U.N. World Charter for Nature

"Life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients. Civilisation is rooted in nature which has shaped human culture and influenced all artistic and scientific endeavour."

Importance & Values of Forests in Nature & Civilisation

- (WITH POLICY & STGY:)
- Biodiversity
- Ecological Balance – Microclimate, Rains, Global warming reversal..
- Wood
- Wild Life
- NTFP
- Ecotourism

- (ONLY AS BIPRODUCT:)
- Water prcolation, conservation, ground water storage
- Soil building, conservation
- Health security- Medicinal Plants
- Aromatic Plants
- Energy – Biofuel
- Livelihood support
- Agriculture support
- Food Security – Nutrition, variety, emergency.

Medicinal Plants & Forests

- Forests are source/cradle of Medicinal Plants & its genetic diversity.
- Health Security – Medicinal Plants: Ayu, Sidha, Modern.., Folk, Unani, Tibetan.
- Biodiversity – Med plants is microcosm of Biodiv
- Nutrition – Vitamins, Antioxidants
- Potential source of medicines for futuristic deceases
- Industrial Appl- Pharmacaeticals, Nutricaeticals,Cosmecaeticals

BioDiversity Scenario

- World: 272,000 vascular plants
- 1/3 is endemic to India

- 34,000 Spp are threatened(157-AppI, 233 medplnts- App II of CITES list: Com tra in wildtaken specimens of species in banned/with permission of app ii)
- Flora in India: 47,000(11% of world)
- Flowering Plants: 17,500
- Threatened medicinal Plants: 1000
- 233 Spp in CITES agreement list are medicinal appII.
- Endemic & threatened in India:29/70 assesssed.
- RET species in Karnataka: 112
- Threatened spp in Karnataka: 56 out of 70 assessed.
- 28/41 non endemic spp are also threatened.

CONSERVATION FACTORS: USAGE, HARVEST, CULT, EXPO

- No. Plant based Med Plants formulations: 25,000
- No. of Species refered as usable: 6200
- Modern: 204, Ayu:2351, Sidha:1785, Homeo:506, Unani:979, Tibetan:350, Folk:5137
- 80% Populn in deving countries use med plnts No. of spp. Actively used: 1500
- >90% brought from Nature; 70% Destructive harvesting
- No of spp used in Industry~ 800
- Med plants of Comm, large ind, exp, imp~ 405
- No. of spp. Under commercial cultivation:~20
- Exported ~63 spp+formulations;(66% in raw & basic formulations) Imported ~40 spp

Med Plnt Sector: Global Interface – an Opportunity

- Global Market-Phyto pharmacaeticals: $10b; Medical botanicals:$16.5 b(growth 15-20%); Nutracaeticals:$4.05 b ; Cosmeceuticals: 7.5 b$
- Export from India:
- Med Plnt & Prod:45158 T=Rs.993cr(02-3)
- Aromatic Plnts:4309 T=Rs.193Cro
- Imports of India: Med Plnts:Rs11.7 Cr; Aromatic Plant Extracts: Rs 7.7 Cr.
- No of spp: Import-Med plnts: 12(Maj) Aromatic plnts: 21 major Export-medplnts other than prepns:25; Arom:35; exp med plnt prepns: 75.2%

CURRENT SITUATION in Karnataka

- No. of Manufacturers: 248
- No. of Exporters: 36
- No. of Extractors: 12
- No. of significant Traders: 12
- Appx No. of Cultivators: 400

National scenario

- Indian Market of the order of Rs7000 Cr.
- Exports: Rs. 1,275 Cr (2003-04)
- Share in world market <1%
- 70% of export in raw drugs and raw herbs.

Strengths

- Western ghats is one of the 12 Biodiversity hotspots of the World – endowed with good environmental factors for growth of var of med plants
- Rich Agriculture Base with surplus capacity and considerable scope for inter and intra cultivation and lot of cultivable waste land and fallow lands.
- Karnataka Forest Dept is a well spread out organisation with disciplined and technically trained personnel.
- Biotechnology is growing in Karnataka very fast in recent years registering 30% growth in certain areas.
- JFPM institutions offer cooperative synergy for extension, nursery, economy of scale etc.

Weaknesses

- It is in a very primary stage: No/Low Policy, Strategy, Law, Regulations, Infrastructure, Financial investment for Medicinal Plants
- Economy of scale is unfavourable for most medicinal plants.
- Low ‘quality consciousness’ in cultivation, process, preservation, production resulting in contamination, deterioration, adulteration, substitution having impact on low export and local market share.

Opportunities

- Cultivation of medicinal plants can fetch additional income, quality employment, scope for growth of rural economy, optimum utilisation of agriculture infrastructure.
- Export potential lies untapped
- Overall economic growth esp. covering rural areas is possible

Strategy: Threats

- Fear, Ignorance, Dogma, inertia for change.
- Risks of failure and dramatic price fall.
- Monopoly Industries may thwart competetion
- middlemen cashing on secrecy.

Direction

- Incorporation of Medicinal plants in forest pol.
- Law to restrict & regulate raw materials utilisation from forests
- Conservation measures similar to wild life protection
- Cites like agreement between States
- Nationalised trade of endangered species.
- Quality Planting Material- Collection, Storage, Distribution, Nursery.
- R&D – Genetic improvement,Cultivation protocol, Market research
- Plantation: Regular, JFPM, Pvt, degraded
- Initial process at site, Value addition in village

Stgy, Direction Contd….

- Promote cultivation in farmers lands
- Create marketing facility – Information, Web based marketing, provision in SAFAL.
- Pricing- Online price information, breaking monopoly
- Expansion of Industries and export
- Crop Insurance
- Good Agricultural practice & Organic farming
- Good manufacturing practice to raise to global quality
- Subsidise cultivation of threatened species
- Registration of all stakeholders for synergy

BIO TECH SECTOR IN Karnataka

- 183 BioTech Companies are in Karnataka(137 in Bangalore) out of 340 in India
- : Rs.2200Cr in India; Bangalore:Rs.1000 Cr
- 16000 Scientific personnel are employed
- Hubs: Agri- Bio: Dharwar; Nutracaetical Bio: Mysore; Phytopharmacaeticals: Mysore
- Growth rate of export(BioPharma) during 01-06: 29.65% from$2.2bn to $4.81bn
- Ranks 4th in the export of principal commodity
- Bio pharma forms 70% of India's Biotech business
- Turnover of Karnataka: $ 500 m; Export: $250 m Highest in Ind.
- No.of BioTech schools in India: 30; Bangalore: 15.
- Revenue in BioAgri sector:$250m; Growth rate 50%.
- Revenue in Bio Services: $250 m;

NMPB - Promotional Scheme

- 100% Grant. Max: Tech Dev/ Transfer: Rs10L/yr, Problem Solving Rs25 lakh.
- Public Sector instns for R&D; All instns for promotion
- Areas: Conservation – in situ,exsitu, Surveys& Inventory, QPM, Edn & Extention, econ sy & res, R&D, Value addition, Institutionalisation of cooperation.
- Comprehensive Proj proposal with objectives, scheme, likely impact & action plan alongwith Regn, balance sheet of 3 yr, Biodata etc. docs

NMPB - Commercial Scheme

- Subsidy: 30% of proj cost; max: Rs.9lakh.
- Regd grower, Assn, Manufacturer, Pharma Co, NGO, R&D instn, PSUs. 3yr exp.
- Areas: Value Addition, Innovative marketing mechanism, QPM supply, expansion of med plants cultivation.

NMPB Sch: Contractual farming

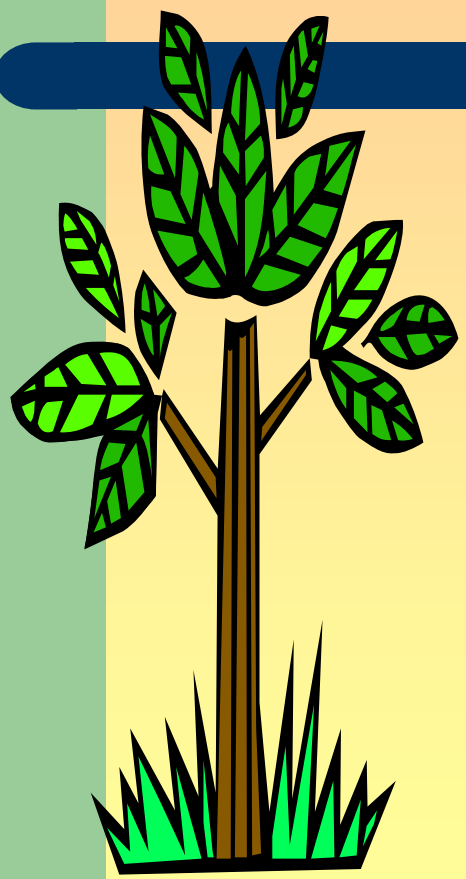
- 30% proj cost as subsidy in 2 instalments Max. Rs. 9 lakhs.

- To grow priority medicinal plant species
- Regd grower, associations, manufacturer, Pharma co, NGO, R&D instn, with 3 yr experience in med plants are qualified.
- Buy back agreement with reputed companies needed.
- Loan from a reputed bank needed.
- Technically, economically, ecologically feasible project proposal of 3 yrs with necy docs

Land availability in Karnataka

- Total geographical area: 19.179 Mha
- Total Forest Area: 4.444 Mha
- Cultivable waste lands: 0.439 Mha (2.3% of geo area)
- Current fallow lands: 1.367 Mha(4.37% in 1960 to 8.77% in 1997)
- Other fallow land: .408 Mha
- Permanent pastures & grazing land: 1.005 Mha
- Degraded forest Area: 0.325 Mha
- Agriculture land:12.284 Mha
- Road length: 1,31,592 kms
- Railways: 2795 kms
- Est. Canal length: 1000 kms

COMMERCIAL SPECIES



- Amla
- Saraca Ashoka
- Ashwagandha
- Shri gandha
- Isabgol
- Kokum
- Guggal
- Kalmegh-Nelabevu
- Madhunashini
- Coleus
- Sarpagandha
- Acorus (Baje)
- Makoy
- Thulasi
- Long Pepper(Pippali)
- Shatavari(Asparagus racemosus)
- Kokum(Garcinia indica)
- Stevia
- Red sandal
- Arjuna(Holemathi)
- Patchouli(Aromatic
- Harda(T chebula)
- Bilva
- Aloevera(Lolesara)
- Eucalyptus citriodora
- Lemon grass
- Safed musli
- Senna(Casia angustifolia)
- Ficus glomerata(Atti)
- Amrita balli(Tinospora cordifolia)

EXPORT POTENTIAL& IMPORT SUBSTITUTION MEDICINAL SPECIES

- Serpentina
- [redacted]
- Aloe vera
- Senna
- Neem
- Nux vomica
- Garcinia cambogia
- Sea weeds
- Sandal
- Euc globulus
- Pachoili
- Cinnamom Clove
- Nutmeg
- Lemongrass
- Agar
- [redacted]Cinnamom camphora)
- Ashoka
- Bore
- Ayurvedic, Unani & Homeo medicine prepns:
- Madhunashini
- Mapia
- Acorus calamus
- Adathoda vasika
- Vina rosea
- Holorrhena antidysentrica

Endangered M species – Karnataka

- Chonemorpha fragrans(Chandra hoovu)
- Drosera indica(Krimi nashini)
- Drosera peltata(Thee hullu)
- Michalia champaca (Sampige)
- Persea macrantha (Gul mavu)
- Rauvolfia serpentina(Sarpa gandha)
- Saraca asoka (Ashoka)
- Nothapodytes nimmoniana(Durvasane mara – Modern med)

Vulnerable M Species - Karnataka

- Adenia hondala (Kempu chendu Balli)
- Aegle marmelos(Bilva)
- Aphanamixis polystachya(Mullu muthuga)
- Aristolochia tagala(Dodda eshwari balli)
- Baliospemum montanum (Naga danti)
- Embelia ribes (Huli meese)
- Garcinia morella (Pon puli)
- Gloriosa superba(Karadi kannina gadde)
- Holostemma ada dodien (Jeevanti)
- Madhuca longifolia(Hippe)
- Madhuca nerifolia (Hole hippe)
- Myristica dactyloides (Kadu Jaikai)
- Operculina turpethum (Deva danti)
- Oroxylum indicum (Boone pale)

Vulnerable M Species – Karnataka – Contd..

- Piper mullesua (Gaja pippali)
- Pseudarthria viscida (Antu bele)
- Raphidophora pertusa(Dodda thippali)
- Santalum album (Gandha)
- Schrebera swietenioides(Gante,Mogalinga)
- Symplocos racemosa (Bala doddali)
- Tinospora sinensis (Sudarshana balli)

Near threatened m Species Karnataka

- Celastrus paniculatus (Kanagili balli, Karigonne)
- Hedychium coronarium(Karppura ver – adulterant also)
- Nervilia aragoana(Padma karini)
- Piper nigrum(kari menasu)
- Smilax zeylanica (Kadu hambu tavare)
- Symplocos cochinchinensis(Boodaganni,Lodhra)
- Terminalia arjuna (Bili mathi, neeru mathi)

THANK YOU

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Addl. Principal Chief Conservator of Forests & C.E.O.,

Karnataka Medicinal Plants Authority.