J. D.;SONODA, D. H.; JUSZKIEWICZ, R.
0.323 4/85
Universal rotation - How large can it be?

1985ApJ...290....1T
TOLMAN, B. W.
0.323 3/85
The polarization of the microwave background in open universes

1985A&A...151....7M
MILANESCHI, E.;FABBRI, R.
0.323 10/85
Polarization of the microwave background radiation in Bianchi type-I cosmological models with a homogeneous magnetic field

1993ApJ...413L...1G
GUNDERSEN, J. O.;CLAPP, A. C.; DEVLIN, M.;HOLMES, W.; FISCHER, M. L.; MEINHOLD, P. R.;LANGE, A. E.; LUBIN, P. M.;RICHARDS, P. L.; SMOOT, G. F.
0.288 8/93
A degree scale anisotropy measurement of the cosmic microwave background near the star Gamma Ursae Minoris

1991ApJ...371L...1S
SMOOT, G. F.;AYMON, J.; BENNETT, C. L.;KOGUT, A.; BACKUS, C.
0.288 4/91
Preliminary results from the COBE differential microwave radiometers - Large angular scale isotropy of the cosmic microwave background

1993PhRvL..71...20S
STEVENS, D.;SCOTT, D.; SILK, J.
0.284 7/93
Microwave background anisotropy in a toroidal universe

1993PhRvL..70.2224D
DODELSON, S.;JUBAS, J. M.
0.284 4/93
Microwave anisotropies in the light of the

Item 4 (Domesticated species and varieties), especially ex-situ collections, are not covered by the EAP.

Aspects of coverage:
While the EAP emphasizes Conservation and Sustainable Use,
Equity and Ethical, cultural, scientific dimensions are not emphasized as much as they will be in the NBSAP.
Economic dimensions are stressed upon, but the NBSAP might want to shift the focus of the dialogue from stressing upon the supremacy of market forces to other factors which necessitate conservation.

B. Is this coverage adequate in terms of the points that an Action Plan should contain?

In terms of the points that an Action Plan should contain (please refer to the process outline of the NBSAP for the list of indicators):

a) The issues/problems are stated adequately at a theoretical and macro level only.
b) 'Ongoing initiatives' of the Ministry of Environment and Forests (MOEF) and other Ministries have been listed. Indications from the respective Ministries with reference to the progress since 1993 *viv-a-vis* the initiatives enlisted in the report under the chapter entitled "Programmes" would be useful.
c) The EAP provides a list of organizations which need to be 'strengthened'. A review of the progress made by these organizations would be useful. Perhaps we could approach those who aren't already on the NBSAP's list of agencies for feed-back on work concluded since 1993. Other key actors have been discussed as 'sectors' but have not been singled out for action plans.
d) The EAP identifies the new economic climate (of the early 1990s - the 8th 5yr. Plan-) as the focal point around which the strategy and action plan should revolve. It emphasizes that economic reforms would lead to further industrialization, thus necessitating sustainable development. It thus addresses a new issue. While appreciating the expediency that is sought by this thrust of the EAP, the NBSAP needs to plug a sort of gap that has simultaneously been created by the EAP. The NBSAP might want to consider shifting the focus from reacting to market forces to influencing market forces. One positive indication on this front in the EAP is the reference to a conducive tax structure. The progress on this front, and further recommendations on how to influence political decision-making are issues that the NBSAP needs to deliberate upon.
e) Delineation of strategies- dealt with in general terms. No specific proposals on how to enhance ongoing initiatives- complete versions of the thematic reports of which only extracts are available might contain specific strategies.
f) A thematic prioritization has been made by the EAP. Measures/actions plans have been referred to in the extracts of the thematic reports that have been appended to the EAP. Complete versions of these reports are required. Information on the follow-up action taken based on the said reports is required, and will be useful.
g) Key elements needed for implementation, institutional structures, funds, expertise/human resources, policy/legal measures, monitoring etc. have been discussed. However, significant updates will have to be made by the NBSAP.
h) The EAP mentions potential projects which have been submitted for possible Capacity 21 support. This includes the strengthening and establishment of specific organizations. (see pages 139-141 of the EAP). There are no further specific project proposals.
i) No time-frame has been mentioned. In the preface, it is stated that the EAP is 'a dynamic document which will evolve with time'.

C. Which of the thematic and sub-thematic areas does the document cover?

The EAP is based on eleven thematic reports. The following list indicates which report(s) would be useful to each of the Thematic Working Goups (TWGs) of the NBSAP process:

1) EAP's
'Conservation of wetlands, coral reefs, mangroves' theme might be useful to the
NBSAP themes of
Wild biodiversity-animals, Wild biodiversity-plants, Natural aquatic ecosystems, Natural terrestrial ecosystems.
2) EAP's 'Forestry' theme might be useful to the NBSAP themes of
Livelihoods, lifestyles and biodiversity, Wild biodiversity- animals, Wild biodiversity-plants, Natural terrestrial ecosystems, Access, benefit sharing, IPRs.
3) EAP's 'Institutional Structures for Environmental Management and Training' might be

1987PhDT.....1R 0.340 1/87
RADFORD, S. J. E. Observations at millimeter wavelengths of small angular scale isotropy in the cosmic background radiation

1987MmSAI..58..333F 0.340 0/87
FABBRI, R.;NATALE, V. Large-scale anisotropies of the 3K radiation, the extragalactic infrared background and the IRAS source counts

1987iaf..meet.....S 0.340 10/87
STRUKOV, I. A.; The anisotropy of the microwave background -
SKULACHEV, D. P.; Space experiment \'Relict\'
KLYPIN, A. A.

1987eram....4..445M 0.340 0/87
MESZAROS, A.;MESZAROS, P. Isotropy of the X-ray background and the distribution of galaxies

1987AZh....64....1D 0.340 2/87
DOROSHEVA, E. I.; Anisotropy of the relic background radiation
NASELSKII, P. D. in the period of the secondary ionization of cosmological hydrogen

1987ApJ...315....1F 0.340 4/87
FABBRI, R.;LUCCHIN, F.; Multipole anisotropies of the cosmic
MATARRESE, S. background radiation and inflationary models

1986SvAL...12..175K 0.340 6/86
KOFMAN, L. A.;POGOSIAN, D. I.; The large-scale microwave-background
STAROBINSKII, A. A. anisotropy in unstable-particle cosmologies

1986Natur.323...42C 0.340 9/86
CHASE, S. T. Cosmic string, hydrodynamics and microanisotropies in the cosmic background radiation

1986ApJ...308..546A 0.340 9/86
ABBOTT, L. F.;SCHAEFER, R. K. A general, gauge-invariant analysis of the cosmic microwave anisotropy

1986ApJ...306..428B 0.340 7/86
BOND, J. R.;CARR, B. J.; Spectrum and anisotropy of the cosmic
HOGAN, C. J. infrared background

1986ApJ...301L...1Y 0.340 2/86
YAHIL, A.;WALKER, D.; The dipole anisotropies of the IRAS galaxies
ROWAN-ROBINSON, M. and the microwave background radiation

1986ApJ...300..463B 0.340 1/86
BAJTLIK, S.;JUSZKIEWICZ, R.; 2.7 K radiation and the isotropy of the
PROSZYNSKI, M.; universe
AMSTERDAMSKI, P.

1985SvA....29..607P 0.340 12/85
POLNAREV, A. G. Polarization and anisotropy induced in the microwave background by cosmological gravitational waves

1985PhRvL..54.2269V 0.340 5/85
VITTORIO, N.;SILK, J. Microwave background anisotropy and decaying-particle models for a flat universe

1989acfp.proc..421G 0.339 0/89
GALLI, D.;PALLA, F. Thermal coupling of the CMBR and the

useful to the NBSAP theme of
Education, awareness, training.

4) EAP's 'Environment Education' theme might be useful to the NBSAP theme of Education, awareness, training.
5) EAP's 'Biodiversity/Wildlife Conservation might be useful to the NBSAP themes of Wild biodiversity- animals, Wild biodiversity- plants, Access, benefit-sharing, IPRs, Domesticated Biodiversity(?)
6) EAP's 'Environment Impact Assessment' theme might be useful to the NBSAP theme of Technology, industry, biodiversity.
7) EAP's 'Natural Resources Accounting' theme might be useful to the NBSAP theme of Economic valuation and biodiversity and Access, benefit sharing, IPRs
8) EAP's 'Clean Technologies' theme might be useful to the NBSAP theme of Technology, industry, biodiversity.
9) EAP's 'Water Quality' theme might be useful to the NBSAP theme of Natural aquatic ecosystems.
10) EAP's 'Alternative Energy Action Plan' might be useful to the NBSAP theme of Livelihoods, lifestyles and biodiversity and Technology, industry, biodiversity.

D. What major gaps does the document leave in covering these themes and sub-themes?

The document does not deal with specific project proposals.

E. Does the document make recommendations for follow-up which could become important indictors or directions for the NBSAP process to head towards?

The EAP, in its chapter entitled 'Current Programmes' (pgs. 55-89), enlists 'Organizational' and 'Non-organizational' provisions which are intended to deal with various aspects, all of which are relevant to the NBSAP. Although some of these recommendations are not entirely specific in nature, the follow-up action needs to be looked into by the NBSAP.
The EAP's chapter entitled 'Programmes' (pgs. 142-160) enlists recommended strategies. The follow-up in terms of whether these recommendations have led to specific projects/execution required to be looked into

F. Would this document, in any way, contradict other existing action plans, national reviews, etc., a contradiction that the NBSAP process needs to take cognizance of?

No contradiction, except for considering a theoretical shift from the approach of being driven by prevailing market forces to the approach of altering market forces by influencing consumer behaviour.

G. Is there any indication of the process carried out in making this document, was it consultative, did it take on board all the relevant sectors of society…?

The process through which the EAP was formulated has already been described above under the heading of 'A brief description of the EAP'. The aim was for the process to be consultative in nature.
Two of the thematic reports indicate that questionnaires etc. were used to obtain opinions from larger numbers.
The National Workshop was held only after the draft interim EAP was finalized. This was attended by about 35 NGOs and experts.
It is interesting to note that the EAP specifically mentions, in Para. 1.22 of the Introduction (Pg. 17), that "It is noteworthy that the seven broad priority areas have been endorsed by the participants of this workshop though some of them had recorded their views on the manner in which these priority areas have to be addressed." This leaves one in doubt regarding the success of the participatory aspect of the EAP process.

OVERALL COMMENTS:

The NBSAP could avoid macro-strategy duplication by looking into the EAP.
The TWGs of the NBSAP should be provided with the relevant thematic reports to use as 'background information'

Therefore it is not possible to predict the average time necessary to complete the phase transition from purely classical considerations. On the other hand quantum theory provides the fluctuations necessary to drive the transition. Indeed, equations (92)–(95) contain the necessary quantum fluctuations and it is possible to study the dynamics of symmetry breaking using them.

For simplicity we concentrate on the spatially uniform and isotropic solutions. In that case functions f depends only on $|p|$; they do depend neither on q nor on the direction of the momentum p. The potential U is also uniform and our evolution equations (92)–(95) reduce to:

$$\frac{\partial}{\partial t} f_0 = 0, \tag{103}$$

$$\frac{\partial}{\partial t} f_1 = \frac{p^2}{m}(f_2 + f_3) + 2m f_2 + \frac{U(t)}{m}(f_2 + f_3), \tag{104}$$

$$\frac{\partial}{\partial t} f_2 = -\frac{p^2}{m} f_1 - 2m f_1 - \frac{U(t)}{m} f_1, \tag{105}$$

$$\frac{\partial}{\partial t} f_3 = \frac{p^2}{m} f_1 + \frac{U(t)}{m} f_1. \tag{106}$$

Note that f_0 decouples completely from the rest of the system and does not undergo any evolution.

The time dependent scalar potential is chosen to be:

$$U(t) = -M^2 \theta(t - t_0) + \lambda \int \frac{d^3p}{(2\pi)^3}(f_2 + f_3) + C. \tag{107}$$

The first term is some external potential that is switched on (rapidly) at $t = t_0$. If $M^2 > m^2$ it will change the sign of a "mass squared term" inducing the transition towards new equilibrium. The second term describes a mean field self-coupling of $|\phi^4|$ type. It is well known that for $\lambda > 0$ this type of interaction will tend to stabilise the system. In addition we have a constant C; its value will be specified in a moment.

As an initial condition we assume the free vacuum state with distribution functions given by Eq. (72) i.e.,

$$f_0^{t=-\infty} = 0, \qquad f_1^{t=-\infty} = 0,$$
$$f_2^{t=-\infty} + f_3^{t=-\infty} = \frac{m}{E_p}, \qquad f_3^{t=-\infty} - f_2^{t=-\infty} = \frac{E_p}{m}, \tag{108}$$

The NBSAP should be careful to make specific project proposals
The NBSAP should be constantly aware of the fact that the sources of statistics provided should be recorded.
The NBSAP process should look into follow-up action that might have taken place as envisaged in the chapters on 'Current Programmes' and 'Programmes'

29th. April, 2000.
V. Shruti Devi.

1992Ap&SS.191..259B
BISNOVATYI-KOGAN, G. S.;
DEMIANSKI, M.

0.340 5/92
Distortion of the spectrum of the microwave background radiation in an anisotropic universe

1992A&A...264..385F
FENG, L. L.;LIU, J. M.

0.340 10/92
Gravitational optical scintillation and anisotropy of the cosmic microwave background

1991ApJ...383L...1K
KASHLINSKY, A.

0.340 12/91
Microwave background anisotropies implied by large-scale galaxy correlations - The minimum of C(0) and cosmological parameters

1991ApJ...373L..35N
NAMBU, Y.;ISHIHARA, H.;
GOUDA, N.;SUGIYAMA, N.

0.340 6/91
Anisotropies of the cosmic background radiation by domain wall networks

1991ApJ...366L..51M
MASI, S.;DE BERNARDIS, P.;
DE PETRIS, M.;EPIFANI, M.;
GERVASI, M.

0.340 1/91
High-latitude galactic emission and the search for anisotropies of the cosmic background radiation

1990PhDT.....9M
MYERS, S. T.

0.340 0/90
A search for anisotropy in the cosmic microwave background on angular scales of 1 to 30 arcminutes

1990ApJ...365..432S
SUGIYAMA, N.;GOUDA, N.;
SASAKI, M.

0.340 12/90
Constraints on universe models with cosmological constant from cosmic microwave background anisotropy

1989PhDT.....8H
HOLTZMAN, J. A.

0.340 0/89
Large scale structure and microwave background anisotropies in cosmological models and stellar photometry techniques with the wide field/planetary camera of the Hubble space telescope

1989nntra.571..205M
MYERS, S. T.;
READHEAD, A. C. S.;
LAWRENCE, C. R.

0.340 0/89
A new limit on the anisotropy of the microwave background radiation on arcminute scales

1989ApJ...339L...1F
FUKUGITA, M.;UMEMURA, M.

0.340 4/89
Upper limit on the cosmological baryon density from the cosmic background radiation anisotropies in the cold dark matter-dominated universe

1988prun.proc..141H
HOGAN, C. J.;BOND, J. R.

0.340 0/88
Origin and anisotropy of the cosmic submillimeter background

1988gteu.book..257D
DE BERNARDIS, P.;MASI, S.;
MORENO, G.

0.340 0/88
Anisotropy measurements of the microwave background

1988ApJ...334....1P
PANEK, M.

0.340 11/88
The large-scale microwave background anisotropy in decaying particle cosmology

1987S&W....26..206S
STICKEL, M.

0.340 4/87
The anisotropy of the cosmic-ray background

Draft by Shruti Devi, 29.4.2000

NBSAP Review Document
Environment Action Programme (EAP) - 1993

A brief description of the EAP:

The objectivs of the EAP were to:

a) assess the environment scene in India against the backdrop of the changing economic policies and programmes;
b) review the current policies and programmes which address the various environmental problems of the country;
c) identify the future direction and thrust of these policies and programmes to establish priorities and outline a strategy for the implementation of these priorities;
d) identify programmes and projects for a sustained flow of investment resources for improved provisioning of environmental services for better quality of life and for integrating environmental concerns into development projects; and
e) identify projects for organizational strengthening for better environmental management.

The EAP also identified seven top priority areas which included

a) conservation and sustainable utilization of biodiversity in selected eco-systems including forests, mangroves, wetlands, coral reefs, mountain ecosystems;
b) afforestation, waste lands development and conservation of soil and moisture and ensuring that water sources were not polluted;
c) control of industrial and related pollution with an accent on the reduction and/or management of wastes, particularly hazardous wastes;
d) improving access to clean technologies;
e) tackling urban environmental issues;
f) strengthening scientific understanding of environmental issues, as well as structures for training at different levels, orientation and creating environmental awareness, resources assessment, water management problems etc.; and
g) an alternative energy plan.

The process through which the EAP was formulated:

1) The Ministry of Environment and Forests was the nodal agency for conducting the EAP exercise. (Financial assistance: UNDP)
2) The MOEF constituted an EAP Implementation Committee which comprised the Ministries and Departments of the Govt. of India which were concerned with relevant sectoral issues.
3) The making of thematic reports was assigned to 'non-governmental institutes of academic excellence'.
4) These institutes were invited to participate in the meetings of the Implementation Committee.
5) A draft interim EAP document was finalized in Nov., 1992.
6) It was after this that a National Workshop was held. It was attended by about 35 NGOs. The draft EAP document was thus prepared and submitted for inter-Ministerial discussions after which the document was finalized.

Imp - if any lessons from its working? (ask Shekhar for tips)

The EAP is structured as follows:
1.Introduction. 2.Status of the Environment. 3.Natural Resources. 4.India's Legal and Organizational Framework for Environmental Management. 5.Current Programmes. 6.Diagnosis. 7.Priorities. 8.Strategy. 9.Programmes. -Figures and Tables-.

A Comparative Analysis of the EAP and the Proposed NBSAP

A. How much or which of the NBSAP scope and coverage points does the document cover?

Items 1 and 2 (Natural ecosystems and 'Wild' species and varieties) are covered by the EAP.
Item 3 (Agricultural ecosystems) falls within the purview of some of the discussion, but it is not a prioritized concern of the EAP.

1996 was supposed to be a review of the EAP — ask MoEF ?

The report said that to replace ... ageing It was stated that the strength of this force was Dockyard neers.

National Museum of Natural History

(Ministry of Environment & Forests)

INTERNATIONAL BIOLOGICAL DIVERSITY DAY

29th December, 1999



On-the-Spot Painting Competition

for Children

on 24th December, 1999

at 10.00 am

- Two Age Groups (I) - 8-12 yrs
  (II) - 13-17 yrs
- Attractive prizes
- Visit to a Biosphere Reserve for first three winners.

Open Quiz Competition

for Schools

on 24th December, 1999

at 12.30 pm

- Each School to nominate 2 students in 14 to 17 yrs. of age
- Selection/ elimination through oral and visual rounds.
- Attractive prizes
- First three winning teams will be taken for a visit to a Biosphere Reserve.

Venue : Museum Premises, Barakhamba Road, New Delhi-110001

Register at museum reception by 23-12-1999

For registration : Curator (Edu.), NMNH Barakhamba Road, New Delhi-110001,
Ph.: 3319173, 3314849

davp 6706/10/99

Draft by Shruti Devi, 29.4.2000

Item 4 (Domesticated species and varieties), especially ex-situ collections, are not covered by the EAP.

Aspects of coverage:
While the EAP emphasizes Conservation and Sustainable Use,
Equity and Ethical, cultural, scientific dimensions are not emphasized as much as they will be in the NBSAP.
Economic dimensions are stressed upon, but the NBSAP might want to shift the focus of the dialogue from stressing upon the supremacy of market forces to other factors which necessitate conservation.

B. Is this coverage adequate in terms of the points that an Action Plan should contain?

In terms of the points that an Action Plan should contain (please refer to the process outline of the NBSAP for the list of indicators):

a) The issues/problems are stated adequately at a theoretical and macro level only.
b) 'Ongoing initiatives' of the Ministry of Environment and Forests (MOEF) and other Ministries have been listed. Indications from the respective Ministries with reference to the progress since 1993 *viv-a-vis* the initiatives enlisted in the report under the chapter entitled "Programmes" would be useful.
c) The EAP provides a list of organizations which need to be 'strengthened'. A review of the progress made by these organizations would be useful. Perhaps we could approach those who aren't already on the NBSAP's list of agencies for feed-back on work concluded since 1993. Other key actors have been discussed as 'sectors' but have not been singled out for action plans.
d) The EAP identifies the new economic climate (of the early 1990s - the 8th 5yr. Plan-) as the focal point around which the strategy and action plan should revolve. It emphasizes that economic reforms would lead to further industrialization, thus necessitating sustainable development. It thus addresses a new issue. While appreciating the expediency that is sought by this thrust of the EAP, the NBSAP needs to plug a sort of gap that has simultaneously been created by the EAP. The NBSAP might want to consider shifting the focus from reacting to market forces to influencing market forces. One positive indication on this front in the EAP is the reference to a conducive tax structure. The progress on this front, and further recommendations on how to influence political decision-making are issues that the NBSAP needs to deliberate upon.
e) Delineation of strategies- dealt with in general terms. No specific proposals on how to enhance ongoing initiatives- complete versions of the thematic reports of which only extracts are available might contain specific strategies.
f) A thematic prioritization has been made by the EAP. Measures/actions plans have been referred to in the extracts of the thematic reports that have been appended to the EAP. Complete versions of these reports are required. Information on the follow-up action taken based on the said reports is required, and will be useful.
g) Key elements needed for implementation, institutional structures, funds, expertise/human resources, policy/legal measures, monitoring etc. have been discussed. However, significant updates will have to be made by the NBSAP.
h) The EAP mentions potential projects which have been submitted for possible Capacity 21 support. This includes the strengthening and establishment of specific organizations. (see pages 139-141 of the EAP). There are no further specific project proposals.
i) No time-frame has been mentioned. In the preface, it is stated that the EAP is 'a dynamic document which will evolve with time'.

C. Which of the thematic and sub-thematic areas does the document cover?

The EAP is based on eleven thematic reports. The following list indicates which report(s) would be useful to each of the Thematic Working Goups (TWGs) of the NBSAP process:

1) EAP's
'Conservation of wetlands, coral reefs, mangroves' theme might be useful to the
NBSAP themes of
Wild biodiversity-animals, Wild biodiversity-plants, Natural aquatic ecosystems, Natural terrestrial ecosystems.
2) EAP's 'Forestry' theme might be useful to the NBSAP themes of
Livelihoods, lifestyles and biodiversity, Wild biodiversity- animals, Wild biodiversity-plants, Natural terrestrial ecosystems, Access, benefit sharing, IPRs.
3) EAP's 'Institutional Structures for Environmental Management and Training' might be

World Headquarters

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CH-1196 Gland

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IUCN
The World Conservation Union

WCPA Members

Ref: 6.1

December 1999

Dear WCPA members,

Please find enclosed:

1. The PARKS Magazine issue on the Management Effectiveness of Protected Areas and WCPA Newsletter number 78. As always, any feedback or suggestions would be most welcome.

2. A letter from the IUCN Director General regarding the 2nd IUCN World Conservation Congress in Amman, Jordan in October 2000. If you are planning to attend the WCPA meeting which will be held at the Congress (3 and 4 October), please complete the attached form and send back to IUCN by 31 January 1999.

3. The Short Term Action Plan for WCPA over the period 1999-2002: This Plan updates the existing WCPA Strategic Plan previously sent to all WCPA members and aims to provide a framework for WCPA activities into the next century. A Plan of this kind is needed to ensure that WCPA focuses on priorities and uses its resources to best effect. The Plan responds to two major reviews undertaken recently by WCPA:

   - an "external" review, conducted for the Albany symposium (November 1997) which reviewed the context of protected areas in today's society, and specifically progress since Caracas; and

   - and the "internal" Crofts/Lahmann review which examined how the structures and processes of WCPA/PPA could be improved.

   The Plan will be reviewed and, if necessary, amended after the 2000 World Conservation Congress.

4. And, some other materials that may be of interest.

With kind regards,

David Sheppard

Adrian Phillips

Printed on Chlorine-free pap

useful to the NBSAP theme of
Education, awareness, training.

4) EAP's 'Environment Education' theme might be useful to the NBSAP theme of Education, awareness, training.
5) EAP's 'Biodiversity/Wildlife Conservation might be useful to the NBSAP themes of Wild biodiversity- animals, Wild biodiversity- plants, Access, benefit-sharing, IPRs, Domesticated Biodiversity(?)
6) EAP's 'Environment Impact Assessment' theme might be useful to the NBSAP theme of Technology, industry, biodiversity.
7) EAP's 'Natural Resources Accounting' theme might be useful to the NBSAP theme of Economic valuation and biodiversity and Access, benefit sharing, IPRs
8) EAP's 'Clean Technologies' theme might be useful to the NBSAP theme of Technology, industry, biodiversity.
9) EAP's 'Water Quality' theme might be useful to the NBSAP theme of Natural aquatic ecosystems.
10) EAP's 'Alternative Energy Action Plan' might be useful to the NBSAP theme of Livelihoods, lifestyles and biodiversity and Technology, industry, biodiversity.

D. What major gaps does the document leave in covering these themes and sub-themes?

The document does not deal with specific project proposals.

E. Does the document make recommendations for follow-up which could become important indictors or directions for the NBSAP process to head towards?

The EAP, in its chapter entitled 'Current Programmes' (pgs. 55-89), enlists 'Organizational' and 'Non-organizational' provisions which are intended to deal with various aspects, all of which are relevant to the NBSAP. Although some of these recommendations are not entirely specific in nature, the follow-up action needs to be looked into by the NBSAP.
The EAP's chapter entitled 'Programmes' (pgs. 142-160) enlists recommended strategies. The follow-up in terms of whether these recommendations have led to specific projects/execution required to be looked into

F. Would this document, in any way, contradict other existing action plans, national reviews, etc., a contradiction that the NBSAP process needs to take cognizance of?

No contradiction, except for considering a theoretical shift from the approach of being driven by prevailing market forces to the approach of altering market forces by influencing consumer behaviour.

G. Is there any indication of the process carried out in making this document, was it consultative, did it take on board all the relevant sectors of society…?

The process through which the EAP was formulated has already been described above under the heading of 'A brief description of the EAP'. The aim was for the process to be consultative in nature.
Two of the thematic reports indicate that questionnaires etc. were used to obtain opinions from larger numbers.
The National Workshop was held only after the draft interim EAP was finalized. This was attended by about 35 NGOs and experts.
It is interesting to note that the EAP specifically mentions, in Para. 1.22 of the Introduction (Pg. 17), that "It is noteworthy that the seven broad priority areas have been endorsed by the participants of this workshop though some of them had recorded their views on the manner in which these priority areas have to be addressed." This leaves one in doubt regarding the success of the participatory aspect of the EAP process.

OVERALL COMMENTS:

The NBSAP could avoid macro-strategy duplication by looking into the EAP.
The TWGs of the NBSAP should be provided with the relevant thematic reports to use as 'background information'

In the future, municipal water demand will always be of first priority. It becomes quite clear that a worldwide reallocation of water supplies will have to take place. In many cases there will be a transformation of irrigation water sources in favour of domestic and industrial uses. Agriculture and especially the irrigation sector, being at present the main water user, will have to get along with less and less water in the years to come – water that could be increasingly of marginal quality.

However, developing countries are beginning to follow western production philosophies, shifting from land-extensive farming to land-intensive agriculture, well aware that they will in future be dependent on external inputs and on the introduction of cost reducing technologies. But future increases in output will be gained from the same resources, placing an even greater emphasis on yield increases. The critical question which remains unanswered is: Can technology continue to generate the yield increases required in the future? This question is further complicated by concerns about the sustainability of agricultural development in the Third World, the shortage of unoccupied and suitable land, and the availability of adequate water supplies to meet projected future requirements.

The mechanism of poverty and overpopulation is well understood and documented. Nevertheless, we have not been able to adjust the number of people to the population supporting capacity of the land in those regions of the world which are most prone to famine and resource misuse. Technical and economical instruments, like irrigation development and subsidy, have not brought any relief to the tense situation in these often resource lacking, marginal areas, because such measures generate too small an advantage per capita in the long run; in addition, they fail to provide equal opportunities within and among supported regions due to the pronounced variable nature of ecosystems. This causes the "poor guy" to react as always, securing his well-being by a greater number of descendants. Therefore, if we do not want to exert pressure, our only chance is to provide every individual with an outlook for a sustained fair income in order to change his reproductive behaviour. *But how?* The answer might well be a prize-winning one.

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YUDELMAN, M. (1994): Demand and supply of foodstuffs up to 2050 with special reference to Irrigation. – IIMI Review Vol. 8 (No. 1), 4–14.

Authors' address: Prof. Dr. Peter Wolff, Fachgebiet Kulturtechnik und Ressourcenschutz, Fachbereich 11, Universität Gesamthochschule Kassel, Nordbahnhofstraße 1a, D-37213 Witzenhausen.

Draft by Shruti Devi, 29.4.2000

The NBSAP should be careful to make specific project proposals ? Not clear

The NBSAP should be constantly aware of the fact that the sources of statistics provided should be recorded.

The NBSAP process should look into follow-up action that might have taken place as envisaged in the chapters on 'Current Programmes' and 'Programmes'

29th. April, 2000.
V. Shruti Devi.

Bombay Natural History Society

Founded 1883

PATRON
SHRI K. R. NARAYANAN
PRESIDENT OF INDIA

PRESIDENT
B. G. DESHMUKH
I. A. S. (Retd.)

Ref:390/2000 24TH January 2000

All Members of the National Wildlife Action Plan Committee

Dear Sir/Madam,

At the instance of the President of the Society, Mr B G Deshmukh I enclose a copy of "Reshaping National Forest Policy" by H Michael Anderson.

Yours sincerely,

J C Daniel
Honorary Secretary

Shri S C Sharma, Addl. IGF(WL), MoEF
Shri H S Panwar
Shri M K Ranjitsinh, WWF, New Delhi
Shri P Pushp Kumar, CZA, New Delhi
Shri Bittu Sahgal, Sanctuary Magazine
Shri Ashish Kothari, Kalpavriksha
Shri Mahender Vyas
Ms Pratibha Pande, IIPA
Shri Sharad Gaur, Represent Sh. Samar Singh, WWF India
Shri M Satyanarayanan DIG(WL), MoEF

Encl:a/a.

Hornbill House, Dr. Sálim Ali Chowk, Shaheed Bhagat Singh Road, Mumbai - 400 023
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Director: bnhs@bom3.vsnl.net.in

TWG General 5.18.1 \ Them Doc \ Review of Implementation of Article 6 \ Ver. 1 B.T.

NBSAP Review Document
IMPLEMENTATION OF ARTICLE 6 OF THE CONVENTION ON BIOLOGICAL DIVERSITY IN INDIA, 1998

Bansuri

A. Introduction

The report on the Implementation of Article 6 of the Convention on Biological Diversity in India (henceforth "National Report") was published in 1998 by the MoEF. It was prepared by the MSSRF, Chennai. This report outlines, in a format consonant with the three main provisions of the CBD, the policies, programmes and developments relating to Biodiversity Conservation in the country, especially after India signed the CBD.

As it is not in the form of an action plan document, its overlap with the NBSAP is not obvious. it does, however, contain extensive information that can be used in the preparation of various APs envisaged under the NBSAP.

B. Assessment

1. Scope:

The National Report covers both wild and domesticated biodiversity, wild biodiversity at the ecosystem level as well as at the species level. Domesticated biodiversity is covered at the species and genetic variation levels.

Issues of conservation and sustainable use are both covered by the National Report, and equity is dealt with under a section on access and benefit sharing provisions. Scientific dimensions are well covered, though economic dimensions are not. Cultural aspects also receive some metnion. *Gender concerns are not dealt with.*

what kind?

Cross sectoral issues are dealt with as a separate section of the report.

2. Does the document contain the elements of an action plan as laid out in the process outline?

The National Report is not a statement of future actions, rather a documentation of what has already been done. It does not therefore contain most of the features of an action plan. Only ongoing initiatives and key actors have been identified.

3. Themes and sub-themes

The National Report contains information relevant to many of the thematic areas and also to the other working groups. In order of the thematic area, the information and relevant page number in the report are listed below:

Economics and valuation	
Livelihoods	1. Traditions and lifestyles pertaining to conservation- p. 1
Health	1.Listing of texts with reference to medicinal plants- p. 41
Culture	2. Traditions of conservation- p. 1
Domesticated[1]	1. *Ex situ* and *in situ* conservation- p. 16 2. NBAGR, NBPGR, NBFGR- p. 18, 20, 24,25 3. Indian National Gene Bank-p. 21 4. Germplasm facilities- p. 23, 29 5. Threatened breeds of animals' list- p. 30
Wild- animals	1. species –specific programmes- p. 10 2. Zoos- p. 17

Useful such tables needed for all taxa.

[1] Some institutes and information pertinent to Domesticate biodiversity also have experience with /collections of wild biodiversitv. For the sake of brevitv. thev are listed onlv under the former here.

From SINGH@tifrvax.tifr.res.in Wed Jan 8 18:35:04 1997
From: "K. P. SINGH" <SINGH@tifrvax.tifr.res.in>
To: nabhan@iucaa.ernet.in
Subject: Re: Coorg details....
Date: Wed, 8 Jan 1997 18:25 +0530

Dear Paddy,
Thanks for the invitation for the Coorg meeting.
I accept the invitation and look forward to the meeting.
Could u tell me with whom I should co-ordinate my talk ?

Regards
- K P

Wild- plants	1. Medicinal Plant conservation areas- p. 15
Natural terrestrial ecosystems	1. PA network- p. 9 2. Biosphere reserves- p. 13 3. Inventorying and programmes- p.33,34, 36
Natural aquatic ecosystems	1. Inventorying and programmes--p.32,35
Micro-organismic diversity	1. microbial tissue collection, blue-green algal collection- p. 23 2. Inventorying- p. 36
Policies, laws and institutions	1. Acts relevant to biodiversity- p. 4 2. Major Programmes of the MoEF –p. 6 3. Legal instruments relevant to biodiv- p. 47
ABS and IPR	Section on ABS-p. 41
Education, Awareness, Training and research	1. Monitoring and databases- p. 27[2] 2. Academic programmes- p. 36 3. Public education and awareness- p. 38
Technology & Industry	1. Linkages with commercial sector- p. 52 2. Impact assessment programmes- p. 39

International conventions – p. 5

3. Cross sectoral issues

Cross sectoral issues are covered in the National report as under:
Relevant programmes in other ministries- p. 8
Section on cross-sectoral linkages (Government, non-government, Academic and commercial sector) - p. 46

4. Lacunae:

The role of communities in conservation is given only cursory treatment, and the first four thematic areas listed above are not examined in any detail.

Cross-sectoral is weak

5. Loci of support to NBSAP:

Certain completed Action Programmes are mentioned in the National report, and brief statements of their recommendations are made on p. 46. e.g. National Conservation Strategy and Policy Statement on Environment and Sustainable Development, 1992. Most of these documents are being separately reviewed by the TPCG.

6. Process of preparation

The National Report was prepared by the MSSRF, Chennai, with support from text sources, and inputs from 30 Indian NGOs, Institutions and individuals.

Overall, does the document point to a way forward?

The National Report identifies some of the major institutional efforts in the conservation of biodiversity, particularly in ex-situ conservation. It provides some information of actors and initiatives which can be tapped and built on while developing the NBSAP.

[2] This information is arranged according to eco-system types: e.g. marine biodiversity, forest biodiversity

CEC

Consortium for Educational Communication
(An Autonomous Institution of University Grants Commission on Electronic Media)

Prof. M.M. Chaudhri
Director
CEC & Education International

Ref: 7.5

December 23, 1998

By Courier/ Speed Post

Dear Prof. Padmanabhan,

The Chairperson, UGC in her capacity as the Chairperson of the Forum of IUC is convening a "Brain Storming Session" on the Inter-University Centres on Wednesday, December 30, 1998 at IUCAA, Pune. The Chairperson has desired that for this session useful material, in advance, can be circulated to the participants. I am enclosing the CEC material for your perusal.

With kind regards,

Yours sincerely,

(M.M. CHAUDHRI)

Encl:- As above.

Prof. T. Padmanabhan,
Dean, Core Academic Programmes,
IUCAA, Post Bag 4,
Ganeshkind,
PUNE-411 007.

Review of National Report on Implementation of Article 6 (Marine issues)

MVM Wafar

Introduction:

The document "National report on the Implementation of article 6 of the Convention on Biological Diversity in India" was commissioned by the Ministry of Environment and Forests. The document was prepared by the M. S. Swaminathan Research Foundation, Chennai and submitted to the Ministry of Environment and Forests in 1998.

Article 6 of CBD stipulates that each Contracting Party develops National Strategies, Plans and Programs for the conservation and sustainable use of biological diversity or adapts for this purpose existing strategies, plans or programs which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and integrates as far as possible and as appropriate, the conservation and sustainable use of biodiversity in the relevant sectoral or cross-sectoral plans, programs and policies. This report highlights how existing the policies and programs of the MoEF conform to the requirement of Article 6. This is organized in 4 chapters:

- Conservation and sustainable use of biological diversity in India - cornerstones
- Conservation and sustainable use policy
- Access to bio resources, benefit sharing and incentives
- Integrating biodiversity concerns in sectoral program.

Assessment of the relationship of this document in the NBSAP

1. How much or which of the NBSAP scope and aspects does the document cover?

   The document is comprehensive, listing all the programs at levels ranging from eco-regions (ex. desert biodiversity) through state (PFM in West Bengal, National bureaus of gene banks to natural and the institutional mechanism existing to carry out these.

   This document does not itself present any strategy or action plan but those listed in the document could prove useful to the NBSAP during the preparation of LSAP, SSAP, ISAP, NSAP and TSAP. One cannot also fail to note that practically none of the programs listed call for participatory action as the NBSAP envisages now.

2. Is this coverage adequate in terms of the points that an Action Plan should contain?

   Because of the nature of document and the terms of its commission, points 1-3 (Statement of the issue or issue and identification of by actors involved) only are covered.

By its nature, this is a status report but not a strategy paper or an action plan document

3. Which of the thematic and sub-thematic areas does the document cover?
   Direct mention is made of

- Wetland biodiversity (read natural aquatic ecosystems)
- Microbial biodiversity

These are only very brief. For example, the microbial biodiversity is treated in exactly 91 words.

4. What major gaps does the document leave in covering these themes and sub-themes?

1992Natur.357..660W
WATSON, R. A.;
DE LA CRUZ, C. M. G.;
DAVIES, R. D.;LASENBY, A. N.;
REBOLO, R.;BECKMAN, J. E.;
HANCOCK, S.

0.220 6/92
Anisotropy measurements of the cosmic microwave background radiation at intermediate angular scales

1992N93-24633.....R
RUPPERSBERG, G. H.;
BULL, R. H.

0.220 8/92
Anisotropic reflections in mountainous terrain to determine the absorption of solar radiation from satellite data

1992N93-18717.....F
FISCHER, M. L.;ALSOP, D. C.;
CHENG, E. S.;CLAPP, A. C.;
COTTINGHAM, D. A.;
GUNDERSEN, J. O.;KOCH, T. C.;
KREYSA, E.;MEINHOLD, P. R.;
LANGE, A. E.

0.220 12/92
A bolometric millimeter-wave system for observations of anisotropy in the cosmic microwave background radiation on medium angular scales

1992N92-25504.....E
EVANS, T.

0.220 5/92
A search for the dipole anisotropy of the Cosmic x ray background

1992MNRAS.258...71K
KLYPIN, A. A.;STRUKOV, I. A.;
SKULACHEV, D. P.

0.220 9/92
The Relikt missions - Results and prospects for detection of the microwave background anisotropy

1992MNRAS.258...1PE
EFSTATHIOU, G.;BOND, J. R.;
WHITE, S. D. M.

0.220 9/92
COBE background radiation anisotropies and large-scale structure in the universe

1992issacproc..345B
BOTTANI, S.;DE BERNARDIS, P.;
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MELCHIORRI, B.;MELCHIORRI, F.;
TANZILLI, P.

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Cosmic background anisotropies in the millimetric region

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GUNDERSEN, J.;KOCH, T.;
SEIFFERT, M.;MEINHOLD, P.;
LUBIN, P.

0.220 10/92
A degree-scale measurement of anisotropy of the cosmic background radiation

1992ApJ...384L...1B
BOTTANI, S.;DE BERNARDIS, P.;
MELCHIORRI, F.

0.220 1/92
On the origin of the dipole anisotropy as determined by quadrupole measurements

1991PhDT.....7A
ALSOP, D. C.

0.220 0/91
The millimeter and submillimeter wavelength diffuse backgrounds: Measurements of the spectrum and anisotropy

1991PhDT.....3F
FISCHER, M. L.

0.220 0/91
A search for anisotropy in the cosmic background radiation at millimeter wavelengths on angular scales from 0.3 to 3 degrees

1991N93-17647.....S
STORINI, M.;IUCCI, N.;
PASE, S.

0.220 3/91
North-south anisotropy during the quasi-stationary modulation of galactic cosmic rays

1991iraa...11..261M

0.220 0/91

The document lists only the existing programs on biodiversity conservation, does not analyze them.

5. Does the document make recommendation for follow up, which could become important indicators or directions for the NBSAP process to head towards?

   None

6. Would this document in any way contradict other existing action plans, national reviews etc, a contradiction that the NBSAP process needs to take cognizance of?

   There is no contradiction. But the document serves a very useful purpose. Even though the resume of the number of projects and policies and biodiversity conservation action plans is brief, it does go to show that not many of them have the elements of participation at all levels included in them. This does help to reinforce the NBSAP (not by presence but by absence!)

7. Is there any indication of the process carried out in making this document, was it consultative, did it take on board all the relevant sectors of the society? If there is, are there some obvious major gaps, which the NBSAP process can plug? Or is there no indication of the process at all?

   The process is literature survey. Source of information is primarily MoEF documents. As the report is not expected to be analytical, it could not have taken others into consultation.

Summary:

This report is a source of information on programs and policies of the MoEF existing on conservation and sustainable use of biodiversity. The chairman and members of the thematic working group may final it useful to consult this.

1990ApJ...348...33C CLINE, D. B.;GAO, Y.	0.284	1/90 Fine-scale anisotropy of cosmic gamma-ray background to identify the underlying generation process
1988prun.proc..163P PANEK, M.	0.284	0/88 Large-scale microwave background anisotropies in cosmological models with exotic components
1988AZh....65..449N NOVOSIADLYI, B. S.; PELYKH, V. A.	0.284	6/88 Spherically symmetric perturbations of matter density and velocity in the isotropically expanding dust universe
1988ApJ...326..517L LINDER, E. V.	0.284	3/88 Microwave background anisotropy induced by gravitational waves
1988A&A...206..199L LINDER, E. V.	0.284	11/88 Isotropy of the microwave background by gravitational lensing
1987dmu..symp..379L LUKASH, V. N.	0.284	0/87 Anisotropy of the microwave background and cosmological dark matter
1987ApJ...315...12F FABBRI, R.;ANDREANI, P.; MELCHIORRI, F.;NISINI, B.	0.284	4/87 The large-scale anisotropies of the extragalactic infrared background
1986isosibook..138P PARTRIDGE, R. B.	0.284	0/86 Very small scale anisotropies of the microwave background
1986ApL....25...25R RAINE, D. J.;THOMAS, E. G.	0.284	0/86 The quasi-isotropic universe and the microwave background
1985SvAL...11..271K KOFMAN, L. A.; STAROBINSKII, A. A.	0.284	10/85 Effect of the cosmological constant on large-scale anisotropies in the microwave background
1985ApJ...299L..71B BONOMETTO, S. A.; VALDARNINI, R.	0.284	12/85 Microwave background anisotropies, large-scale peculiar velocity fields, and clustering evolution in a warm-hot dark matter cosmological model
1985ApJ...293L...1V VITTORIO, N.;SILK, J.	0.284	6/85 Scale-invariant density perturbations, anisotropy of the cosmic microwave background, and large-scale peculiar velocity field
1992PhRvL..69.1856D DAVIS, R. L.;HODGES, H. M.; SMOOT, G. F.; STEINHARDT, P. J.; TURNER, M. S.	0.271	9/92 Cosmic microwave background probes models of inflation
1991pneeuproc..281S SMOOT, G. F.	0.271	0/91 COBE - New sky maps of the early universe
1991iraa...11..181M MATHER, J. C.;HAUSER, M. G.;	0.271	0/91 Early results from the Cosmic Background

Review of National Report on Implementation of Article 6
(Marine issues)

Club w. Banswals

MVM Wafar

Introduction:

The document "National report on the Implementation of article 6 of the Convention on Biological Diversity in India" was commissioned by the Ministry of Environment and Forests. The document was prepared by the M. S. Swaminathan Research Foundation, Chennai and submitted to the Ministry of Environment and Forests in 1998.

Article 6 of CBD stipulates that each Contracting Party develops National Strategies, Plans and Programs for the conservation and sustainable use of biological diversity or adapts for this purpose existing strategies, plans or programs which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned; and integrates as far as possible and as appropriate, the conservation and sustainable use of biodiversity in the relevant sectoral or cross-sectoral plans, programs and policies. This report highlights how existing the policies and programs of the MoEF conform to the requirement of Article 6. This is organized in 4 chapters:

- Conservation and sustainable use of biological diversity in India - cornerstones
- Conservation and sustainable use policy
- Access to bio resources, benefit sharing and incentives
- Integrating biodiversity concerns in sectoral program.

Assessment of the relationship of this document in the NBSAP

1. How much or which of the NBSAP scope and aspects does the document cover?

   The document is comprehensive, listing all the programs at levels ranging from eco-regions (ex. desert biodiversity) through state (PFM in West Bengal, National bureaus of gene banks to natural and the institutional mechanism existing to carry out these.

   This document does not itself present any strategy or action plan but those listed in the document could prove useful to the NBSAP during the preparation of LSAP, SSAP, ISAP, NSAP and TSAP. One cannot also fail to note that practically none of the programs listed call for participatory action as the NBSAP envisages now.

   IMP.

2. Is this coverage adequate in terms of the points that an Action Plan should contain?

   Because of the nature of document and the terms of its commission, points 1-3 (Statement of the issue or issue and identification of by actors involved) only are covered.

   Id. of ongoing activities also?

By its nature, this is a status report but not a strategy paper or an action plan document

3. Which of the thematic and sub-thematic areas does the document cover?
   Direct mention is made of

- Wetland biodiversity (read natural aquatic ecosystems)
- Microbial biodiversity

These are only very brief. For example, the microbial biodiversity is treated in exactly 91 words.

4. What major gaps does the document leave in covering these themes and sub-themes?

is mainly determined by the initial conditions. The manifestation of the nonlinear features will be seen in the higher–order correlation functions, or equivalently in the departure of the shape of the distribution functions from Gaussian distributions. We have now various tools at our disposal to study the mildly nonlinear regime in details, so that specific predictions can be made that are directly derived from first principles.

One of the most successful approximations to describe the early nonlinear dynamics is the Zel'dovich approximation (Zel'dovich 1970). In this approximation, the displacement of the particles is extrapolated from its behavior in the linear regime. The whole local statistical properties of the field at the position of a particle is then determined by the statistical properties of the initial displacement field. For Gaussian initial condition, it is possible, for instance, to compute the density PDF by a change of variable starting with the initial statistical properties of the displacement. Actually, as it will be recalled in this paper, a lot more statistical properties can be derived with such an approximation (Kofman 1991, Kofman et al. 1994).

The second method is based on the calculations of the large–scale cumulants of the cosmic field from perturbation theory. Indeed, when one assumes Gaussian initial conditions, it turns out that it is possible to derive the leading term (with respect to the rms density fluctuation) of each cumulant (Bernardeau 1992). These first order contributions are expected to dominate the exact value of the cumulants as long as the rms fluctuation is accurately given by the linear theory. The shape of the density PDF is then obtained by a reconstruction of this function from the generating function of the moments.

The mathematical forms of the density PDFs derived analytically in these two methods are quite different. We compare the forms of the PDFs derived in the quasi-linear regime earlier in our papers, and show its mutual agreement. As this subject is in rapid development, many questions and controversies on the density PDF and moments are accumulating in the literature. Therefore we try to clarify many points related to the PDFs, generating functions, moments and smoothing in the quasi-linear regime. Presumably, there is no simple universal formula for $P(\rho)$ in general. However, one of the practical outputs of our paper is to provide a justification for the use a log-normal distribution as a successful fit for the actual cosmic density PDF. This fit is only accurate for the cosmological models based on the Gaussian initial statistics and realistic power spectrum, but not in the general case. Another practical output is a new view on the measurement of the lowest moments - skewness and kurtosis. Common belief is that they are affected by the high density tail which is difficult to measure. We will demonstrate that these moments can be evaluated from the form of the PDF around its maximum.

We will use the concepts of moments, cumulants, PDFs and generating function throughout the paper. The formal definitions of all of them are collected in Appendix A. However, we must stress that the introduction of quantities such as the generating functions of moments and cumulants is not an extra mathematical exercise but an useful tool to find the measurable statistics of the cosmic fields. There is a deep connection between generating function and the non-linear evolution of the spherical overdense fluctuation in the dynamical model of the gravitational instability. Hence, in most cases the generating function can be derived directly from the dynamical equations. We will present the closed forms of the generating functions in different approximations in the quasi-linear regime.

Throughout this analysis we got a series of new results: the generating functions of cumulants and finite moments in the Zel'dovich approximation, both with and without final smoothing; two methods of reconstruction of cosmological density PDF from, correspondingly, the whole (Laplace transformation) and partial (Edgeworth decomposition) series of moments; systematic mutual comparison of all these methods and their comparison against the calculations from N-body simulation; the range of validity of their fitting by the log-normal distribution; the extension of the derivation of density PDF in the Zel'dovich approximation for an arbitrary initial condition.

Section 2 of the paper is devoted to the 1D dynamics, in which the mathematical content is simpler than for the 3D dynamics. We apply general methods and mathematical tools in this case. Section 3 is devoted to the statistical properties that can be derived from the use of the Zel'dovich approximation for the 3D dynamics. In Section 4, we give the properties of the exact dynamics derived from direct perturbative calculation in the single stream regime. Section 5 is devoted to comparisons with numerical simulations. In the conclusive Section 6 we summarize the approximations that have been made and the results in a detailed

The document lists only the existing programs on biodiversity conservation, does not analyze them.

5. Does the document make recommendation for follow up, which could become important indicators or directions for the NBSAP process to head towards?

   None

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   Imp. point coming from most reviews

7. Is there any indication of the process carried out in making this document, was it consultative, did it take on board all the relevant sectors of the society? If there is, are there some obvious major gaps, which the NBSAP process can plug? Or is there no indication of the process at all?

   The process is literature survey. Source of information is primarily MoEF documents. As the report is not expected to be analytical, it could not have taken others into consultation.

   ~~Also Ginnairs. Ask Ranjit. Daniels.~~ See B's review

Summary:

This report is a source of information on programs and policies of the MoEF existing on conservation and sustainable use of biodiversity. The chairman and members of the thematic working group may final it useful to consult this.

Need to pinpoint specific sections for each TWG/SSC. (see Bansuri's review)

1. INTRODUCTION

One of the goals of the study of the nonlinear gravitational dynamics in an expanding universe is the determination of the statistical properties of the various cosmic fields that can be used to describe the matter distribution and motion. In the linear regime, for Gaussian initial conditions, this description is quite easy since it reduces to the behavior of the two-point correlation function, or equivalently to the shape of the power spectrum. Once nonlinear effects are taken into account this is no longer the case and the mathematical description of the statistical properties is more complicated. One can basically distinguish two approaches to describe the statistics of the non-linearities.

The description of statistics in terms of the correlation functions has been investigated since '70s. In principle, a full knowledge of the matter field can be obtained from the shape of the p-point correlation functions (see Peebles 1980 for references). These functions are the solution of a hierarchy of dynamical equations, the BBGKY hierarchy. The spatial correlation functions have been measured in galaxy catalogues, or in numerical simulations. Progress was made to find a few low order correlation functions, theoretically, numerically and observationally (see Peebles 1993 for references). However, dynamical BBGKY equations have never been solved in general.

Another approach which drew much attention recently is based on the probability distribution function (PDF) of a cosmic field at a given point or PDFs at various points, or joint PDFs of several cosmic fields. The one-point density PDF, $P(\rho)\,\mathrm{d}\rho$, is the primary object of study in this approach. The discrete analogy of the one point PDF is given by counts in cell probabilities that is basically what is obtained after smoothing of the discrete field by a sharp filter. It is important to note that the PDFs contain more statistical information than a few lower order correlation functions. Actually the moments of the PDF are the spatial averages (with the same window functions) of the correlation functions.

In practice, galaxy PDFs have been measured in various catalogues by Hamilton (1985) and Alimi, Blanchard & Schaeffer (1990) in the CfA survey, Bouchet et al. (1993) Kofman et al. (1994) in the IRAS surveys, Maurogordato, Schaeffer & Da Costa (1992) in the SSRS survey, Gaztañaga & Yokoyama (1993) both in the SSRS and CfA survey. The density PDF manifests significant non-Gaussian features in non-linear and even in quasi-linear regimes. One central question theories have to address is to determine what part of this non-Gaussianity came from non-linear dynamics, what part came from possible non-Gaussian initial conditions, and what part came from the galaxy biasing.

To see what kind of density PDFs emerge from gravitational dynamics, investigations have been made in numerical simulations by Bouchet, Schaeffer & Davis (1991), Weinberg and Cole (1992), Bouchet & Hernquist (1993), Juszkiewicz et al. (1993), Kofman et al. (1994).

In this paper we concentrate on the theoretical basis for the derivation of the cosmic density PDF. There were phenomenological attempts in the literature *to design* $P(\rho)$ – see, for instance, Saslaw and Hamilton (1984); Coles and Jones (1991). Here we discuss *the derivation* of the density PDF from gravitational dynamics, and its comparison against numerical simulation. It is a difficult problem to derive $P(\rho)$ for the general case. However, it can be studied in different regimes and approximations. One can distinguish different successive stages of the non-linear gravitational dynamics: quasi-linear regime, non-linear regime, and highly non-linear regime. The quasi-linear (or mildly non-linear) regime when $\sigma < 1$ can be investigated by the mean of the perturbation theory, unlike other regimes. In the non-linear regime $\sigma > 1$ the complexity of the dynamics makes analytical studies virtually impossible. Highly non-linear regime when $\sigma \gg 1$ might take place when the hypothetic hierarchical ansatz for the correlation functions is working. Indeed, another feature of the gravitational dynamics – self-similar solution (Davis & Peebles 1977)– is expected to be reached in this regime. The statistics of this regime has been a subject of consideration in many papers. In particular Balian & Schaeffer (1989) give relations of crucial interest that relate the properties of one-point density PDF to the ones of the correlation functions.

In this paper, we rather concentrate on the statistics in the quasi-linear regime. Fortunately, a fair fraction of the observational data does correspond to such a regime when the galaxy surveys are smoothed with a large enough radius (say $\gtrsim 8h^{-1}\mathrm{Mpc}$). In the quasi-linear regime the two–point correlation function

Review of the Document "National Policy and Macrolevel Action Strategy on Biodiversity"

MVM Wafar

Introduction:

The document was commissioned by the Ministry of Environment and Forests and executed by the Director, Zoological Survey of India. As mentioned by Shri V. Anand in his foreword, this document constitutes a Macrolevel statement of strategies, gaps and further action needed for conservation and sustainable use of biodiversity in a broader perspective and identifies the basic goals and thrust areas and outlines action plans for various subjects.

Assessment of the relationship of this document to NBSAP

1. How much or which of the NBSAP scope does the document cover?

The approach statement on page 9 recognizes the need to formulate and implement a biodiversity action plan which is consistent with the ecological, social cultural and economic mosaic of the country. In terms of coverage this document is structurally different from what NBSAP envisages but in spirit is almost the same though it is not as detailed or elaborate. There is a recognition of the importance of participation from all stakeholders, including women, in the conservation and sustainable use; though for me it appears that this call is for execution of the plan and not for the preparation of the plan. There does not seem to have been any consultation with any of the stakeholder communities.

2. Is this coverage adequate in terms of the points that action plan should contain?

(a) Statement of the issue or problems

is covered in some respects but not all. For example, the ecosystem diversity does not cover cultivated ecosystems or the high altitude ecosystems. Under coastal and marine ecosystems only mangrove and coral reefs are covered. These are no doubt critical ecosystem but the components of biodiversity use comes to a large extent from the fisheries in the coastal and shelf waters. Fish yield is the major biodiversity use at the moment and this is what will shape the policies on coastal marine biodiversity rather than mangroves and coral reefs. However this document does not discuss that.

Consideration of the ecosystems is very brief and in essence restricted to geographical distribution and the areal extent, with some notes on the species composition and potential uses.

(b) Identification of the ongoing initiatives

The chapter 4 describes the current efforts, gaps and action programs. This has been arranged under 11 areas like survey, conservation, utilization, people's participation among others. Under each of this heading, the sub-headings "current status" and "gaps" do identify the ongoing initiatives or the lack of them. For example, on page 38 the document recognizes clearly that there is a glaring gap in the existing legislations relevant to biodiversity; most of these acts pertain mainly to use/exploitation, than conservation.

(c) Identification of key actors involved

This point does not seem to have been addressed to in detail except for the names of the laboratories concerned with studies on biodiversity. No other actor has been identified.

(d) Identification of major gaps coverage

	data from the COBE satellite	
1993ApJ...413...14N NASEL\'SKIJ, P.;NOVIKOV, I.	0.284 Microwave background anisotropy on scales 10 arcmin - 2 deg as an indicator of the cosmological model	8/93
1993ApJ...410L...1G GORSKI, K. M.;STOMPOR, R.; JUSZKIEWICZ, R.	0.284 Cold dark matter and degree-scale cosmic microwave background anisotropy statistics after COBE	6/93
1993ApJ...402..359A ARNAU, J. V.;FULLANA, M. J.; MONREAL, L.;SAEZ, D.	0.284 On the microwave background anisotropies produced by nonlinear voids	1/93
1992PhRvL..68..733G GORSKI, K. M.;SILK, J.; VITTORIO, N.	0.284 Cold dark matter confronts the cosmic microwave background - Large-angular-scale anisotropies in Omega sub 0 + lambda 1 models	2/92
1992ApJ...396L..57D DE BERNARDIS, P.;MASI, S.; MELCHIORRI, F.;MELCHIORRI, B.; VITTORIO, N.	0.284 Testing the isotropy of the cosmic microwave background - The ULISSE experiment	9/92
1992ApJ...385L...9V VITTORIO, N.;SILK, J.	0.284 Anisotropies of the cosmic microwave background in nonstandard cold dark matter models	1/92
1991PhDT.....7A ALSOP, D. C.	0.284 The millimeter and submillimeter wavelength diffuse backgrounds: Measurements of the spectrum and anisotropy	0/91
1991iraa...11..323M MARTINEZ-GONZALEZ, E.; SANZ, J. L.	0.284 CMB anisotropies - Observations and predictions	0/91
1991ApJ...372L...1V VITTORIO, N.;MEINHOLD, P.; LUBIN, P.;MUCIACCIA, P. F.; SILK, J.	0.284 Limits on cold dark matter cosmologies from new anisotropy bounds on the cosmic microwave background	5/91
1991ApJ...370L...5G GORSKI, K. M.	0.284 Will COBE challenge the inflationary paradigm? - Cosmic microwave background anisotropies versus large-scale streaming motions revisited	3/91
1990N91-11639.....S SUTO, Y.;GOUDA, N.; SUGIYAMA, N.	0.284 Microwave background anisotropies and the primordial spectrum of cosmological density fluctuations	3/90
1990ApJS...74..665S SUTO, Y.;GOUDA, N.; SUGIYAMA, N.	0.284 Microwave background anisotropies and the primordial spectrum of cosmological density fluctuations	11/90
1990ApJ...361L..37G GAO, Y.;STECKER, F. W.; GLEISER, M.;CLINE, D. B.	0.284 Large-scale anisotropy in the extragalactic gamma-ray background as a probe for cosmological antimatter	10/90

The themes that are taken for the assessment of current status and gaps do not match with those set out in the NBSAP. Nevertheless under each of the theme in the document the major gaps have been identified.

(e) Delineation of strategies needed to plug gaps

All the action plans listed out are probably strategies because none of them provide any clue as to go about. For example, on page 49 there is a mention "Establish Self Sustaining Monitoring System" for overseeing the activities and effectiveness of the protected area network. Apart from not defining what is the Self Sustaining Monitoring System this statement does not spell out how the proposed Monitoring System can be made to work. Another example is "Intensify Measures for restoration of degraded habitats". Neither this explains how.

Some action points could be still more vague. For example "ensure conservation of biodiversity outside the protected areas network, all private property, on common lands and water bodies". is there anything left?

(f) List of measures and actions needed

All the action points listed out are indistinguishable from strategies.

(g) Identification of key elements needed for implementation

This has been covered very briefly, in exactly 3 paragraphs over half a page. The sections 4.10 and 4.11 do provide, however, some idea on institutional structures.

(h) Specific project proposals

None

(I) Time frame for implementation

Not considered

3. Which of the thematic and sub thematic areas does the document cover?

Themes 10 and 12 are directly addressed. Other themes find marginal mention or none at all. Among the sub-state sites and interstate eco-regions only the desert ecosystem is mentioned.

4. What major gaps does the document leave in covering the themes and sub-themes?

It misses out themes 1, 2, 3, 4, 9, 11 and 13. Themes 5, 6, 7 and 8 find mention across the document and the headings like species diversity, ecosystem diversity, genetic diversity, threats to diversity, conservation and sustainable utilization. None of the sub-themes find any mention.

5. Does the document make recommendations for follow-up?

Almost all the action plans are good recommendations for follow up, though some are difficult to adopt. One example is on page 52 - "Explore possibilities of ex situ conservation in permafrost". Another bloomer is on page 58 - "Introducing crop protection measures (e.g. electric fencing)".

6. With this document in any way contradict other existing action plans?

This document is basically a scientific/ semi-scientific one.

The section 1, 2 and 3 are more like status reports and do not entrain any contradiction save for some typographical errors. Example: the forest cover of 6,33,397 sq. km on page 17 becomes 6,33,970 million hectares on page 30.

1991MNRAS.249..126B BILDHAUER, S.;FUTAMASE, T.	0.323	3/91 The cosmic microwave background in a globally inhomogeneous universe
1991MNRAS.248..705B BANDAY, A. J.; WOLFENDALE, A. W.	0.323	2/91 Fluctuations in the galactic synchrotron radiation. I - Implications for searches for fluctuations of cosmological origin
1991heaa.rept..285M MUSHOTZKY, R.	0.323	0/91 The large-scale surface brightness distribution of the x ray background
1991ApJ...375..432B BANDAY, A. J.; WOLFENDALE, A. W.;GILER, M.; SZABELSKA, B.;SZABELSKI, J.	0.323	7/91 Cosmic rays and cosmological microwave background fluctuations
1991aftm.proc..288M MORIKAWA, M.	0.323	0/91 Cosmology with oscillating Hubble parameter
1990qfcc.proc...21P PARTRIDGE, R. B.	0.323	0/90 Cosmological parameters derived from the cosmic microwave background radiation
1990Natur.345..507B BERTSCHINGER, E.; GORSKI, K. M.;DEKEL, A.	0.323	6/90 Effect of the Great Attractor on the cosmic microwave background radiation
1990N91-19992.....T TOMITA, K.	0.323	8/90 Gravitational lens effect of wall-like objects and its cosmological implications
1990gssm.rept...49D DEBERNARDIS, P.;MASI, S.; MELCHIORRI, B.;MELCHIORRI, F.	0.323	12/90 Sub-millimetric cosmology: From ground based to space observations
1990gebr.book..295P PEEBLES, P. J. E.	0.323	0/90 Cosmology and fluctuations in the radiation backgrounds
1990gebr.book..283P PARTRIDGE, R. B.	0.323	0/90 Extragalactic backgrounds - Common features and new work on intracluster light
1990cmwb.book..215H HAYAKAWA, S.	0.323	0/90 Cosmic background radiation - Components in other wavelength ranges and their relevance to microwave background
1990A90-52701.....B BLANCO, A.;STRAFELLA, F.	0.323	0/90 National Conference on Infrared Astronomy, 3rd, Gallipoli, Italy, Sept. 19-22, 1989, Proceedings
1989N91-18920.....S SILK, J. I.;DAVIS, M.	0.323	0/89 High energy physics and cosmology
1989MNRAS.237..109M MADSEN, M. S.	0.323	3/89 Magnetic fields in cosmology
1989grgp.conf..289M MATZNER, R. A.;MCCRACKEN, J.	0.323	0/89 Recent developments in cosmology
1989ApJ...346..601E ELLIS, G. F. R.;	0.323	11/89 Integral constraints on perturbations of

The action plans would require changes in the existing framework for biodiversity conservation, as the document admits that the current legislations are inadequate. But then I don't think the document was expected to go into those aspects.

7. Is there any indication of the process carried out in making this document?

The write-up on current status appears to have been drawn from published accounts. The sections on gaps and action points appear to have been the outcome of thinking by more than one but it is not clear whether this was collective and if so who were involved. In any case there does not seem to have been any review of the action points by others. Example is the action point "develop dichotomous keys for type collections" (page 41) that seems rather curious. The entire taxonomy is based on such keys.

Summary

This could be a good baseline document from which the WGs may draw some inputs. We need to get copies for all WGs.

primordial gas in the post-recombination epoch (z = 1000 or less)

1988N88-22850.....L
LUBIN, P.;VILLELA, T.;
EPSTEIN, G.;SMOOT, G.
0.327 4/88
A map of the cosmic background radiaton at 3 millimeters

1988dm...work..123R
REPHAELI, Y.;SMOOT, G.
0.327 0/88
Cosmological implications from recent spectral measurements of the microwave background radiation

1985N86-26275.....S
SMOOT, G. F.
0.327 9/85
Spectrum of the cosmic background radiation: Early and recent measurements from the White Mountain Research Station

1985ApJ...298L...1L
LUBIN, P.;VILLELA, T.;
EPSTEIN, G.;SMOOT, G.
0.327 11/85
A map of the cosmic background radiation at 3 millimeters

1993PhRvL..71.1124L
LUO, X.;SCHRAMM, D. N.
0.323 8/93
Testing for the Gaussian nature of cosmological density perturbations through the three-point temperature correlation function

1992VA.....35...11A
ALEXANDER, D.
0.323 0/92
From the Hubble expansion to higher dimensions - A review of modern cosmology

1992PhS...T43.....E
ELVIUS, A.
0.323 0/92
Extragalactic astronomy including observational cosmology; Proceedings of the Crafoord Symposium, Stockholm, Sweden, Sept. 25, 26, 1991

1992N94-13096.....T
TURNER, M. S.
0.323 0/92
Inflation after COBE: Lectures on inflationary cosmology

1992issacproc..213C
CARR, B. J.
0.323 0/92
Sources of cosmic infrared-submillimetre background radiation

1992issacproc..129S
SILK, J.
0.323 0/92
The cosmic microwave background radiation

1992ApJ...399L...1K
KASHLINSKY, A.
0.323 11/92
Latest COBE results, large-scale data, and predictions of inflation

1992ApJ...385....1S
SAHNI, V.;FELDMAN, H.;
STEBBINS, A.
0.323 1/92
Loitering universe

1992A93-51701.....S
SIGNORE, M.;DUPRAZ, C.
0.323 0/92
The infrared and submillimetre sky after COBE; Proceedings of the NATO Advanced Study Institute, Les Houches, France, Mar. 20-30, 1991

1991Natur.350..469H
HOGAN, C. J.
0.323 4/91
Formation of cosmic structure by Doppler instability

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Some meetings, one wkshp

2. Is this coverage adequate in terms of the points that action plan should contain?

(a) Statement of the issue or problems

is covered in some respects but not all. For example, the ecosystem diversity does not cover cultivated ecosystems or the high altitude ecosystems. Under coastal and marine ecosystems only mangrove and coral reefs are covered. These are no doubt critical ecosystem but the components of biodiversity use comes to a large extent from the fisheries in the coastal and shelf waters. Fish yield is the major biodiversity use at the moment and this is what will shape the policies on coastal marine biodiversity rather than mangroves and coral reefs. However this document does not discuss that.

Imp. gap

Consideration of the ecosystems is very brief and in essence restricted to geographical distribution and the areal extent, with some notes on the species composition and potential uses.

(b) Identification of the ongoing initiatives

The chapter 4 describes the current efforts, gaps and action programs. This has been arranged under 11 areas like survey, conservation, utilization, people's participation among others. Under each of this heading, the sub-headings "current status" and "gaps" do identify the ongoing initiatives or the lack of them. For example, on page 38 the document recognizes clearly that there is a glaring gap in the existing legislations relevant to biodiversity; most of these acts pertain mainly to use/exploitation, than conservation.

Need to point out to specific TWGs/SSCs..

See also AK/SS review

(c) Identification of key actors involved

This point does not seem to have been addressed to in detail except for the names of the laboratories concerned with studies on biodiversity. No other actor has been identified.

Imp. gap

(d) Identification of major gaps coverage

The themes that are taken for the assessment of current status and gaps do not match with those set out in the NBSAP. Nevertheless under each of the theme in the document the major gaps have been identified.

The crucial observation from the equation (14) is that the combination $\mathcal{C}(\mu)/\mu$ is a function of the combination $\mu\sigma^2$ only. What does it imply? The term in μ^p, the coefficient of which is the pth cumulant we are looking for, is then proportional to $\sigma^{2(p-1)}$. It rigorously demonstrates a scaling relation between the cumulants in the small σ limit (i.e. at large scales). The expression of these coefficients can be obtained with an expansion of the function $\mathcal{C}(\mu)$ with μ: $\mathcal{C}(\mu) = \mu^2\sigma^2/2 + \mu^3\sigma^4 + 3\mu^4\sigma^6 + \ldots$. Then, for the skewness and kurtosis, for instance, we get

$$S_3(0) = 6, \tag{15a}$$

and

$$S_4(0) = 72. \tag{15b}$$

These results can be extended by the further perturbative calculation that takes into account the next terms of the expansion in the steepest descent method. It is then possible to get the first σ corrections for the expression of the skewness and the kurtosis. We then get

$$S_3(\sigma) = 6 + 24\sigma^2 + O(\sigma^4), \tag{16a}$$

and

$$S_4(\sigma) = 72 + 810\sigma^2 + O(\sigma^4). \tag{16b}$$

These expansions are not affected by the shape and parameters of the cut-offs. Theoretical curves (16) derived for small σ are plotted on Fig. 2, and indeed osculate the universal numerical curves for small σ.

One of the challenges of the study of the large-scale structure formation is to find the σ dependence of the S_p parameters. From the theoretical point of view, it is not clear whether the σ dependence can be accurately determined with perturbation theory in the single stream approximation. Multistreaming may change the behavior in an unknown way. But we present here the results in 1D case to stress that perturbation theory does not prove at all that the parameters S_p are constant when $\sigma < 1$. The important property is that, for Gaussian initial fluctuations, they have finite limits at small σ. Note that the expansion of S_p as a function of σ similar to formula (16) has never been done for the 3D case.

2.4. The reconstruction method from the generating function of the cumulants

In the previous section we solved the problem how to find the moments from the known PDF. When the whole series of the cumulants is known it is possible to to construct the density PDF from the generating function of the cumulants by inversion of the relation (10) (the inverse Laplace transformation):

$$P(\varrho)\mathrm{d}\varrho = \frac{\mathrm{d}\varrho}{2\pi\mathrm{i}} \int_{-\mathrm{i}\infty}^{+\mathrm{i}\infty} \mathrm{d}\mu \exp\left[-C(\mu) - (\varrho - 1)\mu\right], \tag{17}$$

where the integration is made in the complex plane.

In practice we can find the moments and generating function in the limit of small σ. For the further analysis let us define the function $\varphi(y)$ by the relation

$$\varphi(y,\sigma) = \sum_{p=1}^{\infty} S_p(\sigma) \frac{(-1)^{p-1}}{p!} y^p = y - \sigma^2 \mathcal{C}(-y/\sigma^2), \tag{18}$$

where we define $S_1 = 1$, $S_2 = 1$. The advantage of this new function is that it is finite for an arbitrary y in the limit of small σ. This function is the generating function of the parameters $S_p(\sigma)$. Then from (17) and (18) the density PDF is given by

$$P(\varrho)\mathrm{d}\varrho = \frac{\mathrm{d}\varrho}{2\pi\mathrm{i}\sigma^2} \int_{-\mathrm{i}\infty}^{+\mathrm{i}\infty} \mathrm{d}y \exp\left[-\frac{\varphi(y,\sigma)}{\sigma^2} + \frac{\varrho y}{\sigma^2}\right], \tag{19}$$

(e) Delineation of strategies needed to plug gaps

All the action plans listed out are probably strategies because none of them provide any clue as to go about. For example, on page 49 there is a mention "Establish Self Sustaining Monitoring System" for overseeing the activities and effectiveness of the protected area network. Apart from not defining what is the Self Sustaining Monitoring System this statement does not spell out how the proposed Monitoring System can be made to work. Another example is "Intensify Measures for restoration of degraded habitats". Neither this explains how.

Separate for each TWG

Some action points could be still more vague. For example "ensure conservation of biodiversity outside the protected areas network, all private property, on common lands and water bodies". is there anything left?

(f) List of measures and actions needed

All the action points listed out are indistinguishable from strategies.

(g) Identification of key elements needed for implementation

This has been covered very briefly, in exactly 3 paragraphs over half a page. The sections 4.10 and 4.11 do provide, however, some idea on institutional structures.

For policies the WG ?

(h) Specific project proposals

None

(I) Time frame for implementation

Not considered

3. Which of the thematic and sub thematic areas does the document cover?

Themes 10 and 12 are directly addressed. Other themes find marginal mention or none at all. Among the sub-state sites and interstate eco-regions only the desert ecosystem is mentioned.

4. What major gaps does the document leave in covering the themes and sub-themes?

It misses out themes 1, 2, 3, 4, 9, 11 and 13. Themes 5, 6, 7 and 8 find mention across the document and the headings like species diversity, ecosystem diversity, genetic diversity, threats to diversity, conservation and sustainable utilization. None of the sub-themes find any mention.

jmp.

5. Does the document make recommendations for follow-up?

Almost all the action plans are good recommendations for follow up, though some are difficult to adopt. One example is on page 52 - "Explore possibilities of ex situ conservation in permafrost". Another bloomer is on page 58 - "Introducing crop protection measures (e.g. electric fencing)".

? (liquid nitrogen?)

6. With this document in any way contradict other existing action plans?

This document is basically a scientific/ semi-scientific one.

The section 1, 2 and 3 are more like status reports and do not entrain any contradiction save for some typographical errors. Example: the forest cover of 6,33,397 sq. km on page 17 becomes 6,33,970 million hectares on page 30.

2.2. Density PDF and moments

As recalled in the introduction, the knowledge of the shape of the PDF and the moments are intimately related. The very example we are presenting now is here to point out that this is not completely true. Indeed, none of the moments of the previous distribution are finite, because of the ϱ^{-3}-asymptota! It can be easily checked that even for an arbitrary small σ the density PDF behaves like $\sqrt{2/\pi}/\sigma \exp(-1/2\sigma^2)\varrho^{-3}$ at high density. However, physical density in caustics is finite. We expect that a physical process will operate as sort of regularization of the high density tail of $P(\varrho)$. For example, Zel'dovich & Shandarin (1982) showed how physical properties of the hot dark matter lead to the finite density in the caustics. Obviously we do not know what will be the exact form of this regularization in general case, so we simply describe the regularization process by a cut-off at large density (where the physical regularizing processes are thought to occur) that makes the moments finite. The shape of this cut-off is somewhat arbitrary, but we will see that, to some extent, a fair fraction of the properties of the moments do not depend on the procedure that has been adopted. We chose two toy models of distribution, with the sharp cutoff and with the exponential cutoff, in the following form:

$$\begin{aligned} P_{\rm regl}(\varrho)\ \mathrm{d}\varrho &= \frac{1}{C_1} P_{1D}(\varrho)\ \mathrm{d}\varrho \quad \text{if} \quad \varrho < \varrho_c, \\ P_{\rm regl}(\varrho)\ \mathrm{d}\varrho &= 0 \quad \text{if} \quad \varrho > \varrho_c, \end{aligned} \tag{5}$$

and

$$P_{\rm reg2}(\varrho)\ \mathrm{d}\varrho = \frac{1}{C_2}\ P_{1D}(\varrho) \left[1 + \frac{\exp(x)}{\exp(x)+\exp(-x)} \left(\exp(-\varrho/\varrho_c) - 1\right)\right]\ \mathrm{d}\varrho, \tag{6}$$
$$x = \varrho - \varrho_c.$$

The coefficients C_1 and C_2 are simply normalization factors. The adopted values of ϱ_c will be quite large (above 5) insuring that the shape of the density PDF is not changed in the domain of interest that is for $0 < \varrho <$ several. The coefficients C_1 and C_2 are very close to unity in these cases. In Fig. 1 we present the distribution (4) and regularized distributions (6).

Once such a regularization is made, the moments of the distribution functions $\langle \delta^p \rangle = \int_0^\infty \mathrm{d}\varrho\, P(\varrho)(\varrho-1)^p$ can be easily calculated numerically. We present the results in terms of S_p parameters adopted in the literature. These parameters are defined through the cumulants (see Appendix A, Eq. [A2]):

$$S_p = \langle \delta^p \rangle_c / \sigma^{2(p-1)}. \tag{7}$$

This is a generic definition which is not based on any a priori assumption. The S_p parameters would be constants in the hierarchical ansatz, but in general they can be seen as functions of σ.

The parameter S_3 multiplied by σ is the skewness, and S_4 multiplied by σ^2 is the kurtosis. The numerical calculations of the parameters S_3 and S_4 for the regularized distributions (5) and (6) for the exact Zel'dovich solution is shown in Fig. 2. The measurements have been made by calculating the actual second, third, and fourth moment of the regularized density PDF, and by taking the appropriate ratios. We see that these coefficients are finite. The shapes of $S_3(\sigma)$ and $S_4(\sigma)$ are universal in the interval of σ from 0 up to the value ~ 0.2. These shapes are independent of the form of the cutoff, as well as on the parameter of truncation. In the limit of $\sigma \to 0$ we found $S_3 \approx 6$, and $S_4 \approx 72$. In the next section we will confirm these figures and their universality by analytical calculations. We conclude that the found values of $S_3(\sigma)$ and $S_4(\sigma)$ for $\sigma \lesssim 0.2$ are the proper moments in the 1D case. There is also some universality of these coefficients for $\sigma \gtrsim 1.2$, in the sense that it does not depend on the parameter ϱ_c for each panel. However, it does depend on the form of regularization. We suggest that the found values of $S_3(\sigma)$ and $S_4(\sigma)$ for $\sigma \gtrsim 1.2$ do not reflect the proper moments, but rather the shape of the adopted cutoff and thus do not have any physical meaning.

2.3. Calculation of S_p for small σ

It is possible to calculate the S_p series analytically when the variance σ of the distribution function is small. This calculation requires the introduction of the generating functions of moments and cumulants (see

The action plans would require changes in the existing framework for biodiversity conservation, as the document admits that the current legislations are inadequate. But then I don't think the document was expected to go into those aspects.

7. Is there any indication of the process carried out in making this document?

The write-up on current status appears to have been drawn from published accounts. The sections on gaps and action points appear to have been the outcome of thinking by more than one but it is not clear whether this was collective and if so who were involved. In any case there does not seem to have been any review of the action points by others. Example is the action point "develop dichotomous keys for type collections" (page 41) that seems rather curious. The entire taxonomy is based on such keys.

look at Anu/B's report

Summary

This could be a good baseline document from which the WGs may draw some inputs. We need to get copies for all WGs.

And SSCs? Distr. at INW—

table.

2. AN ILLUSTRATIVE EXAMPLE: THE 1D DYNAMICS

In this part we aim to present the analytical tools developed in the mildly nonlinear regime in case of a simpler dynamics. We assume in this part that the fluctuations are only one-dimensional. The general methods suggested here will be used in the next sections in the 3D case.

2.1. The construction of the density PDF from the Zel'dovich approximation

It is convenient to use the equation of motion in the Lagrangian description. In such a case the dynamics is described by the displacement, $\mathbf{S}(\mathbf{q},t)$, of each particle from its initial position $\mathbf{q}$. Its current Eulerian comoving position, $\mathbf{x}$, is then given by

$$\mathbf{x} = \mathbf{q} + \mathbf{S}(\mathbf{q},t). \tag{1}$$

For 1D case the mildly non-linear dynamics is quite simple. The reason is that the force exerted by a density perturbation over a given particle is independent of its distance to the particle. Therefore, before any shell crossing, the displacement of each particle depends on its Lagrangian position $\mathbf{q}$ only. Then the displacement field for the growing mode can be factorized

$$\mathbf{S}(\mathbf{q},t) = \Psi(\mathbf{q})\ D(t). \tag{2}$$

The 3D generalization of this form of the displacement is the Zel'dovich approximation (ZA). In 1D case the ZA is then identical to the exact dynamics. In relation (2) the displacement factorizes in a spatial function, $\Psi(\mathbf{q})$, which depends on the initial conditions, and a universal time dependent function $D(t)$ which contains by definition the time dependence of the growing modes. Let us call λ_0 the derivative of $-\Psi(\mathbf{q})$ with respect to $\mathbf{q}$. The local comoving density (in units of the mean density, $\varrho = \rho/\bar{\rho}$) is then, by the mass conservation equation, given by

$$\varrho(\mathbf{q}) = \frac{1}{|1 - D\lambda_0|}. \tag{3}$$

The reconstruction of the density PDF then is based on the statistical properties of λ_0. For Gaussian initial conditions, λ_0 simply obeys Gaussian statistics. The derivation of the shape of the density PDF is then just a matter of change of variable, and as it can be seen in (3) the density contrast will not be normally distributed. This is general feature due to the nature of this quantity. The positive density contrast can reach any large value while the negative density contrast is restricted by $\varrho \geq 0$. Hence the probability function $P(\varrho, D(t))$, meaning the fraction of volume with a given value of density, is expected to be very non-Gaussian even in the quasilinear stage. However, note that a simple change of variable leads to the density PDF at a given point, in Lagrangian space. The distribution in Eulerian space should take into account the fact that a given amount of matter in a dense spot occupies a small volume. The density PDF in Eulerian space is then obtained by divided the density distribution in Lagrangian space by the density, and multiplied by the numerical factor which controls the normalization. This factor is related to the number of streams $\langle N_s \rangle$, in cases $\sigma \lesssim 1$ under consideration it is very close to unity, and we ignore it (e.g. Gurbatov et al. 1991).

Then the density PDF in 1D reads

$$\begin{aligned} P_{1D}(\varrho)\mathrm{d}\varrho &= \frac{1}{(2\pi\sigma^2)^{1/2}} \left[\exp(-\frac{\lambda^2}{2\sigma^2}) + \exp(-\frac{\lambda'^2}{2\sigma^2})\right] \frac{\mathrm{d}\varrho}{\varrho^3}, \\ \lambda \equiv D\,\lambda_0 &= 1 - \frac{1}{\varrho}, \quad \lambda' \equiv D\,\lambda_0' = 1 + \frac{1}{\varrho}. \end{aligned} \tag{4}$$

Note that $\sigma = \sigma_0\, D(t)$, where σ_0 is the variance of the initial linear density contrast. In the limit of small σ the distribution (4) transits to the Gaussian form. The high density asymptota ϱ^{-3} that is seen in equation (4) is induced by the caustics.

TWG General 5.19.1 / Them Doc / Review of National Policy & Macrolevel Strategy on Bio. / Ver 1. SB / 27.4.2000

Document to be reviewed: National Policy and Macrolevel Strategy on Biodiversity
Reviewed by: Seema Bhatt
Date: April 27,2000

This is perhaps the most important document that should be kept in mind while developing the NBSAP. The MoEF hopes that the NBSAP will use this strategy as a base to develop microlevel strategies for different States and for the country as a whole.

The document itself is divided into four parts. Part I is an introduction to the need for biodiversity conservation. Part II focuses on the Biodiversity Conservation National Policy and Goals. Part III is a brief introduction to India's biodiversity and threats to the same. Part IV focuses on the current status, gaps and action points in areas of biodiversity.

Relevance to the NBSAP

-Since the MoEF expects the NBSAP to follow from this document, Part II of this document i.e. the national policy and goals for biodiversity conservation in India must be kept in mind by the TPCG, TWs and State nodal agencies.

-Part IV of this document is also relevant for NBSAP since it points out the gaps and suggests some action points for implementation in areas of biodiversity. The gaps would be more important to keep in mind since most of the action points are more implementable by the MoEF and other government departments.

Specify those relevant for each TW

√ Useful

Part IV is divided into eleven different areas. I list these here with an indication of which one of the NBSAP thematic working groups would cover these:

4.1 Legal and Policy Framework (TW 11)
4.2 Survey of Biodiversity and National Database (TWs 5,6,7,8,9,10)
4.3 *In situ* Conservation (TWs 6,7,8,9,10)
4.4 *Ex situ* Conservation (TWs 6,7,8,9,10)
4.5 Sustainable Utilisation (TW 2)
4.6 Indigenous Knowledge Systems, Innovations and Practices, and Benefit Sharing (TWs 2,12)
4.7 People's Participation (Cross-cutting theme)
4.8 Institutional framework and Capacity Building (TWs 11,13)
4.9 Education, Training and Extension (TW 13)
4.10 Research and Development Activities (TW 13)
4.11 International Cooperation (Cross-cutting theme)

Interestingly, there four themes under NBSAP that have not been overtly covered by the Macrolevel strategy. These are: 1,3,4 and 14.

!! Imp.

Recommendations

- The coordinators for each TW, authors of thematic papers and the State nodal agencies need to be all given a copy each of this strategy.

!!

• Ask for 100 copies of this doc. & of Country Report

Technology

Safe from the Y2K Bug?

Less reliant on computers than most countries, China is confident it can fight the millennium bug, reports **Antoaneta Bezlova** of Inter Press Service.

BEIJING (IPS) - Ask a man on the street in Beijing about the Y2K bug, and you are likely to receive a reply that mixes confidence and unconcern.

"Our life doesn't hinge on the computer," says Chen Heguang, a driving instructor, somewhat proudly. "Unlike Americans, we don't have to worry about disasters on the New Year."

While foreign computer and software companies are panting at the potential of China's computer market, the average Chinese person still seems tuned to a life undisturbed by computer glitches. Fighting the Y2K or the 'millennium bug', has been a marginal story in the newspapers and on the TV, leaving the few in charge of the battle to worry whether the bug will find China unprepared.

Experts fear that the computer systems in financial institutions, nuclear power plants, the communication industry and the military might all crash on January 1 next year. Older computer systems that read years by the last two digits will be unable to record the correct date next year and may malfunction.

Last year prominent software designer Ni Guangnan penned an article in the official *People's Daily*, calling for a 'wartime-style mobilisation effort' to beat the bug.

But Zhao Bo, chief of the software division of the Ministry of Information Industry, which spearheads the battle, seems more composed. "The threat of the bug is less than in developed countries because China is less reliant on computers," he says. "But for banks and other financial companies, it is a problem just as in other countries."

The government has been trying to force industries into fixing their computer systems, but a lack of know-how, reliance on a hodgepodge of software and paltry financial support for the campaign have raised concerns whether China will be anywhere near ready.

The Ministry of Information Industry had ordered all sectors which it thought might be unable to become Y2K-ready to submit a list of emergency measures by the end of September.

Conservative contingency planning shows up also in the decision of the People's Bank of China to move its year-end settlements up a day to December 30, and in the announcement that from Dec 21 to Jan 1, airplanes in China will take off 15 minutes apart instead of the usual 10.

Yet, overall, critical national sectors like banking and aviation, are considered pretty safe. Experts do not expect to see in the banking sector here what some countries fear most — a run on the banks that may cause the government to freeze assets.

- Guidelines issued for each of these groups must clearly mention that relevant portions of the macrolevel strategy must be kept in mind while preparing their plans/ strategies/reports.

-The Tables and Boxes in this document may serve as useful tools at various levels of NBSAP related work.

Pl. list according to TWG or SSC

Some leading state banks have already spent 800 million yuan ($96 billion) on dealing with the Y2K bug and would have spent one billion by the end of the year.

In a dramatic example of the efforts made by the aviation sector to combat the bug, China has ordered the chiefs of all mainland airlines to be in the air on January 1 to win public confidence.

What constitutes a real problem though, are those medium to small-sized, cash-strapped state enterprises that make up half the economy. Most of them have been slow to prepare, or have not paid enough attention to the problem.

While the Ministry of Information Industry conducted verification of compliance in the key sectors such as banking and energy, individual enterprises were responsible for their own remediation efforts.

According to a report by the US embassy in Beijing, foreign vendors have expressed concern that state enterprises will not prepare themselves for the Y2K bug, and then will blame foreigners for the result. Some of them have already gathered anecdotal evidence that Y2K problems will occur.

When the chocolate giant Cadbury Food Ltd. presented a declaration of Y2K compliance to the Beijing electric authority in an effort to guarantee power at the millennium, the reply they got was that since the electricity was state-owned, no one could take responsibility to sign the declaration.

Those enterprises that have begun tackling the problem face an uphill battle because of the rampant use of pirated software.

The Business Software Alliance claims that some 98 percent of the software used in China is pirated, including most of the software used in government offices and state-owned enterprises.

Zhao Bo says that it is more difficult to deal with the Y2K bug in pirated software because the user cannot go back to the original supplier to correct it.

If airlines, the railways, the banks or other public companies use pirated software that has not been corrected, it could lead to chaos on their networks, experts here say.

The sheer size of the existing computer market in China thrills businessmen, but has created many difficulties for the Y2K taskforce under the Ministry of Information Industry.

According to the China Computer Industry Association, there are over 10 million computers installed in China and the number is rising by 50 percent each year.

To avoid the worst case scenario, in mid-December the central government will announce contingency measures to be on the safe side. People will be told that banks may close for a few days over the New Year's, and train and domestic plane routes may be reduced. (Copyright©Inter Press Service)

TWG General 5-29 Them DOC \ Review of National Policy & Macro level Strategy on Bio \ ver. 1. Janardhan Rao

(AICFAIP note)

POINTS FOR DISCUSSION ON THE BIO-DIVERSITY POLICY

The Report of the National Policy and Micro Level Strategy on Biodiversity is a well worked out document on many accounts. The coverage, focus, concern and the problem framework of the report is in many ways remain comprehensive and carefully visualised. However, few pertinent issues are to be discussed for its further appropriateness and necessary incorporations.

1. The nature of the argument followed in the report predominantly remain a resource centric rather than people centric. The terminology of the resource use is very much necessary but in the whole effort, a reader gets a feeling that the report is focusing on the forest or plant, animal wealth as resource conservation is imminent. But the people who are the conserverswhether rural or tribal people did not get enough mention in the report. For instance, to quote "Biodiversity refers to variety of life forms ..... mammals, birds, reptiles, amphibians, fish, insects and other invertebrates. ------- eco-system diversity. The focus on the nature in wider context is understandable. How is that the beneficiary of it i.e. man does not get included in the discourse. The divide of the man and the ecosystem is to be abadoned and they should be seen in integrative fashion. (Page 2- paragraph 3). Appreciably, the reports presents the multi-dimensional value of the biodiversity. (Page 3.5). It should have been very relevant to deal with the aspects of the threats to the sustainability of the bio-diversity, such as:

a) Poaching gangs and their operations throughout the country

1 b) Indiscriminate onslaught on the industry related to forest wealth.

c) Rapid commercialisation of the National Resource without substantial use either national exchequer of the government -- the stakeholders.

d) Extensive use of soil wealth and the deepening crisis in the country side is due to the excessively used pesticides and its effect over the regeneration potential of the variety of insects etc.

Further, the food security status of the tribals has been rightly admitted in the reports. (P 4-9) but now what mechanisms with which these linkages could be strengthened has not been exactly focused.

Chapter 2 In this chapter Bio-diversity policy and goals are discussed. But few more things are to be seriously thought of. They are mainly referring to action strategy on bio-diversity consisting of 27 points. Among these points, dimension of "private user accountability" is to be emphasised. Otherwise, the large private industries are coming up in the name of corporations was only use and forget about its responsibility of reservation. A non-bureaucratic mechanism towards the dimension has to be evolved.

1 Further, increasing trends of corporation of agricultural and forest land by the State and Central Governments do demand a clear cut policy stand. On this point, the reports does

not clearly speak. Further, the mention about the legislative and policy frame work (PP 36-38) is an extremely useful. But this also needs to specify and link with the performance of the state governments where a number of violations are taking place. What kind of local provincial monitoring systems to be suggested for what is the role assigned for customary guardiance like Adivasis - both legal and legitimate, shall have to be dealt elaborately in the policy.

On the issue of sustainable use of biological diversity (PP 53-60 few pertinent issues need to be focussed.)

(I) Despite the rightly recognising the inter-dependence of the local communities on biological resources and the local demands of the people, the report still need to focus sharply on the mechanism with which the people are encouraged to take participation in the benefit sharing and yielding from the Biodiversity resource (P.54)

(2) Report mentions about the inter-sectoral coordination and the departments/ Ministries involved in the Bio-diversity protection. The principal destroyer of the bio-diversity wealth in India is mining Ministry of Department. No reference is made to this Ministry. With the advent of aggressive entry of global capital, mining in scheduled areas where the millions of adivasis live are coming under attack of the new situation. How do we reconcile these conflicting interests? In A.P., in one single instance of Bauxite mining, the most guarded mountain of Cintapelly where the bio-diversity is visible is -- set for a lease to a Dubai-based company. The A.P. State govt. Is planning to allocate 10,000 acres of land for its use. How do we arrest such range scale promotion of plundering process?

Further one the participation of the local people, an instance of Kani tribe in Kerala is rightly mentioned. But again the facilitating agency mentioned as model was from Kerala State. From this example the royalty to the local tribes is only 2% of the whole sum accrued. Their pattern was to be drastically modified to the advantage of the people who are the real protectors of the biodiversity.

Finally the report was to look into the crucial contribution of the various peoples movements occurring all over the country and acting as the peoples agencies in promotion of the interests of the bio-diversity. Policy effort could integrate these forces for the collective purpose of the bio-diversity protection and safeguarding the interests of the forest dependent communities in an unconventional fashion such as treating the local people as the rightful owners rather than 'mere partners.'

A legal mechanism that envisage the people as the sole protectors should be of the source of decision making on the use of the wealth of Bio-diversity.

Dr. B. Janardhan Rao

Attach to TWG General 5.22.1

ashish kothari

From: P.C.Bhattacharjee <pcbhatta@gw1.vsnl.net.in>
To: ashish kothari <ashish@nda.vsnl.net.in>; BCIL <bcil@nda.vsnl.net.in>; Sujatha NBSAP <kalpavriksh@vsnl.net>; seema.1@nda.vsnl.net.in
Subject: review document-PCB
Date: Tuesday, December 26, 2000 10:17 PM

Dear Asish/Vibha
I have give the materials forcross refering the National document. I couldnot send them to all, please do the needful from your end.As this document is a "policy document" only refering by the TWG will be of help. Some of the points which were mentioned are no more applicable, as it was published in the year 1992. Please give your comment.
PCB

NBSAP- Review documents

Cross referencing the document to TWG

NATIONAL CONSERVATION STRATEGY AND POLICY STATEMENT ON ENVIRONMENT AND DEVELOPMENT.

(Govt. of India, Ministry of Environment and Forest, June 1992)

There are altogether 9 sections with a number of subsections in each.
Section 2.0 deals with the problems: nature and dimensions.
Section 3.0 is Action Taken: (number of subsections are related to different TWG- given below)

- **3.1 Legal : List of the acts relevent to pollution and wildlife is given**

(TWG :Policy Laws, Institution planning).

- **3.4 Conservation of Forest and wildlife**

adoption of a new Forest Policy (1988) with the principal aim of ensuring ecological balance through the conservation of biological diversity, soil and water management, increase of tree cover, *meeting the requirment of the rural and tribal population,* increase in the productivity, efficient utalisation of the forest produce, substitution of wood and *people’s involvement for achiving these objectives.*

- **(-TWG: Access, benefit sharing ; TWG: Livelihood lifestyle ; TWG: Wild Plant and Animal biodiversity).**
- **Under Forest (conservation) Act,1980 stringent provision for preventing diversion of forest land for any other purpose.**
- **(TWG: Policy, laws etc ;TWG: Livelihood, life style ; Cross cutting theme: Corporate sector & biodiversity)**
- **Formulation of the National Wildlife Action Plan**
- **(TWG : Wild Plants and Animals)**
- **An exercise for preparation of the preparion of the National Forestry Action programme**
- **(TWG: Access, benefit sharing, TWG:Wild plants and animals;TWG:Livelihood, life style).**
- **Establishmwent of National parks ansd sanctuaries covering about 4% of the countries area. Ecodevelopment plans for sanctuaries and National parks. Identify the biogeographoic zones in the country for establishing a network of protected areas including seven Biosphere reserves setup so far.**
- **(TWG: Wild plants, animals TWG :Access benefit sharing TWG: Livelihood,lifestyle)**

- **Management plan for identified wetlands, mangrove areas and coral reefs.**

Approved

Architectural

(accept those ticked ✓ only)

BaKaPaSa / PROVERBS :-

✓ 1. To err is human; to admit it — superhuman!

✗ 2. A friend in need is no friend of mine.

✓ 3. Where there is a 'will' there is a bank balance.

✓ 4. Necessity is the mother of taking chances.

✓ 5. Early to ~~bed~~ college & early to ~~rise~~ class
& you never meet the ~~rich~~ wise & the Famous.

✓ 6. People living in glass houses use neighbours' toilets.

✓ 7. Birds of a feather flock to a newly washed car.

✓ 8. If at First you don't succeed, try again, try again, then give up.
There's no use being a damn fool about it!

Corrected

T. Y. B. ARCH.

Formulation of river action plan.

- (TWG:Natural aquatic eosystems ; TWG : Livelihood lifestyle ;Cross cutting theme : Intrnational issues).
- Land and Soil

-assistance to states to control shifting cultivation.
-assistance for reclamation andf development of ravine areas
-Drought prone areas programme
-Desert development programme
(TWG: Access benefit sharing TWG: Domesticated biodiversity, TWG: Natural terriestrial ecosystems; TWG: Technology industry etc).

- : Environment Impact Assesment:

Prior clearance of projects requiring diversion of forests for non- forest purposes under the forest(conservation) act, 1980.
(TWG: Technology. Industry; TWG: Access benefit sharing)
3.7. Other activities:
National environmental awereness campaign for creating environmental awereness through NGO. Surveys and research studies. Training programmes, workshops and seminars for buildingup professional competence and for creation of awereness.
(TWG:Education research training).
4.3.Agenda for action:

- to ensure sustainable and equatable use of resources for meeting the basic needis of the present and future generations without causing damage to the environment.
- To prevent and control future detoriation in land, water and air which constitute our life support systems.
- Ensure development projects are correctly sited so as to minimisetheir adverse environtal consequences.
- To ensure that the environment and the productivity of coastal areas and the marine ecosystems are protected.
- To conserve and nurture the biological diversity, genepool and other resources through environmentally sustainable development and management of ecosystems with special emphasis on our montane, marine and costal, desert,wetlands, riverine and island ecosystems.
- (TWG: Technology ,Industry TWG:livelihood lifestyle; TWG:Wild plants and animals; TWG: Natural terristrial ecosystems TWG: Natural aquatic ecosystems).
  - Biodiversity:
- Intensification of surveys and inventorisation of biological resourses in differeent parts of the country including island ecosystems.The survey should include on distribution pattern of particular species/piopulation/communities and the status of ethnobiologically importent groups.
- (TWG: Education , research)
- Full and correct rehabilitation of rural poor/tribals displaced due to the creation of national parks/bisphere reserves/tiger reserve
- (TWG: access benefit sharing ;TWG: Livelihood issues TWG:Technology,industry).
- Conservation micro –fauna and micro-flora which help in reclamation of wastelands and revival of biological potential and the land.
- (TWG: Micro-organism)

Protection and sustainable use of plant and animal genetic resources through appropriate laws and practices.

COLLEGE OF ARCH. PUNE
SIGN.
DATE
31/3/08
PROFESSIONAL WORKS

PEEYUSH SEKHSARIA

51033

Protection of domesticated species/varieties of plants and animals in order to conserve indegenous geneti diversity.
(TWG: Policy, law etc.; TWG:Domesticated biodiversity)
maintenance or corridors between national parks, sanctuaries, forests and other protec areas.
(TWG: Wild plants and animals TWG: Natural terristrial ecosystems;TWG:Access and b sharing).
-Emulation and support for protecting traditional skills and knowledge for conservation
(TWG: Culture and biodiversity; TWG: wild plants and animals TWG:Policy , laws,institu

- Develop methodologies to multiply, breed and conserve the threatened and endar species through modern techniques of tissue culture and biotecnology.

(TWG:Wild plants and animals; TWG: education, research etc).
-restriction on introduction of exotic species of animals without adequate investigation
(TWG: Wild plants and animals ;TWG: Policy, laws etc;TWG:Technology and industry).

- Biomass

For the vast mjority of our rural people, the formost need is for fuelwood,timber, fodder etc. The issue of sustainable resource utalisation, therefore has to be specially address firest from the point of biomass requirement of the rural people.
(TWG: livelihood, lifestyle etc).

- Agriculture:

-development of pesticides and insecticides policy for ther country.
-development of integrated pest management and the nutiet suply systems
-development and promotion methods of sustainable farming, specially organic and natural farming
-promotion of environmentally competable cropping practices, biofertilisers and biopesticide
-restrition on diversion of prome agricultural land for other purposes
-evolving cost effective and eficient methods of water conservation and use
(there are few more points related to these)
(TWG: Domesticated biodiversity; TWG: Policy, laws etc).
6.3: Forestry
-meeting the rights and concessions for requirements of fuelwood,fooder, min forest produce and small timber of the rural and tribal population with due cognisance of the carrying capacity of forests.
(there are a number of points related the these)
(TWG: Livelihood ,lifestyel; TWG:Wild plants and animals ;TWG:Access and benefit sharing

-supply of forest produce to the industrial consumers only at its true market value and not a concesional prices
(TWG: Technology, industry ; TWG:wild plants and animals)
-creation of land banks for compensotory afforestation
(TWG: Livelihood,lifestyle , access and benefit sharing).
P.C.Bhattacharjee

Pipal Tree

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Phone/Fax : 91-80-551 1756. email : pipaltree@vsnl.com.

11th November, 2000

Pankaj Sekhsaria
Kalpavriksh
Apt 5, Shree Dutta Krupa
908, Deccan Gymkhana
Pune – 411 004

THE TRANSFORMING WORD WORKSHOP
December 7-10th, 2000, Bangalore

Dear Pankaj Sekhsaria,

We take great pleasure in inviting you to this workshop to be held in Bangalore from the 7-10th December 2000. This is a meeting of journalists and writers from all over the globe called "The Transforming Word" an alternative media network of the Alliance for a Responsible, Plural and United World, a global civil society movement that looks at issues, challenges, hopes of this century.

We are meeting to explore ways in which we can network together and create such an alternative media network. We feel that if there are enough interventions made in the media (both mainstream and alternative) we could make a considerable difference in bringing about social change.

Now that The Transforming Word has completed a year we thought it would be nice – not to say helpful – to have all the correspondents come together for a four day workshop in Bangalore from the 7-10th of December, 2000.

The TW programme will pay for your travel to Bangalore and return as well as take care of all your boarding and lodging.

The deliberations of the workshop will help to assess the significance and impact of the programme and offer correctives where needed. Thus far, we the correspondents of The Transforming Word, have been in touch only on e-mail and it has now become imperative that we meet to evaluate the

ashish kothari

From: Dr. Rathin Barman <rathinbarman@satyam.net.in>
To: :
Cc: swansong@giasdl01.vsnl.net.in; bms_r@yahoo.com; biotech@giasdl01.vsnl.net.in; darshan@frlht.ernet.in; admin@del3.vsnl.net.in; wafar@darya.nio.org; msarin@ch1.dot.net.in; kkhlgu@gw1.vsnl.net.in; ddshyd@hd1.vsnl.net.in; pradeep.monga@undp.org; ravic@wii.gov.in; seema1@giasdl01.vsnl.net.in; irwin@pn3.vsnl.net.in; hrutidevi@hotmail.com; virindersharma@hotmail.com
Subject: From P.C. Bhattacharjee: NBSAP document
Date: Saturday, April 29, 2000 10:01 AM

Dear all
Please find herewith NBSAP Review Document
P.C. Bhattacharjee
Guwahati, Assam

NBSAP Review Document
National Conservation Strategy and Policy Statement on Environment and development.
Govt. of India, Ministry of Environment and Forest , June 1992
(An assessment with respect to the utility of the document for NBSAP)

Introduction :
A policy statement document " National conservation strategy and policy statement on environment and development" (NCSPSED) was released on June 1992, by the Ministry of Environment and Forest, recognizing the urgency , imperativeness and over-parvading nature of the environmental aspect and adverse economic implications inbuilt in the implementations stages of the developmental projects in the country. The document is also a form of recognizing the mutilation of the environment done in India, during the successive 5 year plans periods and the desperate situation of the cumulative adverse affects on all facets.

The 36 page document has 9 major sections, (1) Preamble (2) environmental problems: nature and dimensions (3) Action taken (4)constrains and agenda for action (5) Priorities and strategies for action (6) developmental policies from environmental perspectives (7) International cooperation (8) support policies and systems and (9) conclusion. There are a number of sub-sections related to NBSAP, where as some are partially associated and akin to theme and sub-theme .The document which is a policy statement only but will help in acquiring support to the process outline and identifications of theme and sub-themes of the NBSAP

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Agricultural ecosystems: the biodiversity component was not referred at all. Only environment related issues were referred. But the document also

conventional matter, the other is antimatter. Relativity forces the existence of antimatter. With the inclusion of antimatter, an electrical mirror no longer gives a deformed image.
Paul Dirac, the father of antimatter theory, had a miserable childhood, with a tyrannical father who did not allow his children to speak. Psychologically tortured, Dirac's elder brother committed suicide. Drilled into silence from childhood, Dirac's lack of communication became legendary. He would delay replying to any question until he was absolutely sure his answer was correct. Since he dealt with the most difficult questions of all, the silences could be long.

The first antiparticles
Looking at the tracks of cosmic rays, particles from outer space, in 1932 Carl Anderson finds strange tracks which curve in the wrong direction. Unaware of Dirac's prediction, he tries hard to find a way of explaining the effect. In the end he hesitatingly claims to have discovered a new particle, which behaves exactly like an electron, but the 'wrong way round'. The explanation in terms of antiparticles.
Hero, Carl Anderson, who as a 22-year-old student discovers something his Nobel prize-winning research supervisor refuses to believe. While Anderson tries to push his own discovery, the famous Cavendish Laboratory at Cambridge under Lord Rutherford enters the race. Anderson wins, but only just, and goes on to receive the Nobel Prize in 1936, age 31.

The antinucleus
If the electron has an antiparticle, then so should all the other particles. The search for them is interrupted by the Second World War, when physicists are set another problem - making the Atomic Bomb. With the war over, physicists became national heroes and were given blank cheques to build anything they wanted. Big new atom-smashing machines guarantee the next big antiparticle find, the antiproton, discovered in 1955.

Particles going backwards in time
In the immediate postwar period, the genius of Richard Feynman and other brilliant theorists produced a new mathematical picture which showed the full symmetry between particles and antiparticles. Time takes on a new significance. An antiparticle is a particle moving backwards in time! When a particle moving forwards in time meets its counterpart coming the other way, they are doomed to annihilate.
Antihero, Richard Feynman. The price of genius. Feynman was one of the brightest human beings that ever lived, but he knew it.

suggested the establishment of the PAs in 4% of the area of the country.

. It is extremely supportive in terms of guideline, environmental stategy, legal aspect. Equity and ethical issue related words are scattered in a number of sub-head.

2. Is this coverage adequate in terms of the points that an action plan should contain (see section 2 of the process outline) ?

There are partial coverage of the action plan with regard to :on going initiatives (list of all institutions, legal supports , upto 1990), strengthening of the existing institutions, reallocation of fund are some of the suggestive measures.
This has partially covered SAP , as it is a strategy and policy statement.

3. Which of the thematic and sub-thematic areas does the document cover (see Appendices 3 and 4 of the process outline)?

Out of the 14 major themes, till now identified, it has covered partially-particularly with regard to the guidelines to : (1) livelihoods, lifestyle, and biodiversity,(2)Health and biodiversity (3) wild animal biodiversity (4) wild plant biodiversity (5) natural terrestrial ecosystems (6) natural aquatic ecosystems (7)Policies, laws and institutions (8) Education, training, awareness and research and (9) International issues (as International cooperation).

It will be of help to get the guidelines for a number of sub-themes :1. Mining and biodiversity,2. Sustainable technologies 3. Biodiversity in EIA procedures 4.Thermal power and biodiversity 5. Tourism and biodiversity 6. exotic and biodiversity 7. Local health tradition 8. water management and biodiversity.

4. What major gaps does the document leave in covering these themes and sub- themes?

The document (a stategy and policy statement on environment) has not covered majority of the themes and sub-themes identified . There are some passing references of important themes, related to peoples involvement and participation. But no references to the themes and sub-themes like : access, benefit sharing and IPRs, peoples participation and empowerment, gender and equity issues, Customary laws and biodiversity.

5. Does the document make recommendations for follow up, which could become important indicators or directions for the NBSAP process or head towards?(e.g. does the document recommend further studies on Tenure and Biodiversity, or setting up of an institutional structure which has not yet been implemented, in which case should the NBSAP process focus on these aspects?)

There are a number of recommendations which are to be followed up. All of them are not directly related to conservation, utaslization of the existing biodiversity. Strengthening. of the existing institutions, close linking of the compartmentalized sectors, change in the institutional mechanism for enlisting public participation . Periodic review of existing laws and enforcement mechanisms should be subjected to periodic review to evaluate their adequacy and efficiency.

Any specific recommend. on how ?
Anything specific ?
Any process suggested for this?

Revised draft
8/3/2000

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• Shyamala Hiremath
• K. Manu, Mysore Amateur Naturalists — A/c
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Shift to Eastern Ghats as coord.

6. Would this document in any contradict other existing action plan, national reviews, etc, a contradiction that the NBSAP process needs to take cognizance of ?

*This document has covered all the aspect of the environmental issues and touches corporate and industrial sectors in a big way , particularly on issues related to pollution and biodiversity.

7. Is there any indication of the process carried out in making this document, was it consultative, did it take on board all the relevant sectors or society? If there is , are there some obvious major gaps, which the NBSAP can plug? Or is there no indication of the process at all?

There is no indication of the process., there may be some information regarding this to MEOF. It is sure that ,all the state level documents (under state subject category) and existing practices were not covered. State level documents related to stategy and policy should be documented and analyzed if possible in due course

— part of SSC's responsib.

Q. Overall, does the document point to ways in which the NBSAP process could avoid duplication, built on what already exists, help resolved contradictions, and home in on major gaps ?

The document covered almost all the aspects of the environment from Population control to Industrial development , conservation of natural resources to resource accounting, awareness to training etc. The document may be the first of its kind in India. Hence, all aspect , particularly Biodiversity, was not emphasized at desired level But the document-provided strong environmental support from all biodiversity issues , existing or perspective.

In the document the words " should be " were regularly used- which in some case very appropriate but in core biodiversity cases the grade of the emphasis was not clear at all. It is an important document in terms of supporting any stategy we take in NBSAP exercises.

||

Recommendations:

1. There should be a review of the state laws related to state subject, like forest, customary laws (particularly in Biodiversity rich states) which contradicts this strategy and policy document, which may jeopardize the existence of biodiversity.
2. All state level document, be enlisted and documented, in due course.
3. A 2 page gist be made from the document for all TWG, SSC and TPCG members, so that they can refer , straight way the relevant section.

— good - can he do it ?

P.C.Bhattacharjee, 27.4.2k

Revised draft
8/3/2000

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4.	TAMIL NADU	A.R. Chitrapu ~~Ex-PCCF Tamil Nadu, Forest Department, ???~~ Chairman, Rubber Coop. ~~S.K. Niraj, IFS Regional Director, MoEF???~~ Mr. Sanjay Shukla,Executive Director,Society for Social Forestry Research and Development Tamil Nadu,1C, Adwave Towers,9, South Boag Road,Thyagaraya Nagar,Chennai 600 017.Tel: (044) 4343092.E Mail: ssfrdt@vsnl.com ????	• Mr. Preston Ahimaz , Worldwide fund for Nature –India , Tamilnadu State office, 28 4th main road , CIT Nagar Chennai 600 035 • M. Raghuraman Hon . Secretary ,Madras Naturalists Society ,8 Janaki Avenue, ABHIRAMPURAM, Chennai600 018, Tel: 4997614 • Dr. Sarvesan, Madras research centre of CMFRI, , 68/1, 4th Floor, Greams Road, Madras - 600 006. Ph: 044-8253299 Fax; 044-8254252 • S. Theodore Baskaran Tel: 4425577. • Dr. T. Shekar , Director Dept. of Environment 1st floor Ashok Nagar Shopping Complex, Chennai-600083 Tel (044 4893975) • ~~Dr. Kannan, Centre for Advanced studies Marine Biology, Portonova~~ • **MSSRF** • **Prof. Dayanand , Botany Dept. Madras Christian College, Madras.** • ~~Dr. Vijayalakshmi, / Dr.Balasubramanian, Centre for Indigenous Knowledge Systems(CIKS) 47C Gandhi Mandapam Road, Kotturpuram, Chennai-600085 Tel:044 4451087, 4415862 Fax:4450214~~ • ~~Anna University, Dept. of Environment Science~~ • ~~Farmer's Movement~~ • **Tamil Nadu Agricultural University Coimbatore** • **Veterinary colleges** • ~~ZSI special office (Marine & Coral issues), Dr. Venkataraman Tel: (o)044 4942680 (R) 4450853~~ • **Dr. Cherian, Station-in-charge, ZSI Southern Region, ???** • **Nilgiri Wildlife Association, ???** • **B.J. Krishnan, Save Nilgiris Campaign, Ootacamund, ???** • **C.R. Bijoy, Tamil Nadu Human Rights ???, Coimbatore, ???** • ~~Ms. Sally Walker, Zoo Outreach Organisation, 79, Bharathi Colony, Post Box 1683 Peelamedu, Coimbatore 641 004. Tel: 0422 561087/563159, 567567/561743 Fax: 563269. Zooreach@vsnl.com~~ ▪ **Mr Shekhar, State Dept of Environment and Forests.** • Namalwar, ARISE • Sheela

• Sebastian Mathew, NFF, Ed. ~~Samudra~~ Samudra
• SACON

NBSAP Review Document

National Conservation Strategy and Policy Statement on Environment and development.

Govt. of India, Ministry of Environment and Forest , June 1992
(An assessment with respect to the utility of the document for NBSAP)

Introduction :

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JAKLITSCH, M. J.	Robertson-Walker cosmologies	
1989ApJ...341..557G GOUDA, N.;SASAKI, M.;SUTO, Y.	0.323 Evolution of perturbations in a baryon-dominated universe - Gauge-invariant analysis	6/89
1989ApJ...339L..13S STEBBINS, A.;TURNER, M. S.	0.323 Is the great attractor really a great wall?	4/89
1989A90-44077.....C CAFFO, M.;FANTI, R.; GIACOMELLI, G.;RENZINI, A.	0.323 Astronomy, cosmology and fundamental physics; Proceedings of the Third ESO-CERN Symposium, Bologna, Italy, May 16-20, 1988	0/89
1989A&A...219....7F FABBRI, R.;LUCCHIN, F.; MATARRESE, S.	0.323 The effect of primordial perturbations on the extragalactic infrared background	7/89
1988QJRAS..29..443D DAVIES, R. D.	0.323 The cosmic microwave background - Probe of the early universe	12/88
1988prun.proc..155L LINDER, E. V.	0.323 Cosmological gravitational waves	0/88
1988Natur.332..328S SUTO, Y.;GORSKI, K.; JUSZKIEWICZ, R.;SILK, J.	0.323 Probes of large-scale structure in the universe	3/88
1988N89-25105.....T TOMITA, K.	0.323 Gravitational angular fluctuations of the cosmic background radiation produced by cosmological linear perturbations	11/88
1988BAICz..39..185M MESZAROS, A.;VANYSEK, V.	0.323 A non-Friedmannian model of the universe	5/88
1988A88-39732.....U UNRUH, W. G.;SEMENOFF, G. W.	0.323 The early universe; Proceedings of the NATO Advanced Study Institute, Victoria, Canada, Aug. 17-30, 1986	0/88
1987asse.rept...57L LACHIEZEREY, M.	0.323 Background cosmological radiation	5/87
1987ApJ...314L..29V VITTORIO, N.;JUSZKIEWICZ, R.	0.323 Hot spots in the microwave sky	3/87
1987ApJ...313..517T THOMPSON, K. L.; VISHNIAC, E. T.	0.323 The effect of spherical voids on the microwave background radiation	2/87
1987A&A...179...11F FABBRI, R.;TAMBURRANO, M.	0.323 Polarization of the cosmic background radiation in magnetic Bianchi type-II cosmologies	6/87
1986nihu..470...36P PARTRIDGE, R. B.	0.323 The cosmic microwave background at its twentieth anniversary	0/86
1986nato.C162..ForS SHAPIRO, M. M.	0.323 Cosmic radiation in contemporary astrophysics; Proceedings of the Advanced Study Institute, Erice, Italy, November 4-15,	0/86

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This has partially covered SAP , as it is a *strategy and policy statement.*

3. Which of the thematic and sub-thematic areas does the document cover (see Appendices 3 and 4 of the process outline)?

Out of the 14 major themes, till now identified, it has covered partially-particularly with regard to the guidelines to : (1) livelihoods, lifestyle, and biodiversity,(2)Health and biodiversity (3) wild animal biodiversity (4) wild plant biodiversity (5) natural terrestrial ecosystems (6) natural aquatic ecosystems (7)Policies, laws and institutions (8) Education, training, awareness and research and (9) International issues (as International cooperation).

It will be of help to get the guidelines for a number of sub-themes :1. Mining and biodiversity,2. Sustainable technologies 3. Biodiversity in EIA procedures 4.Thermal power and biodiversity 5. Tourism and biodiversity 6. exotic and biodiversity 7. Local health tradition 8. water management and biodiversity.

4. What major gaps does the document leave in covering these themes and sub-themes?

The document (a stategy and policy statement on environment) has not covered majority of the themes and sub-themes identified . There are some passing references of important themes, related to peoples involvement and participation. But no references to the themes and sub-themes like *: access, benefit sharing and IPRs, peoples participation and empowerment, gender and equity issues, Customary laws and biodiversity.*

5. Does the document make recommendations for follow up, which could become important indicators or directions for the NBSAP process or head towards?(e.g. does the document recommend further studies on Tenure and Biodiversity, or setting up of an institutional structure which has not yet been implemented, in which case should the NBSAP process focus on these aspects?)

There are a number of recommendations which are to be followed up. All of them are not directly related to conservation, utaslization of the existing biodiversity. Strengthening. of the existing institutions, close linking of the compartmentalized sectors, change in the institutional mechanism for enlisting public participation . Periodic review of existing laws and enforcement mechanisms should be subjected to periodic review to evaluate their adequacy and efficiency.

6. Would this document in any contradict other existing action plan, national reviews, etc, a contradiction that the NBSAP process needs to take cognizance of ?

1986HiA.....7..297S SMOOT, G. F.	0.480 Cosmic microwave background spectrum measurements	0/86
1990PhDT.....9L LEWIS, C. M.	0.476 Peculiar cosmological velocities	0/90
1989nntra.571..214D DAVIES, R. D.;WATSON, R.; LASENBY, A. N.;REBOLO, R.; BECKMAN, J.	0.476 Sensitive CMB fluctuation searches at 10.4 GHz	0/89
1989acfp.proc..159V VITTORIO, N.	0.476 The large scale structure of the universe	0/89
1989acfp.proc..105P PARTRIDGE, R. B.	0.476 The cosmic microwave background radiation and the dog in the night	0/89
1991A91-34526.....K KOVALEVSKY, J.; PERRYMAN, M. A. C.; WESSELIUS, P. R.; BARTHEL, P. D.;SMOOT, G. F.	0.417 Infrared and radio astronomy, and astrometry; Proceedings of Symposia 7, 8, and Topical Meeting of the COSPAR 28th Plenary Meeting, The Hague, Netherlands, June 25-July 6, 1990	0/91
1993ApJ...413L..67R ROTH, K. C.;MEYER, D. M.; HAWKINS, I.	0.386 Interstellar cyanogen and the temperature of the cosmic microwave background radiation	8/93
1990PhDT.....4F FISHER, M. L.	0.386 Theoretical studies of QSO absorption lines and the intergalactic medium	0/90
1988ApJ...334...14L LEVIN, S. M.;WITEBSKY, C.; BENSADOUN, M.;BERSANELLI, M.; DE AMICI, G.	0.386 A measurement of the cosmic microwave background radiation temperature at 1.410 GHz	11/88
1991aftm.proc...95S SMOOT, G. F.;BENNETT, C. L.; KOGUT, A.;AYMON, J.; BACKUS, C.;DE AMICI, G.; GALUK, K.;JACKSON, P. D.; KEEGSTRA, P.;ROKKE, L.	0.378 Preliminary DMR measurements of the CMB isotropy	0/91
1992issacproc..331S SMOOT, G. F.	0.361 COBE DMR results and implications	0/92
1992ApJ...396L...1S SMOOT, G. F.;BENNETT, C. L.; KOGUT, A.;WRIGHT, E. L.; AYMON, J.;BOGGESS, N. W.; CHENG, E. S.;DE AMICI, G.; GULKIS, S.;HAUSER, M. G.	0.361 Structure in the COBE differential microwave radiometer first-year maps	9/92
1990gssm.rept...25M MATHER, J. C.;HAUSER, M. G.; BENNETT, C. L.;BOGGESS, N. W.; CHENG, E. S.;EPLEE, R. E. J.; FREUDENREICH, H. T.; GULKIS, S.;ISAACMAN, R. B.; JANSSEN, M.	0.361 Early results from the Cosmic Background Explorer (COBE)	12/90
1993ApJ...409L...1M MEINHOLD, P.;CLAPP, A.;	0.344 Measurements of the anisotropy of the cosmic	5/93

*This document has covered all the aspect of the environmental issues and touches corporate and industrial sectors in a big way , particularly on issues related to pollution and biodiversity.

7. **Is there any indication of the process carried out in making this document, was it consultative, did it take on board all the relevant sectors or society? If there is , are there some obvious major gaps, which the NBSAP can plug? Or is there no indication of the process at all?**

There is no indication of the process., there may be some information regarding this to MEOF. It is sure that ,all the state level documents (under state subject category) and existing practices were not covered. State level documents related to stategy and policy should be documented and analyzed if possible in due course

Q. Overall, does the document point to ways in which the NBSAP process could avoid duplication, built on what already exists, help resolved contradictions, and home in on major gaps ?

The document covered almost all the aspects of the environment from Population control to Industrial development , conservation of natural resources to resource accounting, awareness to training etc. The document may be the first of its kind in India. Hence, all aspect , particularly Biodiversity, was not emphasized at desired level But the document-provided strong environmental support from all biodiversity issues , existing or perspective.

In the document the words " **should be** " were regularly used- which in some case very appropriate but in core biodiversity cases the grade of the emphasis was not clear at all. It is an important document in terms of supporting any stategy we take in NBSAP exercises.

Recommendations:

1. **There should be a review of the state laws related to state subject, like forest, customary laws (particularly in Biodiversity rich states) which contradicts this strategy and policy document, which may jeopardize the existence of biodiversity.**
2. **All state level document, be enlisted and documented, in due course.**
3. **A 2 page gist be made from the document for all TWG, SSC and TPCG members, so that they can refer , straight way the relevant section.**

P.C.Bhattacharjee, 27.4.2k

DEVLIN, M.;FISCHER, M.;
GUNDERSEN, J.;HOLMES, W.;
LANGE, A.;LUBIN, P.;
RICHARDS, P.;SMOOT, G.

background radiation at 0.5 deg scale near the star Mu Pegasi

1991aftm.proc..123F
FISCHER, M. L.;ALSOP, D. C.;
CLAPP, A. C.;
COTTINGHAM, D. A.;
LANGE, A. E.;RICHARDS, P. L.;
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KOCH, T. C.;MEINHOLD, P. R.

0.344 0/91
A millimeter-wave anisotropy experiment (MAX) to search for anisotropy in the cosmic background radiation on medium angular scales

1989rges.rept..114B
BENNETT, C. L.;SMOOT, G. F.

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The COBE cosmic 3 K anisotropy experiment: A gravity wave and cosmic string probe

1993PhRvL..70.2371G
GRISHCHUK, L. P.

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Cosmological perturbations of quantum-mechanical origin and anisotropy of the microwave background

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KOFMAN, L. A.;GNEDIN, N. Y.;
BAHCALL, N. A.

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Cosmological constant, COBE cosmic microwave background anisotropy, and large-scale clustering

1993ApJ...405....8M
MYERS, S. T.;
READHEAD, A. C. S.;
LAWRENCE, C. R.

0.340 3/93
Limits on the anisotropy of the microwave background radiation on arcminute scales. II - The ring experiment

1993ApJ...405....1M
MAKINO, N.;SUTO, Y.

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Anisotropies in the microwave background due to the Sunyaev-Zel\'dovich effect from virialized objects at high redshifts

1992Natur.357..660W
WATSON, R. A.;
DE LA CRUZ, C. M. G.;
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HANCOCK, S.

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Anisotropy measurements of the cosmic microwave background radiation at intermediate angular scales

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KLYPIN, A. A.;STRUKOV, I. A.;
SKULACHEV, D. P.

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The Relikt missions - Results and prospects for detection of the microwave background anisotropy

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WHITE, S. D. M.

0.340 9/92
COBE background radiation anisotropies and large-scale structure in the universe

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VILLALBA, V. M.;PERCOCO, U.

0.340 3/92
Vacuum effects in a spatially homogeneous and isotropic cosmological background

1992ApJ...395L..59G
GOUDA, N.;SUGIYAMA, N.

0.340 8/92
Surviving cosmological models after the discovery of large-angle anisotropies of the cosmic microwave background

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SUGIYAMA, N.;SATO, K.

0.340 3/92
Constraints on cosmological models with the decaying cosmological constant from cosmic background radiation anisotropies

NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (NBSAP)

ASSESSING EXISTING NATIONAL DOCUMENTS RELEVANT TO NBSAP

A Synthesis of the Findings

INTRODUCTION: WHY THE ASSESSMENTS?

The National Biodiversity Strategy and Action Plan (NBSAP) process is not the first exercise in India to prepare environment related action plans and policies. There are several predecessors, and it is vital that the NBSAP process builds on them rather than re-invent the wheel.

In an effort to assess what already exists at a national level (an exercise that state level agencies will also have to do for their respective states), members of the NBSAP Technical and Policy Core Group were requested to examine a series of documents. These included:

1. National Report on Implementation of Article 6 of the Convention on Biological Diversity, 1998
2. National Policy and Macrolevel Action Strategy on Biodiversity, 1999
3. Environment Action Programme (EAP) 1993
4. National Conservation Strategy and Policy Statement on Environment and Development 1992
5. National Forestry Action Plan 1999 (NFAP)
6. Biodiversity Conservation Prioritisation Project (BCPP) reports, 1999
7. Reports of the International Development Research Centre on medicinal plants

The National Wildlife Action Plan (in process) was also to be reviewed, but given that it was only in draft stage and subject to further modification, its review was postponed.

METHODOLOGY: WHAT PARAMETERS WERE ASSESSED?

The following major questions were asked in doing these reviews:

1. How much or which of the NBSAP scope and aspects (see Sections 1 and 3 of the Process Outline) does the document cover?
2. Is this coverage adequate in terms of the points that an Action Plan should contain (see Section 2 of the Process Outline)?
3. Which of the thematic and sub-thematic areas does the document cover (see Appendices 3 and 4 of the Process Outline)?
4. What major gaps does the document leave in covering these themes and sub-themes?
5. Does the document make recommendations for follow-up, which could become important indicators or directions for the NBSAP process to head towards? (e.g. does the document recommend further studies on Tenure and Biodiversity, or the setting up of an institutional structure which has not yet been implemented, in which case should the NBSAP process focus on these aspects?).
6. Would this document in any way contradict other existing action plans, national reviews, etc., a contradiction that the NBSAP process needs to take cognizance of?
7. Is there any indication of the *process* carried out in making this document, was it consultative, did it take on board all the relevant sectors of society? If there is, are there some obvious major gaps, which the NBSAP process can plug? Or is there no indication of the process at all?

Equations (2.11), (2.7) and (2.6) give

$$\gamma = \frac{P}{\rho} + 1 = 2\left\{\frac{2}{3}(\phi')^2 + \frac{4}{3}\frac{a'}{a}\phi\,\phi' + \frac{1}{3}a^2\phi\frac{dV}{d\phi} + \frac{2}{3}\phi^2\left[1+\left(\frac{a'}{a}\right)^2\right]\right\}$$
$$\cdot\left\{(\phi')^2 + 2\frac{a'}{a}\phi\,\phi' + 2a^2V + \phi^2\left[1+\left(\frac{a'}{a}\right)^2\right]\right\}^{-1}, \qquad (4.2)$$

from which we get

$$V = \frac{1}{2\gamma a^2}\left(\frac{4}{3}-\gamma\right)\left\{(\phi')^2 + 2\frac{a'}{a}\phi\,\phi' + \phi^2\left[1+\left(\frac{a'}{a}\right)^2\right]\right\} + \frac{1}{3\gamma}\phi\frac{dV}{d\phi}. \qquad (4.3)$$

Now, using eqs. (2.6) and (3.2) in eq. (2.9) we find

$$V(\eta) = -\frac{1}{2a^2}(\phi')^2 - \frac{3}{2a^2}\left(\frac{\phi^2}{3}-\frac{1}{4\pi}\right)\left[\left(\frac{a'}{a}\right)^2+1\right] - \frac{a'}{a^3}\phi\,\phi'. \qquad (4.4)$$

Substituting the value of $dV/d\phi$ given by eq. (4.1) into eq. (4.3), and the result into eq. (4.4), we find

$$\phi\phi'' - 2\frac{a'}{a}\phi\phi' - 2(\phi')^2 + \phi^2\left[\frac{a''}{a} - 2\left(\frac{a'}{a}\right)^2 - 1\right] + \frac{9\gamma}{8\pi}\left[\left(\frac{a'}{a}\right)^2+1\right] = 0. \qquad (4.5)$$

The last equation can be solved numerically in the prematter era, once the parameter γ_p is fixed, and initial conditions ϕ_0, ϕ_0' are specified. Then, one can solve numerically for the values of $\phi'(\eta)$ and $V(\eta)$ from eq. (4.4) and, by eliminating the conformal time, one obtains a numerical form for the scalar field potential $V(\phi)$. Using the MAPLE computer program, we have done this for $\gamma_p = 2.0153\cdot 10^{-3}$ (corresponding to Table 6). The result is plotted in two different ranges of values of ϕ. The resulting $V(\phi)$ does not depend on the particular solution $\phi(\eta)$ coming from specific initial data (ϕ_0, ϕ_0'), as must be the case. Integration gives only narrow ranges of $\phi(\eta)$ for given initial conditions, so the relation $\phi - V$ is plotted in narrow windows spanning only a part of the possible range of values of ϕ. We treat the initial conditions as arbitrary. The question if there are preferred initial conditions, and then a corresponding particular range for ϕ remains an open problem.

The features of the resulting $V(\phi)$ are as follows: the scalar field potential has the symmetry $V(\phi) = V(-\phi)$, as to be expected from an examination of eq. (4.4), and for

Overall, the reviews were to indicate the following: does the document point to ways in which the NBSAP process could avoid duplication, build on what already exists, help resolve contradictions, and home in on major gaps?

In addition, individual members of the TPCG assessed these reports from the point of view of their own expertise or experience, e.g. whether the documents contained enough emphasis and action points on marine issues, or on medicinal plants.

SYNTHESIS: MAJOR CONCLUSIONS OF THE REVIEWS

The following broad observations emerged (these may not all be relevant to each document, but are part of a general picture):

1. These documents could serve as useful starting points for the various executing agencies of the NBSAP, in particular the Thematic Working Groups (TWGs), and some State Steering Committees (SSCs). For this, MoEF should be requested to provide all relevant reports/documents which were used to prepare the national level documents, e.g. thematic reports on Institutional Structures for Environment, as part of the Environment Action Programme 1993; or state-level forestry sector review as part of the NFAP 1999.
2. The documents provide a useful policy (and in some cases, strategy) base to build on, which the NBSAP executing agencies should not duplicate. In particular, the Macro-level Action Strategy, and the National Conservation Strategy, could form the baseline for all the NBSAP executing agencies.
3. Specific sections in the documents that would be relevant for each TWG and SSC, or to other executing agencies of the NBSAP, would be identified for the benefit of these agencies.
4. All documents (with the partial exception of the NFAP and the BCPP reports) restrict themselves to strategies, but do not go much into concrete actions and means to achieve them. Thus the NBSAP has the function of building on them to suggest concrete, implementable actions with estimates of resources/humanpower/expertise/institutions needed.
5. Some themes to be covered by the NBSAP were either not covered or covered inadequately in the documents. In particular, the linkages between natural resources and health, culture, livelihoods, technology and economics, was poorly developed. It may therefore be necessary to give these themes greater focus in the NBSAP.
6. Conversely, some themes were substantially covered (e.g. wild animal diversity under BCPP, forests under NFAP), and the NBSAP could focus on covering the gaps in these.
7. The process of these documents preparation did not appear to as participatory as the NBSAP proposes to be. The NBSAP process was therefore critical in that views and participation of diverse sections of the society would be incorporated when formulating the plan.
8. Most of the documents suggested people's participation as part of strategy/policy, but did not go into concrete measures to do this. In particular, issues of people's empowerment to take part in decision-making regarding natural resources, or their involvement right from the initiation of policy and strategic planning, was not highlighted in most documents. The NBSAP therefore needs to fill this critical gap.
9. There is a need to assess implementation and current status of the strategies/action plans and programmes suggested in these documents, especially the Conservation Strategy 1992 and the Environment Action Programme 1993, as these had been in operation for several years now. However, such monitoring and evaluation seemed to be absent, which pointed to a critical gap that NBSAP needs to fill.

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Impossible Measurements on Quantum Fields*

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Abstract

It is shown that the attempt to extend the notion of ideal measurement to quantum field theory leads to a conflict with locality, because (for most observables) the state vector reduction associated with an ideal measurement acts to transmit information faster than light. Two examples of such information-transfer are given, first in the quantum mechanics of a pair of coupled subsystems, and then for the free scalar field in flat spacetime. It is argued that this problem leaves the Hilbert space formulation of quantum field theory with no definite measurement theory, removing whatever advantages it may have seemed to possess vis a vis the sum-over-histories approach, and reinforcing the view that a sum-over-histories framework is the most promising one for quantum gravity.

1. INTRODUCTION: IDEAL MEASUREMENTS AND QUANTUM FIELD THEORY

Whatever may be its philosophical limitations, the textbook interpretation of non-relativistic quantum mechanics is probably adequate to provide the quantum formalism with all the predictive power required for laboratory applications. It is also self-consistent in the sense that there exist idealized models of measurements which allow the system-observer boundary to be displaced arbitrarily far in the direction of the observer. And the associated "transformation theory" possesses a certain formal beauty, seemingly realizing the "complementarity principle" in terms of the unitary equivalence of all orthonormal bases. It is therefore natural to try to generalize this semantic framework to relativistic quantum field theory in the hope of learning something new, either from the success or failure of the attempt.

In fact we will see that the attempt fails in a certain sense; and the way it fails suggests that the familiar apparatus of states and observables must give way to a more spacetime-oriented framework, in which the new physical symmetry implied by the "transformation theory" is lost, and the role of measurement as a fundamental concept is transformed or eliminated. Although such a renunciation of the usual

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(This synthesis was prepared by Ashish Kothari, Coordinator of the TPCG, based on reviews done by TPCG members MVM Wafar, Seema Bhatt, Bansuri Taneja, Darshan Shankar, PC Bhattacharjee, and V. Shruti Devi.)

measurement formalism might seem a step backwards for quantum field theory, it can also be viewed as a promising development for quantum gravity. It means that some of the conceptual problems which are normally thought of as peculiar to quantum gravity or quantum cosmology are already present in flat space, where their analysis and resolution may be easier.

The framework we will attempt to generalize is based on the notion of an *ideal measurement*, by which I mean one for which (*i*) the possible outcomes are the eigenvalues of the corresponding operator, realized with probabilities given by the usual trace-rule, and (*ii*) the standard *projection postulate* correctly describes the effect of the measurement on the subsequent quantum state. Such a "minimally disturbing measurement" is not only a "detection" but is simultaneously a "preparation" as well and, if one follows the textbook interpretation, it is precisely from this dual character of measurement that the predictive power of the quantum mechanical formalism derives. It is also from this dual aspect that the difficulty in relativistic generalization will arise—a difficulty with so-called superluminal signaling.

Now in non-relativistic quantum mechanics, measurements are idealized as occurring at a single moment of time. Correspondingly the interpretive rules for quantum field theory are often stated in terms of ideal measurements which take place on Cauchy hypersurfaces. However, in the interests of dealing with well-defined operators, one usually thickens the hypersurface, and in fact the most general formulations of quantum field theory assume that there corresponds to any open region of spacetime an algebra of observables which—presumably—can be measured by procedures occurring entirely within that region. (Unlike for the non-relativistic case, however, no fully quantum models of such field measurements have been given, as far as I am aware.)

The statement that "one can measure" a single observable A associated to a spacetime region O is fine as far as it goes, and an obvious generalization of the projection postulate can be adopted as part of the definition of such a measurement. But a potential confusion arises as soon as we think of two or more separate measurements being made. In the non-relativistic theory, measurements carry a definite temporal order from which the logical sequence of the associated state-vector reductions is derived; but in Minkowski space, the temporal relationships among regions can be more complicated, and the rules for "collapsing" the state are not necessarily evident. Nonetheless, I claim that a natural set of rules exists, which directly generalizes the prescription of the non-relativistic theory.

2. A RELATIVISTIC PROJECTION POSTULATE

The problem is that these "obvious" rules fail to be consistent with established ideas of causality/locality. Hence, the kind of measurements they envisage can presumably not be accomplished. It would of course be very interesting to try to construct models within quantum field theory, to see what goes wrong, but I will not attempt such a von-Neumann-like analysis here. Also, I will restrict myself to flat-space for definiteness, although nothing would be changed by going over to an arbitrary globally hyperbolic spacetime. Finally it seems most convenient to work in the Heisenberg picture, since the association of field operators to regions of spacetime is most direct in that picture.

NBSAP Review Document

THE NATIONAL FORESTRY ACTION PLAN 1999

(Note: this is as yet incomplete, there is a need to cross-refer each point to specific sections of the NFAP to enable clearer analysis).

INTRODUCTION

The Ministry of Environment and Forests, Government of India, released an ambitious National Forestry Action Plan (NFAP) in late 1999. The NFAP is a two-volume, detailed document, itself a consolidation of state-level forestry action plans and reviews, and several thematic reviews. It is the first time that India has come up with a such a plan.

Clearly the NFAP has a lot of overlap with the subject matter of the NBSAP. What follows is an attempt to delineate, in brief, what this overlap is, what the potential complementarities and conflicts between the two processes are, and what gaps remain in the forestry sector that the NBSAP needs to plug[1].

ASSESSMENT OF RELATIONSHIP BETWEEN NFAP AND NBSAP

1. How much or which of the NBSAP scope and aspects (see Sections 1 and 3 of the Process Outline) does the document cover?

The NFAP covers a major part of the one of the elements of coverage: *Natural Ecosystems.* In addition, in so far as it deals with tree plantations, it covers a part of another element: *Agricultural Ecosystems.* Other elements, such as *Wild Species* and *Domesticated Species,* are only indirectly covered.

In terms of geographical scope, the NFAP in itself is at a *national* (aggregate) level, but the documents that went into its making, and which are presumably separately available, are also at *state/U.T.* level. Sub-state or local level, as also the inter-state ecoregional level, are not covered.

Finally, in terms of aspects of coverage, the NFAP covers *conservation* and *sustainable use* in some detail, but its coverage of *equity, ethical,* and other aspects is cursory.

2. Is this coverage adequate in terms of the points that an Action Plan should contain (see Section 2 of the Process Outline)?

Of the 9 items that are listed in Section 2 (What is a Strategy and Action Plan?) of the NBSAP Process Outline, the NFAP covers:

- Items 1 to 5 in detail;
- Items 6, 7, and 9 in much less detail, or rather inadequately; and
- Item 8 not at all, though it is reported that this is happening post-NFAP in the Ministry of Environment and Forests and in state governments (Pers. Comm., DIG Forests, MoEF).

Overall, the NFAP is more a *strategy* than an *action plan,* in that it gives broad recommendations for action and gives general costing for this (it is possible that the state-level action plans do this, but they are not available for review). It does not lay out in much detail, concrete steps with time and cost budgeting for each step, institutional structures and resource persons/organisations needed for each follow-up action, and so on. This exercise is reportedly underway now, with the formulation of specific project proposals, though no more details are available at this stage.

3. Which of the thematic and sub-thematic areas does the document cover (see Appendices 3 and 4 of the Process Outline)?

---

[1] This review follows the structure laid out in the NBSAP TPCG document "Tips on Reviewing Documents".

Response Form *

(Please tick the appropriate box in each case)

1. Have you been active in terms of research/teaching/dissemination in the field of Astronomy and Astrophysics (A&A) for the past three years (1993-96)?

   Yes [✓] No [ ]

2. Do you wish to retain your membership of the IAU, keeping in mind the difficulties mentioned in the attached letter.

   Yes [✓] No [ ]

3. ~~If the answer to Q. 2 is 'No',~~ do you hereby resign voluntarily your membership of the IAU to make way for new members?

   Yes [ ] No [✓]

4. If the answer to Q. 2 is 'Yes', please give a brief account of your activities in A & A during 1993-96 under the following headings below :

   Research Publications : _____

   Teaching Assignments: _____

   See enclosed material

   Dissemination, Popularisation : _____

5. To update the database of INC-IAU please complete the details below :

   Name : T. Padmanabhan

   Affiliation : IUCAA

   Address : Post Bag 4, Pune University Campus, Ganeshkhind, Pune 411 007

   Fax : (212)-350760

   E-mail : paddy@iucaa.ernet.in

→

Of the NBSAP's 14 major themes (Appendix 3, Process Outline), the NFAP clearly and substantively covers a part of Theme 8 (Natural Terrestrial Ecosystems). In addition, it also covers some or many elements of Theme 1 (Economics and Valuation), 2 (Livelihoods), 11 (Policies, Laws, Institutions), 13 (Education, Training, Awareness, Research), and 14 (Technology and Industry).

Of the NBSAP's first list of sub-thematic areas or topics (Appendix 4, Process Outline), the NFAP covers the following in greater or lesser detail: 1 (History of Biodiversity Conservation), 5 (Sustainable Technologies), 8 (Enterprise), 9 (Plantations), 21 (Private lands), 23 (Innovative Ways of Funding), and 30 (Impact of Current Forestry Practices on Biodiversity).

4. What major gaps does the document leave in covering these themes and sub-themes?

It prominently misses out on Theme no. 3 (Culture and Biodiversity), and Sub-Theme no. 6 (Community Conserved Areas), both considered crucial to the NBSAP. Its coverage of Theme no. 12 (Access, Benefit-sharing and IPRs) is also extremely weak. In its coverage of Theme no. 2 (Livelihoods, Lifestyles), it is weak on issues of forest-based tenure and rights (though this is mentioned in a few places), and on tackling unsustainable patterns of consumption of forest produce of the urban elite.

5. Does the document make recommendations for follow-up, which could become important indicators or directions for the NBSAP process to head towards? (e.g. does the document recommend further studies on Tenure and Biodiversity, or the setting up of an institutional structure which has not yet been implemented, in which case should the NBSAP process focus on these aspects?).

Several of the recommendations of the NFAP need to be followed up, since (as stated above), they are not yet translated into concrete steps for action. In addition, issues such as the integration of biodiversity concerns into all forestry activities, forest-based tenure and rights, innovative institutional mechanisms for forest regeneration and conservation, innovative mechanisms for fund-raising, and so on, have been mentioned, but need to be understood and made 'actionable' through follow-up activities. Many of these are within the purview of the NBSAP.

6. Would this document in any way contradict other existing action plans, national reviews, etc., a contradiction that the NBSAP process needs to take cognizance of?

The NFAP itself contains some contradictory pulls, e.g. it mentions community based mechanisms and the need to guarantee clear tenure and rights to local communities over forest resources, but at the same gives prominence to commercialising and privatising forest resources. This latter thrust could also be contradictory to the need for biodiversity conservation within all forestry activities.

Many of the recommendations of the NFAP would need considerable changes in the existing forest laws of the country, a point that it itself makes, but does not go into great detail. In addition, some of these recommendations (especially on biodiversity conservation and local community tenurial security) would require changes in the institutional structures handling forests, a widespread re-orientation of the existing forest bureaucracy, and changes in policies and laws that govern the extraction and use of resources in forest lands (e.g. mining, industrial siting and raw material use, and so on). Finally, the NFAP does not bring out the relationship of forest activities with the recent panchayat legislation, in particular the Panchayat (Extension to Scheduled Areas) Act 1996, which is critical if rural communities are to be brought squarely into the regeneration, conservation, and management of forests in the country. These are aspects that the NBSAP could profitably go into.

7. Is there any indication of the *process* carried out in making this document, was it consultative, did it take on board all the relevant sectors of society? If there is, are there some obvious major gaps, which the NBSAP process can plug? Or is there no indication of the process at all?

There appears to be no detailed documentation of the process carried out. Indications are that the project was mainly handled by the forest bureaucracy and some outside consultants (some of whom were also retired forest officials or NGOs set up by such officials). There is little indication that public hearings

1991

81. **T.Padmanabhan**, Vacuum polarisation around an Aharonov - Bohm solenoid, *Pramana - Jour. Phys.*, **36**, 253 (1991).
82. **Review article**: J.V.Narlikar and **T.Padmanabhan**, Inflation for astronomers, *Ann. Rev. Astron. Astrophys.*, **29** 325 (1991)
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87. **T.Padmanabhan**, Structure formation in the universe: Comparison of some observations and models, *Curr. Science*,**63**,379 (1992).
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91. **T.Padmanabhan** and K. Subramanian, Zeldovich approximation and the probability distribution for the smoothed density field in the nonlinear regime, *Ap.J*, **410**, 482 (1993).
92. **T.Padmanabhan** and K. Subramanian, Aspects of Zeldovich approximation, *Ap.J*, **417**, 3, (1993).
93. K. Subramanian and **T.Padmanabhan**, Neutral Hydrogen at high redshifts as a probe of structure formation: 1. Post-COBE analysis of CDM and HDM models, *MNRAS*, **265**, 101, (1993).

were held, grass-roots organisations consulted, or local or national wildlife/biodiversity conservation organisations involved in the actual formulation of the NFAP. However, some of this may have happened at the level of some states, but details of this are not available as yet. If indeed these are major gaps in the *process* by which the NFAP was formulated, then this is a major area of activity for the NBSAP.

Q: OVERALL, DOES THE DOCUMENT POINT TO WAYS IN WHICH THE NBSAP PROCESS COULD AVOID DUPLICATION, BUILD ON WHAT ALREADY EXISTS, HELP RESOLVE CONTRADICTIONS, AND HOME IN ON MAJOR GAPS?

A closer examination is needed of the NFAP, and of the various state level plans and reviews, to answer this in detail. It appears from the first examination that quite a bit of basic information/data on forests and their status have been compiled, several thematic reviews have been done, broad analysis has been attempted, and at least some state-level action plans have substantial details. These will all be useful beginning points for the NBSAP in its national, thematic, and state level processes.

RECOMMENDATIONS

It is suggested that:

1. The IGF's office be asked about what it perceives to be the potential relationship between the NFAP and the NBSAP, to both avoid duplication and to synergise the initiatives.
2. A closer examination of the recommendations of the NFAP and its budgeting be carried out, from the point of view of its relevance for NBSAP. This could be done for the whole NFAP by the TWG on Natural Terrestrial Ecosystems, as also for specific relevant parts of the NFAP, by the TWGs on Livelihoods, Domesticated Biodiversity, Economics and Valuation, Policies/Laws/Institutions, Education/Research, and Technology/Industry.
3. State level reviews and action plans carried out as part of the NFAP process, be made available to each SSC in the NBSAP process, to enable them to closely examine these documents for the same purpose.
4. Thematic reviews carried out as part of the NFAP process, be made available to the relevant TWGs of the NBSAP process.

Ashish Kothari
8 April, 2000

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74. T.R. Seshadri and **T.Padmanabhan**, Gaussian states in the De-Sitter spacetime and the evolution of semiclassical density perturbations: 1. Homogeneous mode *Jour.Astrophys. Astron.* **10**, 391 (1989).
75. T.R. Seshadri and **T.Padmanabhan**, Gaussian states in the De-Sitter spacetime and the evolution of semiclassical density perturbations: 2.Inhomogeneous modes *Jour.Astrophys. Astron.* **10**, 407 (1989).

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76. **T.Padmanabhan** and T.P. Singh, On the semiclassical limit of Wheeler-DeWitt equation *Class. Quan. Grav.*. 7, 441 (1990)
77. **Review article: T.Padmanabhan**, Statistical mechanics of gravitating systems, *Phys. Rept.* **188**, 285 (1990).
78. **T.Padmanabhan**, The physical interpretation of quantum field theory in non-inertial co-ordinate systems, *Phys.Rev.Letts.*,**64**, 2471(1990).
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(Based on the 1st draft of Ashish Kothari Dated 8.4.2000, revised by B.M.S Rathore, Dated 30.4.2000)

NBSAP Review Document

THE NATIONAL FORESTRY ACTION PLAN 1999

INTRODUCTION

The Ministry of Environment and Forests, Government of India, released an ambitious National Forestry Action Plan (NFAP) in late 1999. The NFAP is a two-volume, detailed document, itself a consolidation of state-level forestry action plans and reviews, and several thematic reviews. It is the first time that India has come up with a such a plan.

Clearly the NFAP has a lot of overlap with the subject matter of the NBSAP. What follows is an attempt to delineate, in brief, what this overlap is, what the potential complementaries and conflicts between the two processes are, and what gaps remain in the forestry sector that the NBSAP needs to plug[1].

THE CONTENT OF THE NFAP DOCUMENT : The NFAP document runs through two volumes and an Executive Summary. Over all structure of the document is as under :

- Introduction
- Status of Forestry in India
- Outlook for Forestry
- Problems & Constraints of Forestry Sector
- Issues and Opportunities
- Programme Package
- Investment Proposals

ASSESSMENT OF RELATIONSHIP BETWEEN NFAP AND NBSAP

1. How much or which of the NBSAP scope and aspects (see Sections 1 and 3 of the Process Outline) does the document cover?

The NFAP covers a major part of the one of the elements of coverage: *Natural Ecosystem* . However, the primary focus has been on the terrestrial ecosystem- aquatic ecosystem has a limited reference. In addition, in so far as it deals with tree plantations, it covers a part of another element: *Agricultural Ecosystems.* Other elements, such as *Wild Species* and *Domesticated Species,* are only indirectly covered.

In terms of geographical scope, the NFAP in itself is at a *national* (aggregate) level, but the documents that went into its making, and which are presumably separately available, are also at *state/U.T.* level. Sub-state or local level, as also the inter-state ecoregional level, are not covered.

Imp. gap - but check state APs

Finally, in terms of aspects of coverage, the NFAP covers *conservation* and *sustainable use* in some detail, but its coverage of *equity, ethical,* and other aspects is cursory.

2. Is this coverage adequate in terms of the points that an Action Plan should contain (see Section 2 of the Process Outline)?

Of the 9 items that are listed in Section 2 (What is a Strategy and Action Plan?) of the NBSAP Process Outline, the NFAP covers:

- Items 1- The Problem Statement: The document has a clear statement of the problem (vol II section 1 on problem and constraints), and the problem statement is revisited at several places in subsequent section.
- Item no. 2 -Identification of ongoing initiatives regarding the issue: The document has a comprehensive coverage on current status of forestry in India(section 3 of Vol. I)
- Item no. 3- Identification of key actors involved: The document has place for a range of players both govt. agencies as well as non . govt. organization and the private sector initiatives in the forestry sector

communities?

[1] This review follows the structure laid out in the NBSAP TPCG document "Tips on Reviewing Documents".

The entire peoject also visualises four lift irrigation schemes. Among thse are: Tekepar (to irrigate 6824 ha.), Ambhora (8481 ha.), Mokhebardi (20880 ha.) and Paghora (21728 ha.).

The project will affect 200 villages in the three distrits of Bhandra, Nagpur and Chandrapur and their breakup is: Bhandara:104.Nagpur:85 and Chandrapur:11. Of thse villages, 73 will be fully affected, while 17 would be partially affected. Only farm land will be submerged in 110 villages. Incidentally, the project report prepared in 1982 mentioned the number of affected villages as 143. but the note dated 6-8-1997 says that 200 villags would be affected.

The 1982 project report placed the number of PAPs (project affected persons) as 81623 in five tehsils of Bhandara and Nagpur districts. However, after the Statutory Board for Development of Vidarbha was constituted, it placed the number of PAPs at 67287 —27569 in Bhandara district, 33470 in Nagpur and 6248 in Chandrapur district. It may be noted here that the number of PAPs has miraculously 'decreased' between 1982 and 1997.

Rehabilitation

Gosekhurd rehabilitation divisions both at Nagpur and Bhandara have in a note circulated in September 1998 given the following stagewise figures of villages in respect of rehabilitation:

	Bhandara	Nagpur	Chandrapur	Total
Upto June 1999	3	3	0	6
Upto June 2000	12	12	0	24
Upto June 2001	10	18	2	30
Upto June 2002	11	18	6	35
Total	36	51	8	95

Project Expenditure

The cost of the project has kept on escalating with every passing year after the project report was prepared. In 1982 it was Rs 372 crores, in 1988 Rs 461 crores and in 1995 2091 crores. What the final figures would be is anybody's guess.

According to the rates obtaining in 1995-96 the total expenditure on rehabilitation was 90 crores.However, till March 1997 only around Rs 1 crore were spent on rehabilitation.

In so far as land acquisition is concerned, in 1995-96 an estimated cost of Rs 84.8 crores was visualised for acquisition. However, till March 97 only around Rs 4.93 crores were spent actually on land acquisition.

Between 1980-81 and March 1997 a sum of Rs 195.3 crores was spent on the dam and related activities and this constitutes around ten per cent of the total cost, Which in turn means 90 percent of the visulaised funds will have to be spent in a span of four years since work on the project should be completed by 2002. Cost escalation has not been taken in account.

- Item no. 4 &5 - Identification of the major gaps in the coverage and the strategies to plug the gaps and improve ongoing initiatives: Section II of vol.I and section I of vol. II pick up the gaps, section II of vol. II deals with the strategies by spelling out the issue at hand the opportunity found therein.
- Items no. 6- List of measures and actions : Section II of vol. II lists action proposals for each of the issue at hand, though the actions are not prioritized in terms of importance and immediacy.
- Item no. 7 and 9- Resources needed for implementation including institutions, policy and legal measures, funds, human resources, monitoring structures etc. and the time frame involved therein:
  Section II; (2.21, 2.18) of vol. II spells out the kind of institutional restructuring required and the supportive policy and legal imperatives for getting the provisions of the NFAP in place. Section 2.15 deals with the HRD in the context of NFAP and includes measures to improve overall human resource development. Fund requirements for the NFAP has substantially been dealt in section 4 of Vol. II under heading- Investment Proposals. The document also puts the NFAP in line with 5 year plans.

- Item 8- Specific Project Proposals: The document has serious limitations on this front, though it is reported that this is happening post-NFAP in the Ministry of Environment and Forests and in State Governments (Pers. Comm., DIG Forests, MoEF).

Overall, the NFAP is more a *strategy* than an *action plan,* in that it gives broad recommendations (Action Proposals) for action and gives general costing for this (it is possible that the state-level action plans do this, but they are not available for review). It does not lay out in much detail, concrete steps with time and cost budgeting for each step, institutional structures and resource persons/organisations needed for each follow-up action, and so on. This exercise is reportedly underway now, with the formulation of specific project proposals, though no more details are available at this stage.

3. Which of the thematic and sub-thematic areas does the document cover (see Appendices 3 and 4 of the Process Outline)?

Of the NBSAP's 14 major themes (Appendix 3, Process Outline),
The NFAP has substantial coverage of following themes:

NBSAP Themes	**Coverage in NFAP**
Theme 8 (Natural Terrestrial Ecosystems)	NFAP Vol. I section 2.2
Theme 1 (Economics and Valuation)	NFAP Vol. II section1.4
Theme 5 (Domesticated Biodiversity)	NFAP Vol.
Theme11 (Policies, Laws, Institutions)	NFAP Vol. II-2.8 policy and legislation; 2.21 Restructuring of the Institutions
Theme13 (Education, Training, Awareness, Research)	NFAP Vol II - 2.15 Skill development and capacity building; 2.13 Research ; 2.14 Awareness , also refer Vol I -2.14, 2.15, 2.16 for Research Extension and HRD)
Theme14 (Technology and Industry).	NFAP Vol. II section 2.13

The NFAP has partial coverage of themes as below:

Theme2 (Livelihoods)	NFAP Vol. II-section2.4
Theme 6 (Wild Biodiversity - Animals)	NFAP Vol. II- section 2.3; Vol. I section 1.6.2 and section 2.7.2
Theme7 (Wild Biodiversity - Plants)	NFAP Vol. II-section 2.3, 2.5, 2.6 ; Vol. I section 1.6.1, 2.7.2

The NBSAP also conforms to some of the cross cutting themes put up in the NBSAP like Stakeholder's Participation (NFAP Vo. I section 2.11 & Vol II section 2.17). Some of the studies commissioned on the NFAP like gender in forestry could as well be made use by NBSAP TWGs.
Of the NBSAP's first list of sub-thematic areas or topics (Appendix 4, Process Outline), the NFAP covers the following in greater or lesser detail: 1 (History of Biodiversity Conservation), 5 (Sustainable Technologies), 8 (Enterprise), 9 (Plantations), 21 (Private lands), 23 (Innovative Ways of Funding), and 30 (Impact of Current Forestry Practices on Biodiversity).

4. What major gaps does the document leave in covering these themes and sub-themes?

The 1982 project report must have taken into consideration the 1971 census figures. The project as it stands now should take into account the latest census figures which will prove that the number of PAPs has gone up substantially.

PAPs Rise In Protest

After the project was given publicity by the State Government, as has been the wont of the administration a rosy picture was painted. The **"SUJALAM, SUFALAM"** swan song was played. But once the people likely to be affected by the project were enlightened and educated about the grim realities, they decided to hit back at the patently unjust project which will in the name of development destroy thousands of families, nay lead them on the path of slow, painful death.

The first step in the direction of educating the people was taken in 1994-95 when a team of dedicated activists from Nagpur conducted a survey in villages that fall in the submergence zone. Ofcourse, such a survey would not have been possible without the active support of some villagers. The survey covered 500 households in the area and revealed that there were many omissions from the list of PAPs. Also, the surevey revealed that the people, basically farmers, were not prepared for a traumatic change in their life after socalled rehabilitation. However, some of the interviewees favoured the land-for-land principle and said they would be happy if alternate land were to be made available to them.

Incidentally, the number of PAPs,according to the Gosekhurd Prakalpagrasta Sangharsha Samiti, would be in the range of 1.9 lac and not 67287 as claimed by the State Government.

Sporadic incidents of protest marked the year 1996, but as work on the project came to be accelerated, people started realising the gravity of the situation. Having realised that the project would spell disaster for them, they started gathering under the banner of the Samiti and launched a series of actions to protest the unjust project.

Every single dweller in the villages falling in the submergence zone now knows and realises that fight he must to secure his interests. The awakening exercise is an ongoing activity and in May 1999, a 10-day Sangharsha Yatra was organised in the Wainganga valley.

This protest was preceded by yet another protest on February 22, 1999 when between 15 and 20 thousand villagers drawn from scores of villages falling in the submergence zone walked in protest and organised a rally at village Pathri.

The people's uprising against the dam gathered momentum and between March 14 and 25, 1999, a massive protest march by 20000 PAPs and others led to stoppage of work on the dam. This protest march at village Gose not only galvanised the people, but made them realise that they were not alone in their struggle. Leaders from different organisations of PAPs were there to help them, It was during this period only that "Satyagraha" was observed for 10 days by various batches of PAPs.

The February and March rallies fortified the people's resolve against the unjust and unscientific project and in the next stage of the agitation they organised a massive 'mashal' (torch) march at village Ghatumri on April 22,1999.Some 10,000 men and women, old and young alike, literally

It prominently misses out on Theme no. 3 (Culture and Bio-diversity and Sub-Theme no. 6 (Community Conserved Areas), both considered crucial to the NBSAP. It also misses on Theme 10 (Micro- organic bio-diversity). Its coverage of Theme no. 12 (Access, Benefit-sharing and IPRs)), and is also extremely weak. In its coverage of Theme no. 2 (Livelihoods, Lifestyles), it is weak on issues of forest-based tenure and rights (though this is mentioned in a few places), and on tackling unsustainable patterns of consumption of forest produce of the urban elite. It has a limited coverage of Theme no. 4 (Health and Biodiversity).

5. Does the document make recommendations for follow-up, which could become important indicators or directions for the NBSAP process to head towards? (e.g. does the document recommend further studies on Tenure and Biodiversity, or the setting up of an institutional structure which has not yet been implemented, in which case should the NBSAP process focus on these aspects?).

Several of the recommendations of the NFAP need to be followed up, since (as stated above), they are not yet translated into concrete steps for action. In addition, issues such as the integration of biodiversity concerns into all forestry activities, consumptive and non -consumptive use of wild bio diversity, natural resource accounting, forest-based tenure and rights, innovative institutional mechanisms for forest regeneration and conservation, innovative mechanisms for fund-raising, and so on, have been mentioned, but need to be understood and made 'actionable' through follow-up activities. Many of these are within the purview of the NBSAP. The Thematic Working Groups and the State Nodal Agencies will do well to follow up on many of these issues.

6. Would this document in any way contradict other existing action plans, national reviews, etc., a contradiction that the NBSAP process needs to take cognizance of?

In a pluralistic environment where multiple stakeholders make the decision making process complex, the NFAP, as well has it's share of contradictory pulls, e.g. it mentions community based mechanisms and the need to guarantee clear tenure and rights to local communities over forest resources (NFAP Vol. II section 2.17), but at the same time it underscores the role of private sector in managing the forest enterprise (Vol II 2.16).

Many of the recommendations of the NFAP would need considerable changes in the existing forest laws of the country, a point that it itself makes, but does not go into great detail. For instance it's recommendations on wildlife farming (Vol. II Box 2.3) would require legal space in the Wildlife Protection Act. In addition, some of these recommendations (especially on biodiversity conservation and local community tenurial security) would require changes in the institutional structures handling forests, a widespread re-orientation of the existing forest bureaucracy, and changes in policies and laws that govern the extraction and use of resources in forest lands (e.g. mining, industrial siting and raw material use, and so on). Finally, the NFAP does not bring out the relationship of forest activities with the recent panchayat legislation, in particular the Panchayat (Extension to Scheduled Areas) Act 1996, which is critical if rural communities are to be brought squarely into the regeneration, conservation, and management of forests in the country. These are aspects that the NBSAP could profitably go into.

7. Is there any indication of the *process* carried out in making this document, was it consultative, did it take on board all the relevant sectors of society? If there is, are there some obvious major gaps, which the NBSAP process can plug? Or is there no indication of the process at all?

The documents reviewed do not provide detailed documentation of the process followed in getting the NFAP in place, however a brief on the process as listed in the document is put up below:

The NFAP process got under way in the year 1992 - 93 with the formulation of a project document IND/93/021 which was funded by UNDP/FAO and implemented by the MOEF. In nutshell, the process followed in developing NFAP included :

1. Forestry Sector Review : The review was taken up by individual consultants/Consultancy firms for individual States/Union Territories.
2. The State Forestry Action Programme : This was submitted by different State Governments / Union Territories and facilitated by team of Consultants.
3. Consultancy Reports & Contractual Studies : Both International & National Consultants were fielded and a series of review reports and theme specific studies were conducted.
4. Regional Workshops : Regional Workshops were held to finalise State wise draft reports / Action Plans.
5. NFAP Document : The NFAP draft reports were compiled and edited in the firm of NFAP documents in two volumes and an Executive Summary by the Forest Policy Division in the MOEF.

In terms of the adequacy of the process followed, there are not enough details available in the documents so reviewed. The indications are that the project coordinated by the MOEF was helped by a large number of consultants both from with in the country and from abroad (list of some of the consultancy reports has been put up at annex. 1) . Going by the documents (NFAP Executive summary and Vol 1 & II) ,there is little evidence that the process involved a wide range of players on the lines as envisaged in the NBSAP in the actual formulation of the

FOREST COVER AND AGRICULTURAL SUSTAINABILITY : A CASE STUDY OF TWO VILLAGES OF SOUTH KONKAN

Shri. D.G.Phondekar &
Dr. V.S.Phadke

ABSTRACT:

The ill effects of deforestation at the macro and meso levels are well articulated. The micro-level effects, however, have not attracted attention to the extent they deserve. At this level one finds changes in landcover-landuse and agricultural landuse which throw light on reduced availability of water and menace of animal pests. The present paper brings out some of these effects with the help of a case study of two villages from South Konkan.

get full paper

NFAP. However, some of this may have happened at the level of some states, but details of this are not available as yet. If indeed these are major gaps in the *process* by which the NFAP was formulated, then this is a major area of activity for the NBSAP.

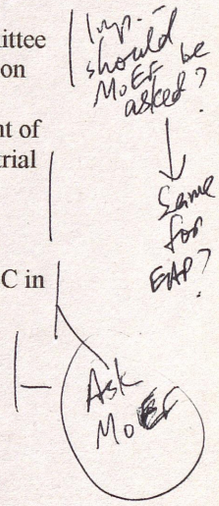
Q: OVERALL, DOES THE DOCUMENT POINT TO WAYS IN WHICH THE NBSAP PROCESS COULD AVOID DUPLICATION, BUILD ON WHAT ALREADY EXISTS, HELP RESOLVE CONTRADICTIONS, AND HOME IN ON MAJOR GAPS?

A closer examination is needed of the NFAP, and of the various state level plans and reviews, to answer this in detail. It appears from the first examination that quite a bit of basic information/data on forests and their status have been compiled, several thematic reviews have been done, broad analysis has been attempted, and at least some state-level action plans have substantial details. These will all be useful beginning points for the NBSAP in its national, thematic, and state level processes.

RECOMMENDATIONS

It is suggested that:

1. The division in the MOEF responsible for the NFAP could be put on board may be on the Steering Committee of the NBSAP to ensure that the linkages between the two processes are built in , the follow up on the action proposals suggested by the NFAP are taken up (where-ever feasible)and the duplications are avoided.
2. A closer examination of the recommendations of the NFAP and its budgeting be carried out, from the point of view of its relevance for NBSAP. This could be done for the whole NFAP by the TWG on Natural Terrestrial Ecosystems, as also for specific relevant parts of the NFAP, by the TWGs on Livelihoods, Domesticated Biodiversity, Economics and Valuation, Policies/Laws/Institutions, Education/Research, and Technology/Industry.
3. State level reviews and action plans carried out as part of the NFAP process, be made available to each SSC in the NBSAP process, to enable them to closely examine these documents for the same purpose.
4. Thematic reviews carried out as part of the NFAP process, be made available to the relevant TWGs of the NBSAP process.



ANNEXURE

NATIONAL CONSULTANCY / CONTRACT STUDIES

1. Forestry in Land Use.
2. Extent, Composition, Density, Growing Stock and Annual Increment of India's Forests.
3. Silviculture and Forest Management
4. Conservation of Forest Eco-systems.
5. Report on Biomass
6. Assessment of NTFP Resources of India.
7. Agro-forestry practices.
8. Pasture and Fodder Management
9. Desertification Control.
10. Forest Seed Technology.
11. Forest Protection.
12. Rural Small Scale Forest-based Industries.
13. Marketing and Pricing of Forest Produce in India.
14. Wood Substitution.
15. Rural Sociology.
16. Women in Forestry.
17. Common Property Resource
18. Forestry Extension.
19. Data Base Management.
20. Software Development and Forest Management.

• the United States Code: 7 U.S.C. Section 1738k(d)(1); Title 22 (9 separate Sections), 42 U.S.C. Section 11701(17) and the United States S. Con. Res. 44, 103d Cong., 1st Sess. (1993)

PRACTICE IN THE COMMISSION ON HUMAN RIGHTS WORKING GROUP ON THE DRAFT DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES

Since the establishment of the Commission on Human Rights Working Group on the Draft Declaration on the Rights of Indigenous Peoples in 1995, the following States have accepted usage of the term Indigenous Peoples: Angola, Argentina, Australia, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Denmark, Ecuador, El Salvador, Estonia, Fiji, Finland, Guatemala, Malaysia, Mexico, New Zealand, Norway, Pakistan, Peru, the Philippines, the Russian Federation, Spain, Sweden, Switzerland and Venezuela.

POPS AND ITS AFFECT ON INDIGENOUS PEOPLES

The widespread proliferation of POPs in the atmosphere and ecosystems presents a particularly critical threat to Indigenous Peoples, whose survival, health and well being depends on their traditional relationships with the land, and the food that comes from the land which has sustained them since time immemorial. Subsistence ways of life such as hunting, fishing, gathering and traditional farming provides the cultural, spiritual, social and economic foundation for Indigenous Peoples throughout the world.

Water and wind currents, and migratory patterns of birds, fish and sea mammals tend to move POPs to the colder regions of the world. Some of the best-documented cases of highly exposed populations are Indigenous peoples living in Polar Regions far distant from most POPs sources. For example, the Inuit living on Baffin Island carry seven times more PCBs in their body than people living in lower latitudes. The Canadian Arctic Contaminants Assessment Report prepared by all eight Arctic nations showed that levels of POPs in some Inuit is ten to twenty times greater than those tested in warmer temperate regions. Residues of POPs, such as PCBs, DDT, and dioxins were found in blood, fat and mother's breast milk.

POPs also pass through the mother's placenta to her unborn child. Research on children and women who regularly eat large amounts of POPs – contaminated fish from Lake Michigan of the Great Lakes of North America resulting from dumping of industrial wastes, found observable and measurable behavioral effects and learning deficits passed on from one generation to the next. The integrity of the next generation, and the generations to come, is under serious threat.

In the United States and Canada, Mohawk Indians are being exposed to industrial emissions such as PCBs through consuming contaminated fish and wildlife, drinking water sources, soil, dermal contact from swimming, and consumption of breast milk by infants. The Mohawk women carry PCBs in their bodies that are passed on to their future generations in the womb and through breast milk.

The Commission of the Convention on the Rights of the Child, article 24, recognizes the right of children to the enjoyment of the highest standard of health and mandates that state parties, "shall pursue full implementation of this right and take appropriate measures to combat disease and malnutrition "taking into consideration the dangers and risks of environmental pollution."