GLOSSARY

LIST OF TREES, SHRUBS AND CLIMBERS FOUND IN BILASPUR FOREST DIVISION

FAMILY	*BOTANICAL NAME*	LOCAL NAME
ACANTHACEAE	*Achyranthes aspera L.*	Latjira, Aghada, Kutri, Apamarg
ACANTHACEAE	*Adhatoda zeylanica Medikus*	Adusa, Basuti
ACANTHACEAE	*Aechmanthera gossypina (Nees) Nees*	Lathgan
ACANTHACEAE	*Barleria cristata L.*	
ACANTHACEAE	*Dicliptera bupleuroides Nees*	
ACANTHACEAE	*Goldfussia dalhousiana Nees*	
ACANTHACEAE	*Hemigraphis rupestris Heyne ex Anderson*	
ACANTHACEAE	*Justicia simplex D.Don*	
ACANTHACEAE	*Peristrophe paniculata (Forsk.) Brumitt*	
ACANTHACEAE	*Rungia pectinata (L.) Nees*	
AGAVEACEAE	*Agave sisalana*	Kohar Patha
ANACARDIACEAE	*Rhus cotinus L.*	Tung
ANACARDIACEAE	*Rhus parviflora Roxb.,*	Aam
ANACARDIACEAE	*Mangifera indica L.*	Kakar-Singi
ANACARDIACEAE	*Pistacia integerrima Stewart*	Salambra
ANACARDIACEAE	*Lannea coromandelica (Houtt.) Merr.*	Gama
APIACEAE	*Centella asiatica (L.) Urb.*	Brahmi
APOCYNACEAE	*Carissa opaca Stapf ex Haines*	Kero
APOCYNACEAE	*Holarrhena antidysenterica Wall.*	Ghanira :
APOCYNACEAE	*Nerium odorum Sol.*	Kali Dudhali
APOCYNACEAE	*Vallaris heynel Spreng.*	Bakarbel
APOCYNACEAE	*Ichnocarpus frutescens Blanco*	Dudhli
APOCYNACEAE	*Cryptolepis buchanani Roem.et Schult.*	
APOCYNACEAE	*Calotropis procera Ait.*	Aak

AQUIFOLIACEAE	*Ilex dipyrena Wall.*	
ARALIACEAE	*Hedera helix L.*	
ARECACEAE	*Phoenix humilis Royle ex Becc.*	Khajur'
ASCLEPEDIACEAE	*Tylophora hirsuta (Wall.) Wight,*	Terni
Asclepiadaceae	*Calotropis gigentea (L.) R.Br.*	Madar, Aak, Akauwa, Arka
ASPHODELIACEAE	*Aloe- vera L.*	Gwar patha
ASTERACEAE	*Ageratum conyzoides L.*	
ASTERACEAE	*Ageratum houstonianum Miller*	
ASTERACEAE	*Anaphalis busua (Buck. -Ham. ex D. Don) DC.*	
ASTERACEAE	*Artemisia capillaris Thunb.*	
ASTERACEAE	*Artemisia japonica Thunb.*	
ASTERACEAE	*Artemisia vulgaris var. nilagirica C.B. Clarke*	
ASTERACEAE	*Bidens pilosa L.*	
ASTERACEAE	*Bidens bipinnata L.*	
ASTERACEAE	*Blumea hieraciifolia (D. Don) DC.*	
ASTERACEAE	*Blumea laciniata (Roxb.) DC.*	
ASTERACEAE	*Blumea mollis (D. Don)*	
ASTERACEAE	*Cichorium intybus L.*	
ASTERACEAE	*Conyza bonariensis (L.)*	
ASTERACEAE	*Conyza canadensis (L.) Cronquist*	
ASTERACEAE	*Conyza japonica (Thunb.) Less. ex DC.*	
ASTERACEAE	*Conyza leucantha (D. Don) Ludlow & Raven*	
ASTERACEAE	*Cotula anthemoides L.*	
ASTERACEAE	*Elephantopus scaber L.*	
BERBERIDACEAE	*Berberis lycium Royle*	Kasmal
BERBERIDACEAE	*Berberis aristata D.C.*	Kasmal
BIGNONIACEAE	*Stereospermum personatum (Hassk.) Chatterjee*	Padal

BIGNONIACEAE	*Oroxylum indicum (L.) Ventenat*	Tatplanga
BIGNONIACEAE	*Jacranda mimosifolia D. Don*	Chamror
BIGNONIACEAE	*Tecoma stans (L.) Humb.*	
BORAGINACEAE	*Ehretia laevis Roxb.*	lasura
BORAGINACEAE	*Cordia myxa L.*	
BUXACEAE	*Sarcococca saligna (D.Don) Muell.-Arg. in DC.,*	
CACTACEAE	*Opuntia monacantha (Willd.) Haw.*	Chhitaar Thohar
CANNABACEAE	*Celtis australis L.*	I(hirak
CANNABACEAE	*Cannabis sativa (L.)*	Bhang
CAPPARIDACEAE	*Capparis leucophylla DC.*	Barna
CAPPARIDACEAE	*Crataeva religiosa Hook. f. & Thoms*	Sankheran
CAPRIFOLIACEAE	*Viburnum cotnifolium D. Don*	
CAPRIFOLIACEAE	*Viburnum mullaha Buck. -Ham. ex D. Don*	
CAPRIFOLIACEAE	*Leycesteria formosa Wallich*	
CAPRIFOLIACEAE	*Lonicera quinquelocularis Hardwicke*	
CAPRIFOLIACEAE	*Abelia triflora R. Br. ex Wall.*	
CELASTRACEAE	*Euonymus tingens Wallich*	Chilru
CELASTRACEAE	*Celastrus paniculata Willd.*	Bahera
CELASTRACEAE	*Elaeodendron glaucum (Rottb.) Pers.*	Harar
COMBRETACEAE	*Terminalia belerica (Gaertn.) Roxb.*	
COMBRETACEAE	*Terminalia chebula Retz.*	
COMBRETACEAE	*Terminalia arjuna (Roxb.) Wight & Arn.*	Arjuna
COMBRETACEAE	*Terminalia tomentosa Willd.*	Alson
COMBRETACEAE	*Anogeissus latifolia (Roxb. ex DC.) Wall.*	Chhal
COMBRETACEAE	*Terminalia chebula Retz.*	
CONVOLVULACEAE	*Porana paniculata Roxb.*	Massata
CUSCUTACEAE	*Cuscuta reflexa Roxb.*	Akasbel

DIOSCOREACEAE	*Dioscorea pentaphylla L.*	Dregal
DIOSCOREACEAE	*Dioscorea belophylla Voigt ex Haines*	Tarari
DIOSCOREACEAE	*Dioscorea deltoidea Wall.*	Khitha
DIPTEROCARPACEAE	*Shorea robusta Roth.*	Sal
EBENACEAE	*Diospyros montana Roxb.*	Kalichhal
EBENACEAE	*Diospyros cordifolia Roxb.*	Maror phali
ERICACEAE	*Lyonia ovalifolia (Wall.) Drude*	
ERICACEAE	*Rhododendron arboreum Sm.*	Brans
EUPHORBIACEAE	*Euphorbia royleana Boiss.*	Chhoin
EUPHORBIACEAE	*Mallotus philippinensis Muell.*	Kamal
EUPHORBIACEAE	*Sapium insigne (Royle) Benth.:*	Balodhar
EUPHORBIACEAE	*Jatropha curcas L.*	
EUPHORBIACEAE	*Ricinus communis L.*	Arand
FABACEAE	*Indigofera pulchella Roxb.*	Kathie
FABACEAE	*Millettia auriculata Baker ex Brandis*	Slang
FABACEAE	*Ougeinia dalbergioides Benth.*	Sanan
FABACEAE	*Desmodium tiliaefolia (D. Don) Wall.*	
FABACEAE	*Abrus precatorius L.*	Raktan '
FABACEAE	*Erythrina suberosa Roxb.*	Pariara
FABACEAE	*Butea monosperma Kuntze*	Dhak
FABACEAE	*Pueraria tuberosa D.C.*	Slod
FABACEAE	*Dalbergia sissoo L.*	Tahli
FABACEAE	*Caesalpinia bonducella (L.) Fleming*	Mechka
FABACEAE	*Caesalpinia sepiaria L.*	Bara Durghar
FABACEAE	*Cassia fistula L.*	Alis
FABACEAE	*Cassia tora L.*	Ailwan
FABACEAE	*Bauhinia racemosa, Lam.*	Koryale
FABACEAE	*Bauhinia vahlii Wight & Arnott*	Tor

FABACEAE	*Albizzia chinensis (Osbeck) Merrill*	Cheoli
FABACEAE	*Albizia lebbeck (L.) Benth.*	Sirin
FABACEAE	*Albizzia odoratissma*	Karmaru
FABACEAE	*Acacia nilotica (L.) Delile*	Kikar
FABACEAE	*Acacia catechu (L.) Willd., Oliv.*	Khair
FABACEAE	*Acacia leucophloea*	Reur
FABACEAE	*Acacia modesta Wall.*	Phulai
FABACEAE	*Acacia gangeana*	Bagherne
FABACEAE	*Mimosa rubicaulis Lam.*	Durghari
FABACEAE	*Bauhinia variegata L.*	Fuel, Fodder, edible
FAGACEAE	*Quercus leucotrichophora A. Camus*	Ban
FLACOURTIACEAE	*Flacourtia xylosma*	Kangu
HYDRANGEACEAE	*Deutzia corymbosa R. Br. ex G. Don.*	
HYPERICACEAE	*Hypericum cernuum Roxb.*	
JUGLANDACEAE	*Juglans regia L.*	Khor
JUGLANDACEAE	*Engelhardtia colebrookiana Lindl.*	Samma
LAMIACEAE	*Ajuga bracteosa Wallich ex Bentham*	
LAMIACEAE	*Colebrookea oppositifolia*	Doos
LAMIACEAE	*Pogostemon plectranthoides*	Barmera
LAMIACEAE	*Clerodendrum infortunatum L.*	Motia
LAMIACEAE	*Gmelina arborea Roxb.*	Kunubar
LAMIACEAE	*Ocimum sanctum L.*	
LAMIACEAE	*Ocimum sanctum L.*	Tulsi
LAURACEAE	*Machilus duthiei*	Rehan
LAURACEAE	*Litsea glutinosa*	Kang
LILIACEAE	*Asparagus racemosus*	Sansbai
LINACEAE	*Reinwardtia trigyna (Roxb.) Planch. in*	Asant
LYTHRACEAE	*Woodfordia fruiticosa Kurz.*	Dhamin

LYTHRACEAE	*Punica granatum L.*	Daran
MALVACEAE	*Kydia calycina Roxb.*	Poold
MALVACEAE	*Bombax ceiba L.*	Simal
MARTYNIACEAE	*Martynia annua L.*	
MELIACEAE	*Melia azedarach L.*	
MELIACEAE	*Cedrela toona Roxb.*	Derk
MELIACEAE	*Azadirachta indica*	
MELIACEAE	*Melia azedarach L.*	
MELIACEAE	*Azadirachta indica A. Juss.*	Neem, Nimba
MENISPERMACEAE	*Cocculus laurifolius L.*	Neem
MENISPERMACEAE	*Tinospora cordifolia Thunb. Miers*	Paror
MENISPERMACEAE	*Cissampelos pareira L.*	Gulj-Gloe
MENISPERMACEAE	*Tinospora cordifolia (Wilad.) Miers ex Hook. & Thoms.*	Giloy, Ninjara, Guluchu, Gulwali, Gharal
MORACEAE	*Morus serrata Roxb.*	Toot
MORACEAE	*Morus alba L.*	Toot
MORACEAE	*Ficus bengalensis L.*	Bar
MORACEAE	*Ficus religiosa L.*	Pipal
MORACEAE	*Ficus palmata Forsk.*	Dagla
MORACEAE	*Ficus cunia Buch: Ham. ex Roxb.*	
MORACEAE	*Ficus racemosa L.*	Gulliar
MORACEAE	*Ficus rumphii Blume*	Pilkhan
MORACEAE	*Ficus roxburghii Wall.*	Tiamli
MORACEAE	*Ficus benghalensis L.*	Bargad
MORACEAE	*Ficus religiosa L.*	Pipal
MORINGACEAE	*Moringa oleifera Lam.*	Bhatindu
MYRCINACEAE	*Myrsine africana L.*	Rasunna
MYRTACEAE	*Syzygium cumini L.*	Jamnba ''

MYRTACEAE	*Syzygium caryophyatum*	Jaman
MYRtaceae	*Syzygium cumini L.*	Jambool
OLEACEAE	*Jasminum humile L.*	Ban Malti
OLEACEAE	*Nyctanthes arbor-trisitis L.*	Kooii '
OLEACEAE	*Olea cuspidaia Wall.*	Kahu' l
PHYLLANTHACEAE	*Bridelia retusa Spreng.*	Gajh
PHYLLANTHACEAE	*Phyllanthus emblica L.*	Amla
PINACEAE	*Pinus roxburghii Sargent*	chil
PINACEAE	*Pinus longifolia Roxb.*	Kail
PINACEAE	*Cedrus deodara (Roxb.) G. Don*	Kelon(Introduced)
POACEAE	*Dendrocalamus hamiltonii Nees and Arn. ex Murno*	Nal
POACEAE	*Dendrocalamus strictus (Roxb.) Nees*	Banj
POACEAE	*Bambusa arundinacea (Retz.) Willd.*	Magar
POACEAE	*Eriophorum comosum (Wall.) Wall. ex C. B. Clarke*	Ghor Bagar
POACEAE	*Paspalum commutatum Nees*	Bagar
POACEAE	*Erianthus munja (Roxb.) Jesw.*	Surar
POACEAE	*Heteropogon contortus (L.) P.Beauv. ex Roem. & Schult.*	Sariala
POACEAE	*Bothriochloa intermedia (Retz.) S.T. Blake,*	Palman
POACEAE	*Themeda anathera (Nees ex Steud.) Hack.*	Alunji
POACEAE	*Cymbopogon martini (Roxb.) Wats.*	Khawi
POACEAE	*Aristida depressa Retzius*	Ludabaru
POACEAE	*Cynodon dactylon (L.) Pers.*	Grandhi, Durva, Dub, Talla, Khabbal
RANUNCULACEAE	*Clematis gouriana Roxb.*	Chibru
RHAMNACEAE	*Zizphus oenoplia (L.) Mill.*	Ber
RHAMNACEAE	*Ziziphus nummularia (Burm.f.) Wight & Arn.*	Kokla Ber
RHAMNACEAE	*Rhamnus davurica Pallas*	

ROSACEAE	*Prunus cerasoides D. Don. Images*	Paja I
ROSACEAE	*Prinsepia utilis Royle*	Akha
ROSACEAE	*Rubus niveus Thunb.*	Kala Akha
ROSACEAE	*Rubus lasiocarpus Grin.*	
ROSACEAE	*Rosa brunonii*	Kainth
ROSACEAE	*Pyrus pashia Buch.-Ham. ex D. Don.*	Mel
ROSACEAE	*Cotoneaster bacillaris - Wall. ex Lindl.*	Rions
RUBIACEAE	*Rubia manjith Roxb. ex Fleming*	
RUBIACEAE	*Wendlandia heynei (Roem. & Sch.) Sant. & Merch.*	
RUBIACEAE	*Wendlandia exserta (Roxb.) DC.*	Ratela
RUBIACEAE	*Randia dumetorum Lamk.,*	Rara
RUTACEAE	*Zanthoxylum alatum Roxb.*	Tirmir
RUTACEAE	*Feronia limonia (l.) Swingle*	Barnah
RUTACEAE	*Aegle marmelos (L.) Corr.Serr.*	Bil
RUTACEAE	*Murraya koenigii (L.) Sprengle*	Gandhela
RUTACEAE	*Murraya exotlca*	Pipli
RUTACEAE	*Aegle marmelos (L.) Correa*	Beel, Belpatra, Shriphala, Bilwa.
RUTACEAE	*Citrus vulgaris Risso*	
SALICACEAE	*Salix tetrasperma Roxb.*	Beuns
SALICACEAE	*Populus ciliata Wall. ex Royle*	Pharipepal
SAPINDACEAE	*Dodonaea viscosa Jacq.*	mendhu
SAPINDACEAE	*Sapindus mukorossi*	
SAPOTACEAE	*Madhuca longifolia J.F. Macbr.*	Dakanan
SMILACACEAE	*Smilax zeylanica*	
SOLANACEAE	*Solanum verbascifulium*	Mahuva
SOLANACEAE	*Solanum nigrum L.*	Makoi
STERCULIACEAE	*Helicteres isora L.*	Beul
THYMELIACEAE	Daphne papyracea Wall. ex Steud.,	

TILIACEAE	Grewia elastica Royle	Beul
TILIACEAE	*Grewia oppositiftlia*	
VERBENACEAE	*Vitex negundo L.*	Bana
VERBENACEAE	*Lantana camera L.*	Pardessi Butti
VERBENACEAE	*Premna latifolia Roxb.*	Bakar
VERBENACEAE	*Tectona grandis L.*	Vitaceae Sagwan (Introduced
VERBENACEAE	*Vitex nigundo L.*	Nirgundi
VITACEAE	*Vitis semicordata Wall. ex Roxb.*	

LIST OF 100 MEDICINAL PLANTS OF BILASPUR FOREST DIVISION

- *Abrus precatorius* Linn. (Fabaceae) **Fl. & Fr:** August- December
- *Abutilon indicum* (L.) Sweet (Malvaceae) **Fl. & Fr.:** March- May
- *Acacia catechu* (L.f.) Wild. (Mimosaceae) **Fl. & Fr:** May- August
- *Achyranthes aspera* L. (Amaranthaceae) **Fl. & Fr:** July- October
- *Acorus calamus* L. (Acoraceae) **Fl. & Fr:** May-Aug
- *Acalypha ciliata* Forssk. (Euphorbiaceae) **Fl. & Fr:** July- October
- *Adhatoda zeylanica* Medik. (Acanthaceae) **Fl. & Fr:** February- September
- *Aegle marmelos* l. Carr. (Rutaceae) **Fl. & Fr:** April- May
- *Ageratum conyzoides* Linn. (Asteraceae) **Fl. & Fr:** March-October
- *Albizia procera* (Roxb.) Benth. (Mimosaceae) **Fl. & Fr.:**
- *Alternanthera sessilis* R.Br. (Amaranthaceae) **Fl. & Fr:** July- October
- *Alysicarpus monilifer* Linn. (Fabaceae) **Fl. & Fr:** June-September
- *Anogeissus latifolia* Roxb ex D.C.Bedd (Combretaceae) **Fl. & Fr:** May- June
- *Artemisia vulgaris* L. (Asteraceae) **Fl. & Fr:** July- October
- *Asparagus racemosus* Willd. (Asparagaceae) **Fl. & Fr:** September-November
- *Anisomeles indica* (Linn.) Kuntze. (Labiatae) **Fl. & Fr:** August- October
- *Barleria cristata* L. (Acanthaceae) **Fl. & Fr:** July-November
- *Bauhinia variegata* L. (Caesalpiniaceae) **Fl. & Fr:** March-June
- *Bauhinia vahlii* W. & Arn. (Caesalpiniaceae) **Fl. & Fr: March-June**
- *Bacopa monnieri* (L.) Pennell. (Scrophulariaceae) **Fl. & Fr:** March- October
- *Berberis lycium* Royle (Berberidaceae) **Fl. & Fr.:** April- May
- *Boerhavia diffusa* Linn. (Nyctaginaceae) **Fl. & Fr: June – September**
- *Bombax ceiba* L. (Bombacaceae) **Fl. & Fr:** February- April
- *Bridelia verrucosa* Haines (Euphorbiaceae) **Fl. & Fr:** November-April
- *Butea monosperma* (Lam.) Tanbert (Fabaceae) **Fl. & Fr:** March-April
- *Carissa carandus* L. (Apocynaceae) **Fl. & Fr:** April- October

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- *Celastrus spinosa* Royle (Celastraceae) **Fl. & Fr:** March- October
- *Cassia fistula* L. (Leguminaceae) **Fl. & Fr:** May- July.
- *Commelina benghalensis* L. (Commelinaceae) **Fl. & Fr:** July- November
- *Cyperus rotundus* L. (Cyperaceae) **Fl. & Fr:** June- October
- ***Clematis gouriana* Roxb ex D.C. (Ranunculaceae)** Fl. & Fr: **August- October**
- *Cynodon dactylon* (L.) Pers. (Poaceae) Fl. **& Fr:** August- November
- *Cassia tora* L. (Leguminaceae) **Fl. & Fr:** June- October
- *Clerodendrum indicum* (L.) Q.Kuntze (Verbenaceae) **Fl. & Fr:** April- July
- *Corchorus aestuans* L. (Tiliaceae) **Fl. & Fr:** July- September
- *Cryptolepis buchanani* Roem.et Schult (Asclepiadaceae) **Fl. & Fr:** April- November
- *Cleome viscosa* L. (Capparidaceae). **Fl. & Fr:** July- October
- ***Cassia occidentalis* L. (Leguminaceae) Fl. & Fr:** July- October
- ***Corchorus capsularis* Linn (Tiliaceae) Fl. & Fr:** July- September
- ***Calotropis gigantea* (Linn.) R. Br. Ex Ait. Hindi Name: AK Fl. & Fr:** March-June
- *Cannabis sativa* Linn. (Cannabinaceae) *Bhang* **Fl. & Fr.:** March- October
- *Colebrookea oppositifolia* Sm (Lamiaceae) *Pansra* **Fl. & Fr.:** March- May
- *Cocculus laurifolius* DC. (Menispermaceae) Fl. & Fr: March-April
- *Cardiospermum halicacabum* Linn. (Sapindaceae) Fl. & Fr: **August- September**
- *Cordia dichotoma* Forst .f. (Cordiaceae) *Chokargand* **Fl. & Fr.:** June- August,
- *Cissampelos pareira* Linn. (Menispermaceae) Hindi name-. Akanadi **Fl. & Fr.:** May-
- *Cuscuta reflexa* Roxb. (Cuscutaceae) Hindi name-. Akasbel **Fl. & Fr.:** Sept.- March
- ***Desmodium gangeticum* (L.) DC. (Fabaceae) Hindi - Sarivan** Fl. & Fr: **April-**
- ***Desmodium triflorum* (L.) DC. (Leguminosae) Hindi -Kudaliya Fl. & Fr:** August-
- 50. ***Diospyrus montana* Roxb. (Ebenaceae) Hindi -Bistendu** Fl. & Fr: **April- May**
- *Dioscorea bulbifera* Linn.(Dioscoreaceae) Hindi name-Ratalu or Gaithi. **Fl. & Fr:** July-
- ***Dodonaea viscosa* Linn. (Sapindaceae) Hindi name-Sanatha** Fl. & Fr: **March-August**
- *Evolvulus alsinoides* Linn. (Convolvulaceae) Hindi: Sankhapushpi Fl. & Fr: **March-**
- *Eclipta prostrata* **(L.) L.** (Compositae) Hindi name-Bhangra **Fl. & Fr:** July- October
- *Emilia sonchifolia* (L.) DC. (Compositae) Hindi -Hirankhuri **Fl. & Fr:** March- Nov.
- *Euphorbia hirta* L. (Euphorbiaceae) Hindi name-Dudhi or Laldudhi. **Fl. & Fr:** March-

- ***Euphorbia royleana* Boiss. (Euphorbiaceae) Hindi name-Thor** Fl. & Fr: **March-June**
- *Ficus arnotiana* Miq. (Moracae) Hindi name-Paraspipal Fl. & Fr: **April- October**
- ***Ficus religiosa* L. (Moraceae) Hindi: Pipal Fl. & Fr:** March- July
- ***Ficus racemosa* L. (Moraceae) Hindi name-Gular Fl. & Fr:** March-August
- *Flacourtia indica* (Burm.f.) Murr. (Flacourtiaceae) Bilangra Fl. & Fr: **March-May**
- *Fragaria vesca* Linn. (Rosaceae) Hindi Name: Strawberry Fl. & Fr: **May- September**
- ***Gloriosa superba* Linn. (Liliaceae) Hindi name-Kalichari** Fl. & Fr: **August- October**
- ***Hedychium spicatum* Buch.-Ham. ex. Sm. (Zinziberaceae) Hindi -Sitauti**
- *Jatropha curcas* Linn. (Euphorbiaceae) Hindi name-. Bagherenda **Fl. & Fr.:** Throughout
- ***Kydia calycina* Roxb. (Malvaceae) Hindi name- Pula** Fl. & Fr: **July- October**
- ***Kalanchoe spathulata* (Poir) DC. (Crassulaceae) Hindi: Haiza Fl. & Fr:** August-
- ***Lantana camara* Linn. (Verbenaceae) Hindi name- Phullakri or Kurighas.** Fl. & Fr:
- *Leucas lanata* Benth. (Lamiaceae) Hindi -. Goma, Matapati **Fl. & Fr.:** May- October
- ***Limonia acidissima* W. &A. (Rutaceae)** Hindi name: **Beli Fl. & Fr:** April- December
- ***Mallotus philippensis* Muell-Arg.(Euphorbiaceae) Hindi name: Kamala Fl. & Fr:**
- ***Murraya paniculata* (L.) Jack. (Rutaceae) Hindi name: Marchula Fl. & Fr:** March-
- ***Murraya koenigii* Spreng (Rutaceae) Hindi name: GandhelaFl. & Fr:** May- Sep.
- ***Melia azedarach* L. (Meliaceae) Hindi names- Bakain Fl. & Fr:** March- August
- *Machilus odoratissima* Nees (Lauraceae) Hindi: Shawasvalk **Fl. & Fr.:** March- July
- *Moringa oleifera* Linn. (Moringaceae) Hindi name- Soanjna **Fl. & Fr.:** Jan.- June
- ***Nyctanthes arbor-tristis* Linn. (Oleaceae) Hindi name-Harsinghar Fl. & Fr:** May-
- ***Oroxylum indicum* (L.) Vent. (Bignoniaceae) Hindi name-Arlu Fl. & Fr:** May- August
- ***Oxalis corniculata* L. (Oxalidaceae) Hindi name-Amrul Fl. & Fr:** April- October
- *Ocimum canum* Sims. (Lamiaceae) Hindi name. Kala tulsi Fl. **& Fr.:** May- November
- *Olea glandulifera* Wall.ex.DC. (Oleaceae) Hindi name. Gulili **Fl. & Fr.:** April- June
- *Ougenia oojeinensis* (Roxb.) Hochr. (Fabaceae) H. Sandan **Fl. & Fr.:** February- April
- *Phoenix sylvestris* Roxb. (Arecaceae)-Hindi name. Khajur **Fl. & Fr.:** April-June.
- *Polygala arvensis* Willd. (Polygalaceae) Hindi name- Meradu **Fl. & Fr.:** April- August
- *Pouzolzia zeylanica* (L.) Benn. (Urticaceae) Hindi name-Kalluruki **Fl. & Fr.:** July- Oct.
- *Phyla nodiflora* (L.) Greene (Verbenaceae) Hindi name-Bhui-okra **Fl. & Fr:** April-

➢ ***Phyllanthus fraternus*** **Webster (Euphorbiaceae) Hindi: Bhumiamlaki Fl. & Fr:**
➢ 88. *Phyllanthus virgatus* Frost.f. (Euphorbiaceae) Hindi -Kanocha. **Fl. & Fr.:** July- Oct
➢ *Phyllanthus urinaria* Linn. (Euphorbiaceae) Hindi -Hazarmani **Fl. & Fr:** July- October
➢ *Plantago major* L. (Plantaginaceae) Hindi name-Lahuriya **Fl. & Fr:** April- October
➢ ***Pistacia chinensis*** Bunge.ex.Integerrima (Stewart) Rech.f. **(Anacardiaceae)**
➢ ***Punica granatum*** **L. (Puniaceae) Hindi name: Anar Fl. & Fr:** April- September
➢ ***Premna latifolia*** **Roxb. (Verbenaceae) Hindi name-Bakar**
➢ *Randia dumetorum* (Retz) Poir.in.Lam. (Rubiaceae) Hindi -Mainphal **Fl. & Fr:** June-
➢ *Ricinus communis* Linn.(Euphorbiaceae) Hindi name-Arand **Fl. & Fr:** October-April
➢ *Rhamnus virgatus* Roxb. (Rhamnaceae) Hindi name: Chadua **Fl. & Fr.:** May- Aug
➢ *Rhus parviflora* Roxb. (Anacardiaceae) Hindi name: Tung, Raitung **Fl. & Fr.:** May- June
➢ *Rubia cordifolia* Linn. (Rubiaceae) Hindi name: Manjit **Fl. & Fr.:** July- November
➢ *Sapindus mukorossii* Gaertn. (Sapindaceae) Hindi: Ritha Fl. **& Fr.:** April- September
➢ ***Sapium insigne*** **(Royle)** Benth. ex Hook.f **(Euphorbiaceae) Hindi name –Vilayati**

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PART – I

SUMMARY OF FACTS ON WHICH THE PROPOSALS ARE BASED

CHAPTER-I

THE TRACK DEALT WITH

1.1 **Name and Situation: -** This working plan deals with all the Reserved, Demarcated Protected and important Protected Forests of Bilaspur Forest Division. The Division covers the whole of the Bilaspur District with a geographical area of 1167 sq.km as per survey of India record and 1155 sq.km as per revenue record. The river Sutlej which forms the Govind Sagar reservoir runs almost through the middle of this Division from North east to South west with a large bend in the centre. Ghamber Khad joins it from the South and Sir Khad from the North.

1.1.1 The tract with which this working plan deals is situated between 76-23-45 to 76-55-40 longitude and 31-12-30 to 31-35-30 North latitude. It is bounded on the north by Hamirpur and Mandi Districts, on the east and south by Solan District and on the west by Una District and Rupnagar District of Punjab State. The Forest area forms part of the catchment of Sutlej river and Gobind Sagar reservoir.

1.1.2 The forests do not form a continuous and compact belt but are scattered throughout the division occupying mostly steep hill sides generally not fit for cultivation

1.1.3 This Division consists of six Ranges viz. Sadar, Swarghat, Kalol, Jhandutta, Ghumarwin and Bharari. Swarghat and Sadar with head quarters at Swarghat and Bilaspur respectively, comprising forest areas on the left bank of Sutlej and Ghumarwin, Jhandutta, Bharari and Kalol with head quarters at Ghumarwin, Jhandutta, Bharari and Kalol comprising areas on the right bank of Sutlej river.

1.1.4 The boundaries of the Bilaspur Forest Division are Co-terminus with the boundaries of Bilaspur Civil District. The headquarters of Division and District are located at Bilaspur which lies on the Chandigarh, Mandi, Manali National Highway No. 21.

1.2 **Configuration of the ground:-** The entire tract is more or less hilly with distinct hill ranges running from south to north, more or less parallel to each other. The hill ranges enter the district from the south-east as irregular high hills with narrow valleys and flatten out as low hills with broad valleys in the north. Almost all the forests are situated on the slopes of these ranges.

1.2.1 The altitude of the tract varies from 300 meters along the western boundary adjoining Punjab State to about 1900 meters along the boundary of Solan District on the east. The configuration of the ground varies from almost flat table land in Ghumarwin, Jhukhala and Berthin valleys to steep and precipitous slopes of the main ranges. The two outer hill ranges have their southern and eastern slopes very precipitous and western slopes comparatively less precipitous. Whereas the central range has western slopes steeper and more precipitous than the eastern slopes.

1.2.2 The tract comprises of seven well known hill ranges, generally referred to as the seven dhars as under:-

i) **Naina Devi:-** It is the outermost hill range bordering Punjab State and derives its name from the famous temple of Shri Naina Devi Ji which is situated on it. This range enters the District at Swarghat as a continuation of the main Nalagarh outer hill range. It runs in western direction for the first 8 kms and then takes the north western direction emerging out of the district at famous Bhakra Gorge. Beyond Bhakra this range is known as "Ramgharh Dhar". The highest point on this range is "Tiuni Ka Tibba" to the west of Mundkhar Fort and is 1332 meter above m.s.i. The elevation decreases as the dhar traverses towards north west. The temple of Shri Naina Devi Ji is situated at an elevation of 180 meters and about 11 kms from Anandpur Sahib. The dhar starts from the very fertile alluvial broad valley of the Sutlej on the west with bare, rugged, broken ravine lands forming small parallel ridges for a distance of about 6 kms. Thereafter, it rises abruptly. On eastern side, it again drops down abruptly into the Sutlej valley forming another parallel ridge at its foot along the river bank for half its length towards the north. The slopes on the eastern side are steeper and precipitous than those on the western side.

ii) **Kot:** It is a branch of 'Naina Devi Dhar' and has been cut off from it by the river Sutlej at a point called Bagphal. It runs straight from south to north and passes out of the district at village Naghiar. Thereafter it is known as 'Sola Singhi'-sixteen horned in Hamirpur district. The highest point on this dhar is Kakrer which is located at the southern most end and is 1148 meters above m.s.I. North-wards this dhar decreases gradually in altitude till it is 909 meters and at this point it passes out of the district. The dhar is narrow, precipitous and almost forms inaccessible ridge near Bagphal in the south but broadens as it traverses towards north. The eastern slopes near the top are precipitous but flatten out as they approach the valleys of Sir and Sarhali Khads. The western slopes are steep near the top but lower down they flatten out as they reach the valley of the river. The forts of Baseh and Bachhretu are situated on this dhar.

iii & iv) **Jhanjiar and Rattanpur:** Though named differently but in reality it is only one continuous range. It enters Bilaspur near the Rattangarh Fort from Nalagarh as a continuation of 'Malaun dhar' where the famous Gorkha battle of 1815 was fought and after traversing for about 15 kms in the north western direction meets the Sutlej River near Ghaniri Forest. This portion is called 'Dhar Rattanpur'. It continues on the other side of the river towards the north where it is known as 'Dhar Badol'. After forming a sort of plateau at Samoh, it meets Sir Khad and then passing through Badhaghat, Jhanjiar and Chowkhra enters Hamirpur District near Paniala across Makan Khad where it is called 'Dhar Samtana' which is again a continuation of Jakh Dhar. This portion of the range is called 'Dhar Jhanjiar'. The western aspect of this dhar is steeper and more precipitous than the eastern slopes. The highest point on this range is Rattanpur situated at its southern end. It is 1223 meters high. The other high point of 1090 meters is in village Jhanjiar on the northern portion. The slopes of this dhar especially the eastern slopes are comparatively easier. The valleys on both sides of this dhar and in the north of Sutlej river are very wide.

v) **Tiun:** It is situated to the north of river Sutlej and runs north south. As a matter of fact these are two ranges called 'Tiun' and 'Sariun' and start from the river from southern side near Malyawar and flatten out into the valleys of Sir Khad towards Kuthera in the north. The highest point on this range is 1364 meters at Sariun Fort. On the Tiun branch the highest point is 1235 meters at Tiun Fort. These ranges are more or less local and not a continuation of any range from outside. The slopes on the whole are steep and precipitous near the top parts.

vi) **Bandla:** This is an off shoot of 'Bahadurpur Dhar' and becomes a distinct range from Brahampukhar onwards. Running from south to North, it passes through east of Bilaspur town and crosses Ali Khad at Ghagas. Continuing on the other side of Ali Khad, it ends at Dehar. This dhar is very massive and broad at the top. Both sides are steep and precipitous. The highest point on this dhar is village Bandla at 1394 meters elevation.

vii) **Bhadurpur:** It is a continuation of dhar 'Bari' in Arki (Solan District) and enters the district at Bahadurpur after which it descends down and terminates into Ali Khad. The highest point on it is 1933 meters Bahadurpur Peak, which is the highest point of the Bilaspur District also.

viii) **Other Minor Dhars And Their Off Shoots:-**

a) **Gochar:-** It is a minor ridge running parallel to Dharkot from Balghar to Deot Sidh. The highest point on it is 810 meters in Gochar Forest.

b) **Sangan:-** It is the continuation of a range from Arki (Solan District) and enters the distyrict at Khatpaul runs towards north and terminates at the river side near Jamthal. There are other off shoots from it like Panjgain, Solag, Jurasi and Digthali dhars but they are very irregular and have no particular direction. The highest points on these ranges are Khatpaul 1971 meters, Cheran 1215 meters and Solag Jurasi 1152 meters.

1.3 GEOLOGY, ROCK AND SOIL:- Main Geological Formations exposed in the Bilaspur Forest Division are the Territories and the quaternary rocks and the Pre-Tertiary rocks. The former cover by far the major part of the district where as the latter are exposed in the eastern part of the district. The following is the Geological sequence:

	Recent & Sub Recent		Terrace deposits of sand boulders and clays; modern river gravels
Tertiary	Siwalik	Middle	Mainly sand stones & clays; boulders beds on top.
		Lower	Hard sand stones and reddish purple or concretionary clays, clay slates.
	Kasaulis		Greenish micaceous sand stones, and greenish or orange clays, clay slates.
	Dagshais		Massive greenish to greyish hard sand stones, dark red and purple coloured clays and shales.
	Subathus		Oily looking green and maroon splintery shales with carbonaceous shales nummulitic limestone.
Permo-Carboniferous	Calcareous series. (Shalisd)		Cherty, Pink, greyish or purple limestone and dolomite, shales, slates and calciphyres.
	Quartizite series (Khaira)		Pink, pale pink quartizites with ripple marks, inter- bedded red grity shales.

Shali Series: (Permo Carboniferous):- The older rocks are seen exposed just east of the town of Bilaspur, forming a high hil known as "Bandla Ki Dhar". Here it is mostly composed of certy limestone, calcareous quartzites and lie over the Dagshai's or Siwaliks with a thrust plane. The "Chhabia wan-Ki-Dhar is mostly composed of soft to hard pink quartizites, calcareous quartizites and pinkish limestones. A number of beds of hard dolomites are exposed along the Sutlej Valley at Dehar. The rocks are highly folded. The folds have no specific alignment and its direction varies from place to place.

Tertiary: The territories comprise the Subathus, Dagshais, Kasaulis and Siwaliks and consists mostly sandstones, Shales and clays, and are distinguished from the older (Pre-

Tertiary Formations) by the absence of any appreciable metamorphism. The two formations are in thrust contact where by the older formation has come to lie over the

younger rocks of Dagshais or Siwaliks. The 'Great Boundary Fault' (fracture of strata as a result of stresses and strains within the earth crust, along the line of which displacement of rocks had occurred) lies just east of Bilaspur town and runs roughly in North / North-Western direction.

Subathus:- These consists mostly of olive green, oily looking splintery shales, some khaki coloured quartzites and nummulitic limestone. These are exposed as thin bands, on the anticlinal ridges formed by the Dagshais, Carbonaceous shales are dometimes seen among the Subathu shales.

Dagshais: Overlying the Subathus are the Dagshais, which consist of alternations of purple and dark coloured cindery and sandy shales, and purple and dark coloured sandstones. The sandstones are hard, compact and at times quartzitic. When they are grayish or light purple in colour. These are also current bedded and ripple marked. The Daghshais cover a vast area and show intense degree of folding in all directions. They have thrust contact with the members of Krol series and are seen overlain by dolomites or calcareous quarzites. These are seen as window series in the Valley of Ali Khad and Panjgain Khala. The highest peak of the district at Bahadurpur Fort is formed of Dagshai and Kasauli rocks.

Kasaulis:- The Dagshais pass into Kasaulis which are made up mainly of greenish to yellowish green sandstone and some clays and shales. The sandstones are micaceous, soft to hard and highly jointed. Clay slates are also met with amonth the sandstone.

Lower Siwaliks:- The lower Siwaliks pass into the middle Siwalik rocks, and some times it becomes very difficult to distinguish one rock from the other. The sandstones are soft to hard and less jointed. These are usually brownish in colour but grayish types are also common. As a rule, the sandstones are finegrained but medium to coarse grained varities also occur. The clays are soft and less concretionary in contrast to the lower siwalik clays.

Upper Siwaliks:- These consist of grayish sandstones, sand, pebble and boulder beds. The sandstones are highly jointed and are usually medium to coarse grained and occupy the lower horizons where the boulder beds occupy the upper ones.

Newer Alluvium: The present day deposits of sand, gravel and boulders along the river valley and stream and khad sections are included in this category. Among the boulders can be seen the rocks of all systems ranging from the Cambrian quartzites to indurated Siwalik sandstones.

1.4 Soils: On the basis of soil survey, the soils of Bilaspur district are broadly divided into following zones:

i) Low hill soil zone:- These soils are found upto an altitude of about 3000' (1000 m). They are sandy loam to loam in texture and light grey to brown in colour, not very deep; embedded with pebbles; stones and boulders mostly situated in the narrow valleys on the banks of rivers or streams; and well drained. The soil reaction is mostly neutral. The carbon nitrogen ration is around 10:1.

ii) Mid hill soil zone:- These soils are found at an altitude of 3000' to 5000' (1000 to 1500 m) mostly situated on the hilly slopes, and varying much in gradient. The soil texture is medium fine, varying from loam to silt loam. The colour is greenish to brown. The depth varies considerably from plain to plain. They have varying percentage of pebbles and stores which have an adverse influence on the fertility status. They are well drained and susceptible to severe drought effects. The carbon nitrogen ration widens, as compared to the low hill soils. The soil reaction is neutral to slightly acidic.

iii) High hill soil zone:- This type of soil is found above 5000' (1500 m) altitude. They are mostly situated on steep slopes and are of fine texture, varying from silt loam to clay loam and are light to dark brown. They are often quite deep. They have good drainage and fertility status is also quite high. The carbon nitrogen ration widens further and shows slower decomposition activities. The soil reaction shows a distinct trend towards greater acidity.

1.4.1 Sandstone dominates the geology of the area. As would be expected, the resultant soil is generally sandy, especially to the west of the Bilaspur Town. Its depth varies inversely with the slope. On ridges and spurs, on precipitous slopes and southernly aspects, the soil tends to shallow and dry with numerous out-crops of bare rocks. At many places especially the higher portions, having calcareous quartzites of cherty limestones, there is no true soil at all but only a weathered product of the parent rock.

1.4.2 The humus content of the soil is also poor especially in the vicinity of villages owing to year round heavy grazing continuous removal of leaf litter for manure and general destruction of the plant cover. Sheet and gulley erosion is very common in heavily grazed areas of outer shiwaliks. Land slips and slides are also met with along the roads and seasonal nallahs.

1.5 Climate: The climate is generally sub-tropical but changes into temperate in a few places on the tops of upper hill ranges such as Bahadurpur, Khatpaul, Bandla and Seriun. Summers are generally hot and winters cold. The winters last from October to

February and are characterized by heavy frost in the lower hills and valleys and a light snowfall during January and February at high reaches. Instances are also known when light snowfall has occurred on lower hills like Bandla and Seriun. During January 1945 the snowfall occurred extensively all over the district down to 490 m. In the district the snowfall often occurred at Bahadurpur. The detail of temperature and humidity in respect of Bilaspur district w.e.f. 1994 to 2010 is given below:

DETAIL OF TEMPRATURE AND HUMIDITY

Year	Temp. & humidity	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Octo.	Nov.	Dec.
1994	Max.	22.8	23.4	31.8	33.3	38.9	40.1	34.0	32.7	32.6	31.1	26.8	26.9
	Min.	0.6	2.5	5.0	7.8	11.1	18.0	21.3	19.1	12.8	7.8	5.3	0.6
	Humidity	88	89	73	72	63	67	88	94	91	84	91	94
1995	Max.	21.0	25.0	NA	34.8	39.4	41.5	35.0	37.1	32.4	39.6	27.4	22.5
	Min.	0.6	0.8	NA	7.3	13.3	16.1	20.2	19.7	15.3	8.3	2.9	1.0
	Humidity	89	92	NA	74	64	66	92	85	91	83	86	59
1996	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1997	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1998	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1999	Max.	22.3	27.2	34.3	38.7	39.4	36.4	33.0	31.5	31.9	30.9	29.5	24.2
	Min.	0.4	1.9	5.9	9.1	10.2	13.7	18.1	17.1	17.1	8.6	3.1	0.1
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2001	Max.	23.7	29.2	30.8	35.2	39.6	35.4	34.5	33.8	32.9	31.9	26.6	23.6
	Min.	0.5	0.5	3.0	7.9	13.6	15.4	19.7	18.1	12.7	8.7	2.6	0.3
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2002	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2003	Max.	20.5	24.1	30.0	36.6	40.5	42.3	35.3	35.6	39.2	30.7	28.7	24.4
	Min.	2.5	9.0	12.6	16.1	20.5	22.6	22.6	23.2	21.8	14.1	17.3	NA

	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2004	Max.	23.9	24.3	34.7	39.7	43.4	39.6	38.3	35.2	36.1	32.1	27.9	24.6
	Min.	6.0	9.0	15.9	20.7	19.4	19.7	22.1	22.4	22.3	17.5	13	10.0
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2005	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2006	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2007	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2009	Max.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Min.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2010	Max.	21.2	22.0	31.3	34.9	36.0	33.7	33.3	30.5	29.8	29.4	25.6	20.1
	Min.	2.2	5.5	11.0	14.6	17.9	18.4	21.5	22.2	19.1	12.6	6.9	1.2
	Humidity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

(Source: DFO office record Bilaspur)

1.5.1 The valleys and the Gobind Sagar lake become full of dense fog during January-February and the fog sometimes persists even up-to, mid day at Bilaspur. A cold night breeze also blows down the Sutlej Valley at certain places during the small hours of the morning. 1.5.2 Summers start from March onwards and last up to middle of the June. The weather is hot and humid. This is also the period of severe drought. The days in the month of May and June are very hot and dry with temperature rising over 44 degree Celsius. Occasional thunderstorms break the dry spell. Growth period also starts from the beginning of this season. The temperature during winter comes down to less than 2 degree Celsius.

1.6 Rain Fall: Rain fall in this Division varies from 310.1 mm to 2191.7 mm, 70% of which is received during the monsoons which last from end of June to mid September. The average annual rain-fall for the division for the period 1995 to 2010 works out to be 1164.2 mm. The rainfall data is given in table 1.1.

A	NA
.9	24.6	
	10.0
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
A	NA
5.6	20.1
.9	1.2
A	NA

January-
cold night
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June. The
ays in the
44 degree
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n, 70% of
September.
s out to be

Table 1.1

RAINFALL DATA BILASPUR DISTRICT (M.M.)

Year	Rainfall in mm
1995	1491.9
1996	2051.6
1997	1940.3
1998	2191.7
1999	1399.7
2000	1069.1
2001	834.5
2002	976.1
2003	1192.1
2004	802.1
2005	848.6
2006	1139
2007	310.1
2008	601.2
2009	888.5
2010	890

1.7 Water Supply:- Sutlej is the only snow fed river of this division, which enters the Division near village Kasal in the North-eastern direction and after flowing over a distance of 89.6 kms. It leaves the Division near village Nehla in the South western direction. Due to the construction of Bhakra Dam, almost the entire course of river falling in Bilaspur Forest Division now forms the Gobind Sagar Lake. The area situated up to 525 m altitude along the banks of river has been acquired by the Bhakra Beas Management Board. The lake area is about 20 kms². The water level in the lake starts rising from May onwards due to increased inflow of water and the maximum level 510 m is attained during Septmeber – October. The water starts receding from mid October onwards till April when the lowest level of 440m is attained and the river starts flowing down Jagatkhana which is the lower limit of dead storage. The lake water, however is not available for irrigation purposes because lifting of water is not permitted by the Bhakra Beas Management Board. The river is crossable at Slapper and Kandrour by cement concrete bridges. The bridge at Kandrour is 87 m in height and happens to be the highest bridge in Asia. The river is also crossable by boat at a number of places and regular ferry service is available. The important routes are as under:-

i) Bilaspur to Bhakra, Jagat Khana, Kandrour, Rishi Kesh, Dehar.

ii) Ghamber Khad to Jagat Khana.

iii) Brahmini Kalan to Bhakra

iv) Kunger Hatti to Khairian

v) Karot to Kanfara etc.

1.7.1 The principal tributaries of Sutlej river are Ghamber, Ghambrola and Ali along the left bank and Sir with its tributaries Sukar and Sarhali along the right bank. All these streams are perennial and are crossable by bridges at Ghamber, Ghambrola, Ghaggas, Ghumarwin, Berthin and Mandwan respectively. Water starts accumulating in their low reaches during high level of lake. Some lift irrigation schemes from these Khads have been put under operation, many others are under consideration. Water from Ali Khad is also used for irrigation of some lands along its bank. Other subsidiary streams are generally dry except during the rainy season when these become raging torrents causing much erosion and carrying with them heavy detritus.

1.7.2 The rainfall is not very heavy and there is scarcity of water in the area. The situation use to become acute during the months of May and June when even drinking water in most of the places had to be carried out from long distances. The situation has been eased to a great extent with the installation of piped water supply and deep bored hand pumps.

1.8 Distribution of Area:- Bilaspur Forest Division comprises of six ranges namely Sadar, Swarghat, Ghumarwin, Bharari, Kalol and Jhandutta having Demarcated Protected Forests only. The forest areas generally scattered and do not form continuous belt. The area dealt with the Working Plan is given below in Table No. 1.2 according to legal classifications Range wise. Compact blocks have been formed either by grouping settlement blocks or

Table – 1.2

Area Statement

Range	Area in hectares			
	Reserve Forests	Demarcated Protected Forests	Un demarcated Protected Forests	Total
Swarghat	0 -	745.18	8420.92	9166.10
Sadar	89.60	2747.79	2242.94	5080.33
Bharari	0	1136.58	272.28	1408.86
Ghumarwin	0	2259.49	531.06	2790.55

Bandhitra	0	2908.79	216.47	3125.26
Kahol	0	3321.25	1826.09	5147.34
G Total	**89.6**	**13119.08**	**13509.76**	**26718.44**

2.8.1 The demarcated forests form continuous blocks of fair size in Kot-Kehloor, Baseh, Bacchretu, Seriun and along the eastern part of Jhanjiar Dhar. Elsewhere, they occur scattered all over and inter spersed by cultivated lands and large areas of Undemarcated Protected Forests in-between.

2.8.2 The area under forests as per forest records is as under:-

Sr. No.	Classification of Forest	Bilaspur Forest Division (Area in hectares)	Naina Devi Sanctuary (Area in hectares)	Total (Area in hectares)
i.	Reserve Forests	89.60	--	89.60
ii.	Demarcated Protected Forests	13251.07	2417.45	15668.52
iii.	Un demarcated Protected Forests taken in regular management	11359.24	7191.52	18550.76
iv.	Un demarcated Protected Forests not taken in regular management	1604.17	0	1604.17
	Total	26304.08	9608.97	35913.05

2.8.3 The area under forest as per revenue record is 14,013 hectares only. Thus, there is a great variation in the two records which needs reconciliation. The land use as per revenue record is as under:-

Sr. No.	Particulars	Area (in ha.)	Remarks
i.	Under Forests	14013	
ii.	Land not available for Agriculture	15845	
iii.	Non agri land other than fallow lands.	6061	
iv.	Fallow lands	964	
v.	Land under agricultural crops	56901	
	Total:	93784	

From the above it is clear that correct revenue entries have not been made of forests as per legal classification which should be done.

1.9 State of Boundaries:- Though the demarcation of the forests was started in the Bilaspur State as early as 1889, the work was never carried out in right earnest for lack of set policy. The boundaries of the forests continued to be changed from time to time. The condition of boundary pillars by and large not in a good state due to lack of repairs. The boundary pillar registers are maintained.

1.9.1 The whole of the Division is covered by the following Survey Sheets of 1:15000 scale.

53 A/7 – NE	53 A/10 - SW
53 A/7 - SE	53 A/10 – SE
53 A/11 – NW	53 A/12 – NW
53 A/11 – SW	53 A/12 – NE
53 A/11 – NE	53 A/14 – SW
53 A/11 – SE	53 A/15 – NW
53 A/11 – NW	53 A/15 – NE
53 A/16 – NE	53 A/15 – SW
	53 A/15 – SE

1.9.2 The forest survey operations were carried out during 1983-84 and survey sheets on 1:15000 scale prepared. These survey sheets do not depict all the DPFs and UPFs. Since settlement of UPFs is going on in which parts of UPFs are being declared as DPFs. Thus this Working Plan is based on the old maps prepared during the Working Plan under revision and also the revenue maps have been reduced to 1:15000 scale. Major physical features like ridges and nallas have been marked on these maps and stocking of forest crop has been depicted.

1.9.3 The kacha boundary pillars in most of the DPFs have been constructed except Bahadurpur RF and Jamthal, Chamyon, Basyans and Kasal DPF where pacca boundary pillars have been constructed. Their size is 1m x 1m at the base and 30 cm x 30 cm to 60cm x 60 cm at the top. The height of the boundary pillars is about 1 meter. These boundary pillars have been marked on the maps and serially numbered. The details of boundary pillars and perimeter of each forest is given in appendix A. The boundary registers in respect of eacg Range have been maintained.

1.9.4 Encroachments: There are 68 Nos. of encroachment cases under trial in the court of Collector-cum-D.F.O. Bilaspur under Himachal Pradesh Public Premises and Land

(Eviction and Rent Recovery) Act, 1971. In addition to above, FIR has been lodged in the cases involving an area of more than 10 bighas as per the directions contained in the judgement passed by Hon'ble HP High Court in Cr. MP NO. 1299/2008, in 8 Nos. of cases consisting of an area of 11.81.25 hectares.The detail list of the cases are given in Table below:-

List of cases which land encroached above 10 Bighas and FIR lodged with Police in respect of Bilaspur Forest Division.

Sr.No.	Name of Encroacher	Name of area encroached	Area in Bighas	Area in Hac.	Khasra No.	FIR No.	Police Station	Name of Range
1	Ram Parkash S/O Sukh Ram V/P.O. Jhabola Tehsil Jhandutta Distt. Bilaspur H.P.	Charand jagal Dehati Jhabola (UPF)	10.13	0.8014	2089/1953/1152/1	59/2011 dated 18.6.2011	Talai	Jhandutta
2	Ramesh S/O Mansha Ram V/II. Sarak Johar PO Malroan Tehsil Jhandutta, Distt. Bilaspur, H.P.	Sarak Johar	18.06	1.44	194,195,196,197	62/2011 Dated 20.6.2011	Talai	Kalol
3	Balwant (Died) S/O Sh Tulsi and Kashmiri Devi w/o Balwant V/II. Sarak Johar P.O. Malroan Tehsil Jhandutta, Distt. Bilaspur H.P.	Sarak Johar	14.13	1.13	157,153,154	63/2011 dated 20.6.2011	Talai	Kalol
4	Sh Tusi Ram /Hariman S/O late Tulsi Ram R/O Deol Chhamb, P.O. Harnoda Tehsil Sadar Distt. Bilaspur.	DPF Jhamthal	13.13	1.0287	80,81,82,83,84,	109/2011 dated 17.6.2011	Barmana	Sadar

5	Lala Ram S/O Banshi Ram R/O Vill. Deola Chhamb , P.O. Harnoda Tehsil Sadar, Distt. Bilaspur, HP.	DPF Jhamthal	10.13	0.8014	87,88.89,90	118/2011 dated 17.6.2011	Barmana	Sadar
6	Sh. KP. Sharma Mangaer JPC Udyog Bagha Distt. Solaan, H.P.	UF Dhar Taatoh	66.17	5.0307	2013/1/2,1949/1, 2013/2,1949/2/2, 2010,2008,1,2013/4, 2013/3,2013/5,2014/1,2016/1, 2017,2013/1/1, 1949/2/1,	108/2011 dated 17.6.2011	Barmana	Sadar
7	Nuratu Ram S/O Bobra Ram R/O Vill. Thach Tehsil Sadar Distt. Bilaspur.H. P.	UPF Thach	10.0	0.7525	11/1,11/2	194/2011 dated 28.9.2011.	Barmana	Sadar
8	Chuni Lal S/o Gorkhu Ram R/O Dhar Tatoh Tehsil Sadar , Distt, Bilaspur, H.P.	UPF Dhar Tatoh	11.0	08278	2279/2219/2134/1, 2279/2219/2134/2	195/2011 dated 28.9.2011	Barmana	Sadar

List of Encroachment cases under trail in the court of Collector –cum- DFO. Bilaspur:

Sr. No.	Description of Case	Area in hac.	Name of Range
1	Case No. 3 Jh/ 2006-07: State V/S Dhyan Singh	0.3876	Jhandutta
2	Case No. 2 Jh/ 2008-09: State V/S Rakesh Kumar	0.0489	-do-
3	Case No. 1 Jh/ 2008-09: State V/S Kuldeep Singh	0.0904	-do-
4	Case No. 1KL/ 2008-09: State V/S Bhag Chand	0.0090	Kalol
5	Case No. 1KL/ 2009-10: State V/S Brahma Nand	1.3674	-do-
6	Case No. 2KL/ 2009-10: State V/S Onkar Singh	0.0291	-do-
7	Case No. 1GH/ 2009-10: State V/S Atma Ram	0.0452	Ghumarwin
8	Case No. 1Bh/ 2010-11: State V/S Krishan Chand	0.0038	Bharari
9	Case No. 2Bh/ 2010-11: State V/S Dharam Singh & others	0.0188	Ghumarwin

10	Case No. 1Gh/ 2010-11: State V/S Parkash Chand	0.0038	-do-
11	Case No. 2Gh/ 2010-11: State V/S Bhudi Singh	0.0113	-do-
13	Case No. 1Jh/ 2010-11: State V/S Lal Singh	0.0376	Jhandutta
14	Case No. 1,2&3 Sd/ 2010-11: State V/S K.P. Sharma.	5.0307	Sadar
15	Case No. 1Gh/ 2011-12: State V/S Roop Singh.	0.0075	Ghumarwin
16	Case No. 2Gh/ 2011-12: State V/S Lekh Ram.	0.0151	-do-
17	Case No. 3Gh/ 2011-12: State V/S Rattan Singh.	0.0376	-do-
18	Case No. 4Gh/ 2011-12: State V/S Smt Satya Devi.	0.0263	-do-
19	Case No. 5Gh/ 2011-12: State V/S Dlip Singh.	0.0075	-do-
20	Case No. 6Gh/ 2011-12: State V/S Raj Kumar.	0.0026	-do-
21	Case No. 7Gh/ 2011-12: State V/S Nand Lal.	0.0188	-do-
22	Case No. 8Gh/ 2011-12: State V/S Smt Santokhi Devi.	0.0075	-do-
23	Case No. 9Gh/ 2011-12: State V/S Amar Nath.	0.0038	-do-
24	Case No. 10Gh/ 2011-12: State V/S Banshi Ram.	0.0038	-do-
25	Case No. 11Gh/ 2011-12: State V/S Gian Chand.	0.0038	-do-
26	Case No. 4 Sd/ 2011-12: State V/S Rajesh Kumar.	0.0376	Sadar
27	Case No. 5Sd/ 2011-12: State V/S Khayalu Ram.	0.0038	-do-
28	Case No. 6Sd/ 2011-12: State V/S Devi Sagar & Raj Kumar.	0.0038	-do-
29	Case No. 12Gh/ 2011-12: State V/S Piyar Singh.	0.0038	Ghumarwin
30	Case No. 13Gh/ 2011-12: State V/S Lohka Ram.	0.1054	-do-
31	Case No. 14Gh/ 2011-12: State V/S Kirpa ram.	0.0527	-do-
32	Case No. 15Gh/ 2011-12: State V/S Suraj Parkash.	0.0414	-do-
33	Case No. 16Gh/ 2011-12: State V/S Smt. Sarita Devi.	0.1017	-do-
34	Case No. 17Gh/ 2011-12: State V/S Amar Nath.	0.0038	-do-
35	Case No. 18Gh/ 2011-12: State V/S Pohlo Ram.	0.0049	-do-
36	Case No. 19Gh/ 2011-12: State V/S Durga Ram Etc.	0.0113	-do-
37	Case No. 20Gh/ 2011-12: State V/S Rangil Singh.	0.0121	-do-
38	Case No.2 1Gh/ 2011-12: State V/S Kashu Ram	0.0038	-do-
39	Case No. 22Gh/ 2011-12: State V/S Sada Ram.	0.0075	-do-
40	Case No. 23Gh/ 2011-12: State V/S Baboo Ram.	0.0038	-do-

41	Case No. 24Gh/ 2011-12: State V/S Bhaghi Rath.	0.0008	-do-
42	Case No. 25Gh/ 2011-12: State V/S Sukh Ram.	0.0075	-do-
43	Case No. 8Sd/ 2011-12: State V/S Shyam Lal.	0.0301	Sadar
44	Case No. 9Sd/ 2011-12: State V/S Nand Lal.	0.0188	-do-
45	Case No. 1 Sw/ 2011-12: State V/S Baldev Singh.	0.0151	Swarghat.
46	Case No. 10Sd/ 2011-12: State V/S Mani Ram.	0.1656	Sadar.
47	Case No. 11Sd/ 2011-12: State V/S Brij Lal	0.0075	-do-
48	Case No. 12Sd/ 2011-12: State V/S Pohlo Ram.	0.0338	-do-
49	Case No. 13Sd/ 2011-12: State V/S Telu Ram.	0.0263	-do-
50	Case No. 14Sd/ 2011-12: State V/S Dev Raj	0.0376	-do-
51	Case No.15Sd/ 2011-12: State V/S Madan Lal.	0.0038	-do-
52	Case No.16Sd/ 2011-12: State V/S Smt. Mahanti Devi	0.0226	-do-
53	Case No. 17Sd/ 2011-12: State V/S Birbal.	0.0038	-do-
54	Case No. 18Sd/ 2011-12: State V/S Masatam	0.0038	-do-
55	Case No. 19Sd/ 2011-12: State V/S Smt. Sita Devi.	0.0038	-do-
56	Case No. 20Sd/ 2011-12: State V/S Ram Paul,	0.0075	-do-
57	Case No. 26Gh/ 2011-12: State V/S Jagar Nath	0.0376	Ghumarwin
58	Case No. 27Gh/ 2011-12: State V/Desh Raj	0.0263	-do-
59	Case No. 28Gh/ 2011-12: State V/S Sukh Ram.	0.1016	-do-
60	Case No. 29Gh/ 2011-12: State V/S Amin Chand.	0.0113	-do-
61	Case No. 30Gh/ 2011-12: State V/S Gandi Ram.	0.1881	-do-
62	Case No. 31Gh/ 2011-12: State V/S Ragar Chand.	0.0038	-do-
63	Case No. 32Gh/ 2011-12: State V/S Tulsi ram	0.0151	-do-
64	Case No. 33Gh/ 2011-12: State V/S Raama Nand.	0.0113	-do-
65	Case No. 34Gh/ 2011-12: State V/S Tulsi Ram	0.0376	-do-
66	Case No. 37Gh/ 2011-12: State V/Bansi Ram.	0.0339	-do-
67	Case No. 21/Sd/ 2011-12: State V/S Roop Lal	0.0226	Sadar
68	Case No. 1Kl/ 2011-12: State V/S Ram Parkash.	0.0035	Kalol

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3.10 **Legal Position:** The forest settlement was done by Mian Durga Singh in 1912. This settlement, however, was not done under the Indian Forest Act. The classification of forests, therefore has not been done according to the said act. The forest settlement report contains a set of rules, regulating the procedure for compensation/punishment in case of breach of these rules. The forests have been classified as mahfuza, mehduda and gair mehduda (dehati forests) corresponding to Reserve Forests, Demarcated Protected Forests and Un-demarcated Protected Forests under Indian Forest Act respectively. The Indian Forest Act was made applicable to these forests with effect from 29th June, 1949. The forest settlement of the dehati forests is going on and the dehati forests which have been declared as Demarcated Protected Forests up to 31.3.1994 have been given in appendix II. the objects of the forest settlement are:-

i. To constitute Govt. Forest Land and Waste Land into Demarcated Protected Forests and demarcate them on the ground.

ii. To prepare record of these newly constituted demarcated protected forests from revenue record.

iii. To determine rights of the people in such forests.

iv. To make entries of demarcated protected forests in the revenue record.

3.10.1 **Plantation:**

3.10.2 **Nurseries:** Detail of existing nurseries as on 30.11.2011 having an area of 0.50 hectare or above and their infrastructural requirement is given as under:

Sr. No.	Name of Range	Name of Block	Name of Beat	Name of nursery	Area in hectare	Infrastructural requirements
1.	Sadar	Sadar	Lakahanpur	Kharsa Changar	1.50	
2.	Sadar	Sadar	Markand	Sandoli	0.50	Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
3.	Swarghat	Swarghat	Jagaat-Khana	Jagaat-Khana	0.50	Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.

4.	Swarghat	Bhakra	Gwalthai	Naila Lehri	0.50	Water storage tank, Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
5.	Jhandutta	Jhandutta	Jhandutta	Jhandutta	0.50	Vermi-compost pit, Polyhouse, Root trainer, Mali Hut.
6.	Jhandutta	Gochar	Gochar	Ghandir	0.50	Polyhouse, Root trainer, Mali Hut.

1.10.3 Illicit Fellings: The position of the illicit felling cases is tabulated as under:

Sr. No	Year	Cases detected		Timber seized		Cases compounded	
		No.	Value	Vol. in ^{3}	Value	No.	Amt. realized
1.	1994-1995	NA	NA	NA	NA	NA	NA
2.	1995-1996	NA	NA	NA	NA	NA	NA
3.	1996-1997	NA	NA	NA	NA	NA	NA
4.	1997-1998	NA	NA	NA	NA	NA	NA
5.	1998-1999	NA	NA	NA	NA	NA	NA
6.	1999-2000	238	281313	1.329	12200	238	281313
7.	2000-2001	179	292536	0.575	2390	179	292536
8.	2001-2002	259	437583	10.0754	58600	259	437583
9.	2002-2003	156	273699	1 qtl. fuelwood	200	156	273699
10.	2003-2004	415	580932	2.2369	12200	374	541977
11.	2004-2005	208	418662	10.2696	166976	206	394125
12.	2005-2006	333	522245	19.276	180180	300	443290

13.	2006-2007	162	243822	83359	80671	192	296304
14.	2007-2008	80	201841	6.6336	78228	79	123613
15.	2008-2009	99	395958	2.9321	56381	89	213884
16.	2009-2010	97	254057	0	0	96	247868
17.	2010-11	177	609987	0	0	155	752312

1.11 **Rights and Concessions:** Forest Settlement of 1912 also inquired into rights and concessions in all the forests. These were recorded in the form of a settlement Report. All the Mahfuza and Mehduda (now Reserved and Demarcated Protected) forests were grouped in to 20 forest blocks. Rights and concessions are admitted in each of these forest blocks have been recorded in the Forest Settlement Report. The dehati forests (Un demarcated Protected Forests) were also grouped together and rights in respect of these are given in Chapter-IV of the settlement report. The Un demarcated Protected Forests are subject to liberal exercise of rights.

The main rights exercised by the people are as under:

1.11.1 **Timber For Buildings:** The right to building timber has not been properly defined. The provision prior to 2010 was that right holders would get timber for building from forests at fixed rates on application. Generally the T.D. was granted to the right holders ordinarily after an interval of 10 years except in case of emergencies. Now, T.D. Rules, 2010 notified vide GoHP Notification No. FFE-B-E(3)-43/2006-Vol-I dated 2nd January, 2010 are being followed. The timber granted to the right holders from 1993-94 to 2009-10 either free or on concessional rates are given in table 1.3. The concessional rates fixed in vide TD Rules, 2010 are given in table 1.4.

Table 1.3

FOREST PRODUCE GRANTED TO THE RIGHT HOLDERS FREE OR CONCESSIONAL RATES FROM 1994-95 TO 2009-10.

Year	No. of trees granted		Volume in cum	
	Conifer	Vol.	B.L.	Vol.
1994-1995	1016	2123.66	1333	2029.029
1995-1996	1302	2542.18	1135	1545.3678
1996-1997	1156	1929.46	1173	1655.553
1997-1998	891	1780.54	863	1389.992
1998-1999	601	1095.49	888	1380.653
1999-2000	823	1908.36	884	1985.775
2000-2001	689	1526.49	1049	2298.754
2001-2002	634	1359.58	971	2187.343
2002-2003	699	1541.04	801	1364.046
2003-2004	921	2158.47	939	1547.703
2004-2005	864	2189.13	923	2602.285
2005-2006	793	1811.34	935	455.758
2006-2007	184	304.96	301	271.035
2007-2008	121	102.85	197	112.903
2008-2009	0	0	0	0
2009-2010	0	0	0	0
2010-2011	0	0	0	0
Total:	**10694**	**22373.55**	**12392**	**20826.1968**

Table 1.4

CONCESSIONAL RATES

1.11.2 Rates. - The rates to be charged from the different types of Right Holders as per T.D. Rules, 2010 for grant of Timber Distribution are as under:-

(i) Right Holders above poverty line- 30% of the rates at which timber is sold by the Himachal Pradesh State Forest Development Corporation Ltd. commercially;

(ii) Right Holders below poverty line- 10% of the rates at which timber is sold by the Himachal Pradesh State Forest Development Corporation Ltd. Commercially; and

(iii) Right Holders suffering from natural calamities- Free of cost.

3.03.3 **Wood For Charcoal, Fuel For Marriages, Religious Ceremonies and Burning the Dead:-** The trees for fuel on special occasions like marriages and other religious ceremonies are sanctioned to the right holders for which concessional rates are charged. For burning the dead, the right holders can cut a tree up to 120 cms girth without permission and payment from Undemarcated Protected Forest but he has to inform the beat guard with in 10 days from cutting the tree. In case such trees are not available in the Un demarcated Protected Forests and in the private lands owned by the right holders, these can be cut from the Demarcated Protected Forests as well. The day to day requirements of fuel wood are met with by free cutting of brushwood and removal of fallen dry wood.

3.03.4 **Grazing And Grass Cutting:-** Except in grass reserves, locally known as grass godowns the concession of grazing in protected forests is admitted. The right holders can graze their cattle kept for domestic and agricultural purposes but not for pastoral purposes. The number of cattle and other animals which as individual household can graze has not been defined. The grass from grass godowns is auctioned annually where that from the closed area is distributed to the right holders through the concerned panchayats. In bamboo forests grazing is not permitted from the beginning of July to end September.

3.03.5 There is also the problem of migratory graziers of Kangra, Chamba and Gaddi. The grazing grounds have shrunk very much but the number of animals has rather disproportionately increased. Though this problem was considered at the time of forest settlement and a schedule for gradual ejectment of these graziers was prepared, yet some how, it has not been followed. Following year-wise statement shows the number of migratory cattle in this division:-

Year	Goat	Kid	Sheep	Lamb	Horse
1994-1995	7354	3633	9614	4036	25
1995-1996	6818	2505	8692	3793	25
1996-1997	6398	2210	8372	2387	13
1997-1998	9345	4562	15311	4947	48

1998-1999	6926	3094	7915	3439	43
1999-2000	15003	3150	8716	3779	36
2000-2001	6882	3100	8374	3029	30
2001-2002	6762	3250	6700	3776	33
2002-2003	6825	3317	8455	4017	38
2003-2004	6322	2777	7284	3288	25
2004-2005	6184	2875	7316	3393	25
2005-2006	6392	3000	7432	3339	33
2006-2007	5752	2648	7267	3285	36
2007-2008	5202	2398	6797	3103	37
2008-2009	4389	2313	5506	2609	24
2009-2010	5379	2701	6534	2958	30

1.11.6 Lopping of Trees for Fodder and Manure:- Lopping of Chil, Ban, Kelon, Shisham, Tun, Khair and Kikar is not allowed. Plucking of leaves from branches of other trees for fodder is allowed up to half of the crown of the trees but the lopping of branches for fuel is not permitted. Enforcement of these restrictions has, however, been very poor.

1.11.7 Rights and Concessions in newly constituted Demarcated Protected Forests:- The rights and concession being used by the right holders from long time in un-demarcated protected forests have been kept safe in the newly constituted DPFs (listed in appendix B) except grant of nautor. The abstract of such rights have been given in Appendix B-2.

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CHAPTER-II

FLORA AND FAUNA

PART 'A'

Forest Flora

2.1 Topographically the forests lie in the inner Shiwaliks and outer Himalayas, the elevation of which varies from 364 m to 2000 m. Climatically, they lie in the subtropical zone. The composition of the crop is materially affected by soil, moisture conditions, elevation, aspect, and ill defined numerous rights of user. Geological formations also affect variations in vegetation. The Chil and Bamboo forests occur mainly on Siwalik formations. A few patches of Chil and Bamboos, met with on Karol (Shali), Dagshai and Subathus series are of inferior quality. The tree growth in the scrub forests on Siwalik Formation is superior to the tree growth in the scrub forests over Karol (Shali) Series where Carissa opaca predominates. Chil forests are mainly restricted to the northern and eastern aspects while southern and western aspects support only scrub crop.

2.2 The following forest types and sub types conforming to the classification of Champion and Seth (a revised survey of Forest Types in India) occur in this division.

a) Sub-group 5 (b) Northern Tropical Dry Deciduous Forests:

(i) Type 5B C2- Northern Dry Mixed Deciduous Forests:
(ii) Type 5B C2-DSI-Dry Deciduous Scrub Forests.
(iii) Type 5B C2-E9-Dry Bamboo Brakes.
(iv) Type 5B Is2 Khair Sissoo Forests.

b) Group 9C – Himalayan Sub-Tropical Pine Forests:

(v) Type 9/C/ a Lower or Shivalik Chirpine Forests.
(vi) Type 9/C/ b Upper or Himalayan Chirpine Forests.
(vii) Type 9/C/ D.S.2 Sub-Tropical Euphoria Scrub Forests.

c) Sub Group 12/C1 Lower Western Himalayan Temperate Forests:

(viii) Type 12/C1 a Lower Western Himalayan Temperate Ban Oak (Q.incana) Forests.
Lower Western Himalayan Moist Deodar (Cedrus) Forests.

2.3 Group 5B - Northern Tropical Dry Deciduous Forests – 5 B C2 – Northern dry mix deciduous forests.

This type occurs mainly at lower altitudes and covers about 2/3rd forest area of the division. The type is represented mainly in the South – Western and Eastern parts of the division on Naina Devi Dhar of Swarghat Range, Kot Dhar of Kalol Range, Tiun and Seriun Dhars of Ghumarwin Range. In other parts this type does not occur extensively and is confined to the southern and western aspects. The crop is composed mainly of brushwood and of varying proportions of miscellaneous broad leaved trees. These forests are almost found on all degraded soils as all other sites have already come under cultivation. The trees which otherwise would have grown big enough for timber remain stunted and produce only fuel and poor quality small wood for local requirements. The species of commercial value found in this type are *Acacia-catechu, Bombax-cieba* and *Dalbergia sissoo.*

2.3.1 The stocking of the crop is variable. In smaller blocks of forests and heavily populated area such as Tiun, Seriun, Ajmerpur and Sunhani areas, the forest growth consists of brushwood only and the stocking is very poor, some of the areas being even blank. In larger blocks and populated areas such as Kot Kehloor, Baseh, Bachhretu etc. the stocking is generally dense though quite open near the villages. The brushwood consists of Carissa opaca, Dodonaea viscose, Nyctanthus arbortristis and the overwood of Anogeissus latifolia, Lannea coromandelica, Acacia catechu, Stephegyne, - pavifolia, *Bombax-cieba,* and Zizyphus-zuzuba. The overwood is generally scattered as single trees except for Anogiessus latifolia, which forms a distinct crop in the western parts of Naina Devi dhar, Kot dhar, Jajjar Forest and a few parts in Bachhretu Block, and Salmali malabarica which predominates in Ghan Forest, Osle, and a few parts of Chamyawan block.

2.3.2 Floristics:-The classified list of vegetation in this type is as follows:-

i. Trees:- *Anogeissus latifolia, Lannea-grandis, Acacia catechu, Stephegyne parvifolia, Aegle-marmelos, Bombax-cieba, Syzygium cumini, Feronia Limonia, Ehretia laevis, Flacourtia indica, Zizyphus-zuzuba, Mangifera indica, Cassia fistula, Wendlandia exerta, Embelica officinalis, Ficus rumphii, Ficus bengalensis, Terminalia tomentosa, Bauhenia verigagta, Laucenea leucophloea.*

ii. Brush wood:- *Carissa opaca, Dodonea viscose, Woodfordia fruticosa, Adhatoda vasica, Murraya koenigil, Nyctanthus arbortristis, Mallotus Phillippinenes, Euphorbea royaleana, Zizyphus nummularia and Lantana camera.*

iii. Climbers:- *Bauhenia vahlii, Pueraria tuberose, Mimosa rubicaulis, Zizyphus oenoplia, Cissampelos pareira, Clematis gouriana, Caesalpinia sepiaria, Abrus precatorius, Cuscuta reflexa, Crytolepis buchanani, Vallaris solanacea, Ichnocarous frutescens.*

iv. Grasses:- *Eulaliopsis binata, Eriophorum comosum, Cynodon dactylon, Chrysopogon fulvus, Hetropogon controtus, Botheriochloa intermedia, Themeda anathera, Cympogon marthi, Aristida depressa.*

2.3.3 Regeneration of trees species in respect of Acacia catechu, Cassia fistula, Anogeissus latifolia, Holarrhena antidysentrica and Lannea coromandelica as well as the coppice regeneration in the area felled in the past is not satisfactory due to biotic factors.

2.4 **Type 5ba 2 D.S.I. Dry Deciduous Scrub Forests:-** Due to unrestricted grazing, heavy lopping and repeated fires, the miscellaneous forest deteriorate into this type. This type is characterized by a low broken cover of shrubby growth 3 to 6m high, including some tree species reduced to similar condition. Many of the shrubs like Holarrhena and Dodonaea are distasteful for cattle or thorny as Randia and Carissa. This sub type occurs throughout Phetidhar and Seriun of Ghumarwin Range, Jamthal and Sangan etc. of Chamyoun Block. Most of the UPF areas support this type of scrub crop. With further deterioration, the proportion of Euphorbea royaleana increases.

2.5 **Type 5B-E/9 Dry Bamboo Brakes:-** Only one species Dandrocalamus strictus occurs and forms relatively low but dense brakes. More often, its occurrence is mixed with miscellaneous scrub species although pure patches are also met with as in Rattanpur C4 Kasol & Bachhretu C4 Gharwasra. Bamboo forests in the division are found on loose tertiary sandy soils of the Siwalik formations. The type occurs in extensive area on Kothar. Sizeable plots are also found in Ghaniri, Phetidhar, Kasol, Jamali, Ghan and Banjiar Forests. Its elevation zone is 365 m to 910 m.

2.5.1 Natural regeneration of bamboos is most unsatisfactory. The seed available from the sporadic flowering culms rarely germinate under the heavey shade of brushwood. The seedlings if any are prone to damage by heavy grazing after the rains. There has been no regular cycle of gregarious flowering in the recent past.

2.6 **Type 5B – 1 S2 Khair Sisoo Forests:-** The occurrence of this type is limited to small patches of sandy alluviams along the khads as in Ghumarwin Range along Sir Khad where Khair occurs mixed with Dalbergia sisso.

2.7 Group 9C – Himalayan Sub Tropical Pine Forest:-

Type 9/C/a – Lower or Siwalik Chirpine Forests:- This type occurs extensively in Sadar, Bharari, Ghumarwin and Jhandutta Ranges. These forests are usually pure associations of Chil occurring in the zone of 450 m to 1200 m elevation. The type dominates the central belt of forest areas occurring in 6 compact blocks known as Jhanjiar, Samoh, Gochar, Ghaniri, Fatehpur and Rohan. A few small forests like Palti, Rattanpur, Harlog, Tiun Khas, Dudian, Dholag Chaknar, Marotan, Dhanola, Chalava and Chogan etc. are found scattered in other places. These forests show a marked preference for the tertiary sand stones of Siwalik and Kasauli formations and northern and north eastern aspect.

2.7.1 Crop of different qualities and densities are met with. The forests are generally well stocked except the fire burnt area where they occur mixed with scrub as in Gochar C5b. Middle and younger age classes predominate. Trees with left handed twist are found occasionally but are more pronounced in Gochar and Rohan Forests.

2.7.2 Regeneration is easily obtained provided due protection against grazing and fire is available and the canopy is properly manipulated. However, on very shallow, rocky, or clays soils as well on southern and western sites, the seedlings do not fare well especially where the under growth is thick. The regeneration is present in the former type of areas.

2.7.3 The chief associates in these forests are:-

Dodonaea viscose, Carissa opaca, Woodfordia fruticosa, Mallotus phillipinensis, Flacourtia indica, Murraya koenigii, Indigofera pulchela, Myrsine Africana, Rubus ellipticus, Tylophora hirsute, Anogeissus latifolia, Acacia catechu and Dalbergia sisso.

2.8 Type 9C D.S.2 Sub Tropical Euphorbia Scrub:- This is the degraded stage of type 9C 1 and is found on badly denuded precipitous area with very shallow soil. Euphorbia royaleana some times forms consociations of considerable extent. This type of vegetation occurs in DPF Chamyoun, DPF Sangan, DPF Baryans and most of the UPFs of Chamyoun, Baryans and Bahadurpur blocks.

2.9 (C) Sub Group 12 C1 Lower Western Himalayan Temperate Forests:-

Type 12 C1a – Ban Oak Forests:- There is only one small plot of Quercus incana about 90 hectares in extent known as Bahadurpur. It is situated on the north-eastern aspect of Bahadurpur ridge at an elevation of 1600-2000 meters and forms a dense forest of all age classes. The ban trees are of good height and diameter growth, some of the well grown trees are 3 m in girth. All age classes are present in some places.

2.9.1 Regeneration of Quercus incana is fairly good especially under a light shade, but is not showing good progress due to overhead shade. In portions where Quercus incana has been clear felled, the dibbling of deodar seed in patches has been successful and deodar crop has come up well. The average height of the crop is 15.36 meters and average diameter 33 cm dbh.

2.9.2 The chief associates of Quercus incana in this type are:-

Rhododendron arboreum, Pyrus pashia, Berberies aristata, Berberis lyceum, Viburnum cotnifolium, Rhamnus dehurica, Myrsine Africana, Lyonia ovalifolia, Lonicera quinquelocalaris, Rhus cotinus, Daphne cannabina, Prinsepia utilis, Ilex dipyrena, Zanthoxylum alatum, Cotoneaster bacillaris, Rosa macrophylla, Rosa moschata and Hedra napalensis.

2.10 **Type 12/C Ic Lower Western Himalayan Moist Deodar Forest (Cedrus):**

Attempts were made at different times to plant deodar in the oak area of Bahadurpur Reserve but these were not very successful. During 1927, a plot of about 47 ha. on the northern side near the fort was sown with kail which came up successfully but later on due to fungal infection, the Kail trees started dying. Attempts to raise deodar in compact plots after clear felling Quercus incana were made from 1929 onwards which were quite successful. Conversion of Quercus incana forests into deodar forest then became an object of management. At present the area stock mapped under deodar in this forest is 15 hectares. The oldest patch of deodar is about 65 years in age. The diameter is satisfactory, though height growth is poor.

2.11 **Injuries to which the crop is liable:-** The forest crop is liable to injuries inflicted by many agencies, the intensity of which has unfortunately grown with the passage of time and as a result, the forest wealth is getting depleted. The effects of destruction are quite pronounced at places.

2.11.1 **Road Construction:-** The blasting of rocks and rolling down of debris and big boulders during construction of motor roads, causes a lot of damage to the crop on the lower slopes. Land slips and slides are the common features along the roads in this Division causing appreciable damage to forest crop during rainy season. The year-wise detail of No. of cases diverted under FCA, 1980 is given in the table below:

Sr. No.	Year	No. of cases	Area diverted in hectares	No. of trees involved
1.	1994	--	--	--

2.	1995	1	22.88	1486
3.	1996	--	--	--
4.	1997	3	2.64	1171 + Bamboo culms 165 Nos.
5.	1998	2	1.297	219
6.	1999	2	5.50	230
7.	2000	5	4.1479	374 + Bamboo culms 170 Nos.
8.	2001	4	122.9749	6150
9.	2002	3	6.7528	9332
10.	2003	9	46.998	4884 + Bamboo culms 4784 Nos.
11.	2004	3	2.3968	139 + Bamboo culms 51 Nos.
12.	2005	3	5.2145	1116
13.	2006	6	11.4199	942
14.	2007	6	13.3224	3738 + Bamboo culms 35 Nos.
15.	2008	4	25.4669	567
16.	2009	3	50.0099	1851
17.	2010	4	30.0021	1455
18.	2011	4	9.4681	31

2.11.2 Grazing:- This probably is the most important cause of injury to the forest regeneration. The right holders can graze unlimited cattle in chil and bamboo forests with the result that regeneration is grazed, browsed, trampled and destroyed. Soil is disturbed and the rate of soil erosion is accelerated, good top soil is lost, and xerophytic conditions are created which ease out the economic species like chil and bamboo as in Fatehpur C2, Swarghat and Jhanjiar C1 Plasla. The scrub forests also bear the brunt of gaddi grazing in addition to the grazing by the cattle of the right holders. This has resulted in most of these forests being reduced to blanks having only stunted scattered scrub species as in the case in most of the UPFs of Naina Devi Block. The graziers not only graze their animals but

also resort to lopping the trees. This has resulted in the gradual and systematic degradation of the forests.

2.11.3 **Lopping:** Lopping is common in all the forests except chil and ban forests. Owing to indiscriminate lopping, the seed production is reduced which affect the natural regeneration adversely and the canopy is interrupted resulting in the washing away of the soil from the over-grazed area. Khair and bamboos are the worst sufferers. Other species lopped are Chhal, Kachnar, Chuli, Kikar, Siris, Khirak, Tun etc.

2.11.4 **Drought:** Drought is very injurious and inimical factor, which causes heavy casualities in the plantation areas. April to June is very hot and dry season when most seedlings dry up and die. Weak monsoons and the failure of winter rains have marked injurious effect on the old crop also and the intensity of drought increases in the following hot weather. In bamboo forests, culm production is much reduced.

2.11.5 **Frost:-** Severe frosts are not common in this division. Frost damage had been reduced by the formation of the reservoir.

2.11.6 **Storms:-** Wind storms are common in the hot weather some of them being severe. These cause damage to the chil and bamboo forests by uprooting and breaking of chil trees and bamboo clumps.

2.11.7 **Snow:-** Snow is also a relatively unimportant factor. Snowfall, however, occurs annually at Bahadurpur and causes damage to the ban, deodar, chil and kail trees by breaking and uprooting them. The falls are, however not very heavy.

2.11.8 **Wild Animals & Birds:** Porcupines cause much damage in the chil regeneration and Khair plantation areas where the seedlings with the carrot base are nibbled at the bottom. They also eat bamboo shoots and girdle the base of khair trees. Monkeys uproot the chil seedlings to nibble at the root collar. They eat the bamboo shoots and chil cones also. Pigs damage the bamboo forests and nurseries by eating new culms and digging nursery beds. Parrots, flying squirrels and crows do much damage to the seed of all especially chil.

2.11.9 **Insects:** The bug worm causes defoliation of chil some times. The incidence is however sporadic. Termite attack is common in nurseries resulting in damage to the seedlings of chil, Khair and other B/L species.

2.11.10 **Fungus:** No fungus attack is noticed. However witches broom a bacterial disease is noticed on few khair trees in Swarghat and Kalol Ranges. So far no remedial measures have been taken to control this disease.

2.11.11 **Climbers:-** Lantana shrub is on the increase especially in all open and fire burnt area. Large areas especially of Un-demarcated Forests and in lands along the reservoir have been infested with this species so badly that the areas have become impenetrable. In the Demarcated Forest except for Bahadurpur Reserve and some parts of Jhanjiar and Fatehpur chil forests it has spread all over the tract. Bauhnia vahilii, Sepatholobus roxburgii and Puereria tuberose, cause some damage to the trees, especially in the bamboo forests where they cover and smother bamboo clumps. Parthenium hysterophorus commonly known as congress grass is also invading the tract making the invaded areas unfit for afforestation and is also becoming hazardous and a source of skin allergy, diseases.

2.11.12 **Fires:-** Fires are frequent during the summer months especially in chil areas. In regular crops of and above middle age with scanty undergrowth, the conflagration is generally confined to the ground and the crop stems are just scorched near the ground, but in crops in the sapling stage with scattered old seed bearers or in irregular forests with heavy undergrowth, the damage is usually heavy as the fire quickly reaches the crowns and completely wipes out the whole growing stock. An undergrowth of miscellaneous broad leaved trees may be a fire retardant to some extent but a dense shrubby under growth of Carrisa opaca, and Dodonaea viscose add to the intensity of the fire on account of the dry mass of chil needles with which the bushes are covered to various heights. Repeated fires in areas at lower elevation are inhibiting chil regeneration.

2.11.13 The chief predisposing causes of forest fires are drought, accumulation of pine needles, thick brushwood growth abundance of dry grass and felling debris. Fires may be started to drive out pigs and panthers from forests with dense undergrowth. But there is little doubt that the destruction of accumulations of dry pine needles (which prevent the growth of grass) is also an attempt to convert a predominately chil forest into a mixed chil and scrub jungle with its better grazing and extensive lopping facilities for the local right holders.

2.11.14 Fires affect fertilization and seed production to a considerable extent. An early summer fire interferes with fertilization of the cones and this reduces the seed production while a later summer fire burns the seed, or reduces the viability of seed in the cones of the succeeding year.

2.11.5 During the last 16 years an area of 6957.20 ha. has been burnt by the ground fires in this division as has been depicted in table 2.1. The average area burnt

comes out to be 434.82 ha. per annum. No incidence of crown fire occurred during the period of the plan under revision.

Table 2.1

Year	Area in hectares.						
	Sadar Range	Swarghat Range	Ghumarwin Range	Jhandutta	Bharari	Kalol	Total
1994-1995	200.5	325.8	0	324.5	0	30	880.8
1995-1996	0	110	74	606.3	343	30	1163.3
1996-1997	0	0	10	3.75	0	0	13.75
1997-1998	0	5	0	0	0	0	5
1998-1999	0	0	49.5	29.5	0	0	79
1999-2000	0	481	132	671	96.32	429.6	1755.9
2000-2001	0	171	16.5	32.5	0	0	220
2001-2002	0	0	0	0	0	0	0
2002-2003	108	65	50	61	160.64	29.5	474.14
2003-2004	184	71.75	48	157.6	268.6	9	738.95
2004-2005	0	37.5	39	31.2	128.1	8	243.8
2005-2006	53	132.5	26.25	80.25	97.5	32	421.5
2006-2007	0	0	0	0	25	20	45
2007-2008	91.5	0	2.1	2	71	20	186.6
2008-2009	100.22	65	21.7	98	25.6	5	316.42
2009-2010	157.5	43.5	23	140	47	2	413
Total	894.72	1508.05	492.05	2237.6	1262.76	615.1	6957.2

(Source: office record DFO Bilaspur)

2.11.6 A statement showing the names of the forests burnt during the period of the expiring plan with area burnt is given in appendix C.

PART 'B'

Forest Fauna

2.12 General Description:-Bilaspur Forest Division lies in the shiwaliks and Sub Himalayan Zones. Existence of a variety of vegetation, numerous rivers, streams, nallas and above all the Gobind Sagar Reservoir provide an ideal habitat for a great variety of wild animals, birds and aquatic fauna. This tract at the same time is very thickly populated. With the formation of the Gobind Sagar Reservoir, the oustees have been settled around and even amidst forest areas. A large number of gun licenses have been issued by the district authorities to local people for the protection of crops. This had adversely affected the wild life tract. With the imposition of complete shooting vide H.P. Notification F.No. 1-2/91-W.L.-I dated 27.9.91 an appreciable increase has been noticed in the number of wild animals and birds not only in the Naina Devi Sanctuary but also in the other forests too.

2.12.1 The important animals, birds and fish which are common occurance in this division are described briefly as under:-

(a) ANIMALS (MAMMALS)

(i) CARNIVORA

2.13 The Panther (Panthera Pardus):- Locally known as Bagh is occasionally met with all over the division but especially in Naina Devi, Tiun (Naswar) and Bachhretu blocks.

It is a sleek, short haired animal with a fulvous or bright fulvous coat marked with small close-set black rosettes. Average male is about 2 meters long weighing about 56 kgs. This animal generally remains in the neighbor-hood of villages carrying off sheep, goats and especially dogs at night. It seldom attacks human beings without provocation.

(ii) HARBIVORA

(a) Goat Antelope Group.

2.14 The Ghoral (Nemor haedus goral): It is a stocky goat like animal without stout limbs and coarse hair. Ghoral is generally found on rugged grassy hillsides or rocky ground in the forests. The animal has suffered very much at the hands of poachers because of its meat and has conseqtently retreated to the interior and difficult areas like Chamyawan, Bachhretu Baseh and Naina Devi Forest blocks.

(b) Deer Group.

2.15 The barking Deer (Muntiacus munt-jak):- It is locally known as kakar and is a sought after animal for its meat. Its colour is deep chestnut becoming darker on the back

and pale and dull below. Its height at shoulder is about 50-75 cms. The horns rarely exceed 13 cms. Generally it utters a subdued clicking noise but when alarmed and in fight the sound becomes a bark like cry for which the name barking deer is derived. It occurs throughout the division but is more common in Baseh and Naina Devi forest blocks. It is generally found singly.

2.16 **The Sambar (Cervus unicoeor niger):-** This is the largest deer, carrying magnificent horns. Its coat is coarse and shaggy and general colour is brown with a yellowish or grayish tinge. A full grown average male weighs about 230-240 kgs. The horns are about 90 cms. It is found in Baseh, Bachhretu, Naina Devi and Ghaniri forest blocks.

(c) **Pigs.**

2.17 **The Indian Wild Boar (Sus scorfa cristatus):-**

Locally known as Jungli Suar, is a notorious and an omnivorous wild animal living in grassy, bushy and also thickly wooded areas. It feeds on field crops, wild roots, tubers and even insects and snakes. It is grayish black, the skin being covered with a sparse growth of bristles which forms a conspicuous mane. Wild boar is a prolific animal giving at least two litters every year, one in the beginning of rains and second after the rains. A well grown male is about 80-90 cms at shoulder and may weigh up to 200 kgs. It is found in Naina Devi, Bachhretu, Malyawar and Baseh forest blocks.

(d) **Weasels.**

2.18 **Gothuor Himalayan Pine Martin:** The animal is very much valued for its fur. It is a predator and prays upon birds and their eggs and young ones of the deer and goat antelope family. It has been declared as a vermin.

(e) **Rodents.**

2.19 Common Indian Hare (Lepus nigricollis):- Locally known as Khargosh or serru is found everywhere but is more pronounced in Swarghat Range especially towards Bassi side. It feeds on grasses, seeds and fruits. Its head and body measures 40-50 cms and it weighs about 2 kgs. Though small, it is hunted for its meat.

2.20 **The Indian Crested Porcupine, (Hystrix Indica):-** Locally known as Seh or Sehl, it is found- throughout the tract. It is robust, heavy and terrestrial. The whole of its back is covered with long and well developed quils which may be nearly 60-70 cms. long. It feeds on vegetables, principally on roots and is destructive to plantations. The animals is fond of gnawing bones and when alarmed it utters a grunting sound, erects its

spines and inflicts injuries. It weighs 11-18 kgs. and is locally very much valued for its meat.

2.21 **The Large Red Flying Squirrel (Petaurista-Albivener):-** It is valued and hunted for its fir. It flys from tree to tree eating fruits and also insects, hiding under the bark. The damage it does to the forest crop is thus compensated by the help it renders by eating injurious insects.

NON-GAME ANIMALS

(i) **Dog family.**

2.22 **The Himalayan Fox (Vuloes bengalensis):** Locally known as Loomri, it is found throughout and lives in brushwood and cultivated lands.

2.23 **the Jackal (Conis indicus):-** Locally called Sear or geedar, it is found singly or in large numbers at night. It is one of the common scavenger.

(ii) **Cat Family.**

2.24 **The Jungle cat (Felis chans):-** It is locally known as jungle billi or ban billa. It inhabits the drier and open scrub part. It preys on small mammals and birds.

(iii) **Mongoose.**

2.25 **The common mongoose (Hepestes edwardsi):-** It is light grey to dusty brown animal locally called neola. It eats rats, snakes and birds.

(iv) **Weasels.**

2.26 **The common otter (Lutra lutra):-** Locally known as udbilao, it is quite active along the Sir, Sukar, Sarihali Khads and Govind Sagar.

(v) **Monkeys and Langurs.**

2.27 **The monkey (Macaca Muletta):** Locally known as bander, it is found every where, generally in herds.

2.28 **The Langur (Presbytis entellus):** It is found throughout especially in Naina Devi, Bachrettu, Baseh and Bahadurpur forests.

2.29

(vi) **Bats** locally called chamgaders can be seen in the evening amongst the trees, in search of insects.

BIRDS

Game Birds

Land Birds

(i) **Pheasants and Fowls.**

2.30 **The Red jungle Fowl (Gallus ferrugiens),** locally known as Jangli murghi or Kukar is found everywhere but especially in Nainadevi, Baseh, Rahan, Bachhretu, Gochar, Tiun and Malyawar forest blocks. It is one of the most important game birds of the tract.

2.31 **The Pea Fowl (pava cristatus):** Locally known as mor is the national bird and is protected throughout the country.

2.32 **The White Crested Kaleej Pheasant (Lophura leucome-lana),** locally known as Kolsa, favours thick bushes and shrubs. The male is blackish above with gloss of steel blue and has a white rumo, long white crest and scarlet patch around eyes; female is reddish brown.

(ii) **Patridges and Quils.**

2.33 **The Chakor (Alectoris gracia):** It is a large, plump, pinkish, grey brown patridge with rib like bars on flanks. Bill and legs are crimson. It is found on open hill sides and rocky slopes dotted with bushes and grass. Generally it lives in groups of 5-20 and keeps in neighbourhood of fields. It is common at Barog, Kothipura, Jamthal, Bandla and Panyala.

2.34 **The Black Patridge (Franco-linus francolinus):** commonly known as kala teetar, is a small game bird, about half size of a village hen, generally black and spotted white. The hens are pale and speckled black and white. It feeds on grass seeds, grains, white ants and other insects. It is a fast running bird, relying upon its legs to escape, and lives singly or in pairs. It is found throughout.

2.35 **The Grey Patridge (Francolinus pondi-cerianus)** locally known as safed or dhaula teetar is less common than kala teetar but is occasionally found in dry scrub country. It frequents bushy jungle and cultivated lands.

2.36 **The Mountain Quail (Ophrysia supper-cilliosa):-** Bater and rain quail (conturnix coromendelica) are rather very rare.

2.37 **Jungle Bush Quail (Perdicula asiatica)** also known as bater, is found more commonly in all areas upto 1200 meters altitude. It is of the size of a rain quail. The male is fulvous brown above and white below while female has pale pinkish rufous lower part. It lives in coveys of 5-20 which rest together and rise suddenly when almost trodden. It feeds on grass seeds, tender shoots and grains.

(iii) **Doves and pigeons:**

2.38 the Blue Rock Pigeon (Columba Livia) commonly known as kabutar has a grey colour with glistening metallic green and purple sheen on the neck and breast. It lives gregariously on cliffs and precipices. Large flocks regularly visit cultivated fields in search of food during winters.

2.39 Dove (Streptopelia spp.) commonly known as ghugee is found generally in groups in open places and cultivated fields. It approaches houses and even varandahs if not scared. Its flight is straight and swift.

Auatic Birds

2.40 Ducks, Teals, Goose and Cranes though not observed frequently are known to visit the Govind Sagar reservoir, especially the back side of the Bhakra Dam and areas near Sloa.

Non-game Birds

2.41 Numerous non-game birds are found in this division and only the important and conspicuous ones are mentioned below:-

2.42 Crows, King Crows, Treepies, Magpies, Jays and Nut Crackers:- The jungle Crow (Corvus macrorhynichos) replaces the common house crow (Corvus splendens) as a scavenger although the house crow is found during summers. The Himalayan red crowed jay (Garrulus bispecularis) and the black throated Jay (G. lacolatus) frequent the oak forest at Bahadurpur. The Himalayan nut cracker (Nuciferage-caryocatactes) can also be observed during winters.

2.43 Vultures Eagles, Kites and Falcons:- They are the scavengers and are found throughout.

2.44 The Black Eagle (Ictinaetus malayensis) is the commonest eagle found in the division.

2.46 In addition to the birds mentioned above owls (Strixspp) thrushes, babblers, flycatchers, finches, sparrows, buntings, wood packers, tree creepers, barbets, bulbuls (Molpastes cafer) tits, parakeets, wagtails and hill myna etc are found which are equally important from aesthetic, forest cleanliness, health, farming and bird watching points of view.

Reptiles

(i) Snakes

2.46 The common Indian Krait (Bungarus caeruleus) it inhabits more or less open country at low altitudes, seldom ascending above 1500 meters.

2.47 **The Indian Cobra (Naja naja):-** The cobra may be found in all types of country. It is very fond of water and the hot dry weather before the monsoons breaks in, is seldom found away from it.

2.48 **The Rat Sanke (Ptyas mocosus)** is widely distributed and usually frequents the open country in the vicinity of human habitations. It is the common snake of the tract.

Lizards

2.49 **The Common Indian Monitor Lizard (Varanus-monitor):-** It is found both in forests as well as in the outskirts of villages.

2.50 **The Common House Gecko (Hemidactylus brooki):-** It is found at all elevations and in almost all rest houses and range buildings etc.

Fish

2.51 Because of the vast potentialities of the Govind Sagar reservoir, fish culture and its trade is well organized on scientific principles. Numerous varieties of fish are known to occur either locally or have been introduced by the Fisheries Department. The more important ones are mentioned below:-

(i) **Local Species**

2.52 **Gid (Labeo dero):-** It is grayish fish with a narrow mouth, thick lips and with snout overhanging the jaws and covered with pores. It grows up to 1 ½ kgs in weight.

2.53 **Mahseer (Tor pituora):-** This fish is usually greenish above, light pink at sides with silvery white abdomen. It is a big fish which grows up to 40 kgs in weight and is much valued for the table.

2.54 **Singhara (Mystus seenghala):-** This fish has a chisel shaped mouth, grey colour and a sufficiently strong head shield. It is a very good table fish and grows up to 10 kgs in weight.

2.55 Besides the above, the following varieties of local fish are also found this area:-

i. Guj (Mesturambulus armetus)
ii. Gungli (Schizothorex sinatus)
iii. Jhalli (Cluposoma montana)
iv. Chilwa (Bariliens bandalensis)
v. Ticto (Punitus ticta)
vi. Sarana (Puntitus sarana)
vii. Bata (Labeo bata)
viii. Kuni (Labeo dyochielus)
ix. Topra (Garra lamta)

ii) **Introduced species**

a) **Indigenous**

2.56 Katla (Katla catla):- Its colour is dark grayish above, silvery on sides and grey on the belly. Its mouth is wide and lower jaw is more prominent . Head is broad but snout is very thin. It is also a big fish growing up to 30 kgs in weight.

2.57 Rohu (Labeo rohita):- Its dorsal profile is more convex than that of abdomen. Snout is depressed but projecting beyond jaws. Colour is bluish or brownish on back, becoming silvery on sides and beneath. It grows up to 20 kgs in weight.

2.58 Mrigal (Cirrthinus mrigals):- It is a fish with broad transverse mouth and beautiful eyes. Abdomen is rounded and snout depressed. It is silvery dark grey on the back, sometimes exhibiting a copper tinge. It grows up to 97 cms and 12 kgs in weight.

b) **Exotics:-**

2.59 Mirror carp (Cyprrinus carpio):- Its body is oblong and moderately compressed with a rounded snout. Its scales are of irregular shape or size but shiny like mirrors. It grows up to 20 kgs in weight.

2.60 Grass carp (Ctenophryngodon indella):- It is a dark grey fish with moderate sized scales and having upper jaw slightly longer than the lower. It grows up to 30 kgs in weight.

2.61 Silver carp (Hypothalmichthys molitrix):- The fish is silvery in colour with an oblong, slightly compressed body, pointed head, bluntly rounded mouth and having small eyes and very small scales. It attains a weight of about 10 kgs.

2.62 Injuries To Which The Fauna Is Liable:- Every wild species whether mammal, bird, reptile, aquatic or amphibian plays an important role in the maintenance of balance of nature and is useful to mankind in many ways. Every individual animal, bird or insect has been endowed with certain specific protective measures so that it can protect itself and reproduce, thus ensuring the existence of the species. But man has interfered with this balance of nature. So the greatest and only injury to which wild life is exposed is man himself. Not onely they are poached in the remotest and most difficult areas but every where in the forests. Trapping and poisoning of the wild animals on the pretext of protecting the crops, felling, conversion and planting works in the forests and other developmental activities are the disturbing factors for the existence of the wild life.

2.63 **Protection and Management of the Fauna:-** A separate wild life wing in the department of Forest Farming and Conservation Himachal Pradesh is responsible for the protection and management of wild life. To provide shelter and protection to different species of wild life the following two sanctuaries have been created in Bilaspur District.

Sr. No.	Name of Sanctuary	Area in hectares	Date of creation
1	Gobind Sagar	10,034.00	05.12.1962
2	Shri Naina Devi	16,335.00	05.12.1962

2.63.1 The area of these sanctuaries have been excluded from this working plan as these areas are to be managed under wild life management plan.

2.63.2 The shooting and hunting rules have been framed and applied to all the Reserved and Demarcated Protected Forests in the State vide Wild Life (Protection) Act, 1972. Presently there is a complete ban on shooting and hunting in the Pradesh.

2.63.3 Similarly the Fisheries Department of Himachal Pradesh is looking after and regulating the fish trade. They have established a fish farm at Ghagas where the following fish is reared and released in Gobind Sagar Reservoir:

i. Katla
ii. Rohu
iii. Mrigal
iv. Mirror Carp
v. Grass Carp
vi. Silver Carp

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CHAPTER-III

UTILIZATION OF THE PRODUCE

3.1 Agricultural Customs And Wants of the Population: Bilaspur District is a very densely populated tract. The density of population has increased from 253 per km² in 1991 to 327 per km² in 2011. The inhabitants are predominantly agriculturists. 91% of the agricultural lands are rain fed and the holdings are very small. The trend of population growth vis-à-vis land holdings have been depicted in the table 3.1 below during the last five decades.

Year	Total Population	% increase	Average land holdings (hectares)
1971	1,94,786	22.66	1.46
1981	2,47,368	26.99	1.38
1991	2,95,387	19.41	1.18
2001	3,40,735	15.35	1.08
2011	3,82,056	12.12	0.98

3.1.1 From the above table it is clear that the land holdings are decreasing with the increase of population. The people supplement their income by working on developmental works, in industries and their allied concerns in addition to Government jobs and trading etc. Wheat, Maize, Paddy (where irrigation available) are the major crops. In valleys people have started raising Mango & Citrus orchards also.

3.1.2 Creation of Bhakra reservoir, establishment of cement factories at Barmana and Bagha and Koldam, NTPC Ltd. Project have created additional pressure on the cultivated lands and forest areas. The resultant agricultural holdings are intermixed with forests.

3.1.3 There are four major towns in Bilaspur Division viz Bilaspur, Ghumarwin, Naina Devi and Talai. The villagers live in traditional houses with slate roof which are scattered all over as hamlets. With the easy availability of building material like bricks, cement, iron etc. the construction pattern has under gone a sea change. Modern RCC houses are common sight in place of dwellings. The timber of Chil, Shisham, Khair, Tun etc. is used for the construction of such dwellings.

3.1.4 Ploughing with a pair of bullocks is a common agricultural practice. For agricultural implements, Shisham, Khair and Chhal trees are in demand.

3.1.5 Cows, buffaloes and goats are reared for milk and manure. Goats are also reared for meat, sheep for wool, oxen for ploughing and horses & mules for transportation and carriage of material purposes etc.

The pressure on Un-demarcated as well as Demarcated Protected Forests for grass, loppings, grazing and browsing etc. is increasing so much, that the pressure of grazing per unit area, is much beyond the carrying capacity of these forests.

3.1.6 The yearly requirements of fuel-wood for 76400 families is 12,22,400 qtls. Or 1,75,880 m3 at the rate of 16 qtls per family per annum. About 30% of the requirement is met from the forests and the remaining 70% from the private lands, LPG connections and kerosene etc. The fuel wood in Bilaspur and Ghumarwin towns is supplied through the retail sale depots of the H.P. State Forest Corporation. The details of fuel wood supplied from these depots have been given in paragraph 3.4.3. This is a great burden on the forests. To avoid further denudation it is necessary to popularize use of non conventional fuel including biogas, fuel efficient chulhas and agro forestry on a large scale.

3.2 Markets and Marketable Products: With the promulgation of H.P. Resin and products (Regulation of Trade) Act 1981 and H.P. Forest Produce (Regulation of Trade) Act 1982, all timber and resin extraction operations are done by the H.P. State Forest Corporation Ltd. Shimla through its Working Division at Sundernagar. The timber extracted from the forests of this Division is taken to Him Kasth Sale Depot at Baddi / Parwanoo. The fuelwood and charcoal are sold at the retail sale depot at Bilaspur and Ghumarwin. Bamboo is mostly used by the local basket makers and the remaining finds its way to Ambala. Bhabber is being utilized by the paper mill and ban makers and other grasses by the local people. Resin is supplied to the Rosin and Turpentine Factory at Bilaspur. Khair wood is sold to the Katha manufacturing units of the Pradesh and outside concerns. Katha if manufactured is sent to Delhi market for sale. Other minor products like medicinal herbs, fruits and plants are utilized locally.

The principal marketable products from Bilaspur Division, therefore, are as under:

i. Resin.
ii. Chil timber and pulpwood.
iii. Fuel wood and charcoal.
iv. Bamboos.
v. Bhabber and other grasses
vi. Khair wood and Katha.

vii. Other minor forest produce like medicinal herbs (Banafsa, Gorakh Mundi, Brahmi, Chirata, Dudli, Alis, Gilo etc.) and fruits (Harer, Bahera, Amla etc.).

3.3 Lines of Export: A network of metalled and fair weather roads is available in almost every nook and corner of the tract. The road transport is therefore a quick and cheap mode. The trucks can reach right inside the felling coupes in most of the cases. However from forests on western side of Naina Devi Dhar and Kot Dhar fuelwood and other forest produce has to be carried on human backs, mules and boats up to the motorable road. Thereafter it is carried by trucks. National Highway 21 passes through the tract. Other important roads are:

i. Shimla Hamirpur road (Brahmpukhar to Haritalyanger. (49.55 kms.)
ii. Nagaon Beri road (7.10 kms)
iii. Bhager, Berthin, Deot Sidh, Barsar road (12.25 kms)
iv. Ghumarwin, Sarkaghat, Jogindernagar road (12.9 kms)
v. Ghumarwin, Talai, Bhakra road (46.0 kms)
vi. Dhadol Jahu road (23.82 kms)
vii. Kallar Paplah Thorghat road (22.17 kms)
viii. Bharoli Kalan, Jejwin, Salwar, Marotan road (28.75 kms)
ix. Panjpiri Janali road (16.00 kms)
x. Swarghat Bhakra road (37.68 kms)
xi. Swarghat, Jagat Khana, Jeori road (11.97 kms)
xii. Namhol to Nauni road (17.40 kms)

3.3.1 The interior parts of the tract and villages are connected with these major roads by a number of mettaled and fair weather roads given in appendix (ii). The total road length in the district is 946 kms which comes to 0.81 kms per sq. km of the tract.

3.4 Methods of Harvesting and Cost:-

3.4.1 Resin: Resin tapping in the Division is being done by the H.P. State Forest Corporation Ltd. after taking over the resin blazes for which, the said Corporation pays the royalty on the rates fixed by the Pricing Committee. Resin is collected in the forest depots and then transported to the Rosin and Turpentine Factory, Bilaspur. The yield of resin in the Division is tabulated below. The increase in number blazes vis-a vis higher yield from 1990-91 onwards is attributed to the adoption of rill method in place of cup and lip method. In rill method of resin tapping not only the small sized (above 30 cm d.b.h.) chil trees are tapped but the yield is also on the higher side as compared to cup and lip method.

Resin extracted from Govt. Forests of Bilaspur Forest Division

Year	No. of blazes	Resin extracted in quintals	Yield in Qtls Per 1000 blazes
1994-1995	115578	4729.91	40.92
1995-1996	119032	4811.34	40.42
1996-1997	104944	4205.12	40.07
1997-1998	66403	2394.96	36.07
1998-1999	49262	1972.68	40.04
1999-2000	43811	1749.30	39.93
2000-2001	82218	2950.94	35.89
2001-2002	80953	2441.54	30.16
2002-2003	88198	3217.34	36.48
2003-2004	87810	3423.71	38.99
2004-2005	86282	3589.38	41.60
2005-2006	85287	3216.23	37.71
2006-2007	86309	3372.29	39.07
2007-2008	86170	3415.64	39.64
2008-2009	86170	3339.99	38.76
2009-2010	85575	3288.65	38.43
Total:	**1354002**	**52119.02**	

(Source: Office record DFO Bilaspur)

3.4.2 **Rosin and Turpentine Factory Bilaspur:-** This factory was established by the H.P. Forest Department during 1969. With the creation of H.P. State Forest Corporation, this factory was transferred to it in 1974. The annual processing capacity of this factory is 74,000 qtls. raw resin. The resin is procured by Rosin and Turpentine Factory Bilaspur from Bilaspur, Hamripur, Mandi, Kullu, Una, Kangra, Chamba through respective Divisional Managers of HPSFDC Ltd. The production of Rosin and Turpentine oil during the last five years is as under:-

Year	Total Resin Processed in Qtls.	Rosin Produced in Qtls.	T. Oil produced in liters	% of Capacity utilization
2005-2006	54849	41766	1106405	74.12
2006-2007	46583	35858	897178	62.95
2007-2008	36583.37	27978.1	715130	49.44
2008-2009	56973.64	43140	1077403	76.99
2009-2010	52926.91	42688	1024550	71.52
2010-2011	57447.96	44284	1060296	77.63

(source:Office record GM Office HPSFCLTD Bilaspur)

3.4.3 Chil Timber and Pulpwood:- Before the nationalization of harvesting operations of timber in 1981-82 the standing trees lots were auctioned to the purchasers in open auction but now the standing trees lots are handed over to the H.P. State Forest Corporation Ltd. for harvesting. The H.P. State Forest Corporation Ltd. Pays the royalty on the rates fixed by the Pricing Committee at the State level. The trees are converted either in to logs or scants depending on the site conditions. Sawyers are generally local but some times they are imported from Mandi and Kangra districts also. The cost of harvesting varies according to location of the forests. On an average the total cost per m3 of timber delivered on road side with manual / mule carriage on average lead of 2 km works out to be Rs. 290 per m3 for coniferous species and Rs. 330/- per m3 for Broad leaved timber respectively. The break up cost is as under:

Sr. No.	Item	Conifer	B.L.
1.	Felling and Conversion	1300/- per m^3	930/- per m^3
2.	Mannual carriage up to 2 km lead	920/- per m^3	934/- per m^3
	Total	2220/- per m^3	1864/- per m^3

3.4.4 Fuel wood and Charcoal:- The working of the Fuel wood lots is the same as has been described in case of timber lots. Most of the fuel wood from these lots is sold in the sale depots at Bilaspur and Ghumarwin. The approximate cost of extraction of Fuel wood and Charcoal from forests to road side with a lead of 2 kms is Rs. 41/- per m^3 and Rs. 76/- per qtl. respectively. The break up cost is as under:-

Sr. No.	Item	Fuel Wood in m^3	Charcoal in Rs. In qtl.
1.	Extraction of Fuel wood	130.00	No Charcoal has been extracted from lots.
2.	Fellings Billeting, burning the charcoal and filling in Gunny bags	--	
3.	Manual carriage up to 2 kms	350.00	
	Total	480.00	

3.4.5 No extraction of fuel wood and charcoal from the forests of Bilaspur Forest Division and their sale at sale depots, Bilaspur and Ghumarwin has been done w.e.f. 2004-05 to 2009-10.

3.4.6 Bamboos:- Bamboo lots are also given to H.P. State Forest Corporation for working like timber lots. The H.P. State Forest Corporation pays 20% of sale value of bamboos extracted as the royalty to the Forest Department. The cost of extraction of bundle of bamboos including their transportation to the road side up to 1 km works out as under:

	Item	Rates per bundle
i)	Cutting & bundling of Bamboos of all commercial sizes	15.00
ii)	Manual carriage up to 1 km	3.00
iii)	Mate commission	12.50
	Total:	**30.50**

3.4.7 Bhabber and Other Grasses:- No Bhabber grass was leased out during the year from this Division during the year 1994-95 & 1995-96 and the detail in this regard from 1996-97 onwards is given in Table 3.4.7. The other grasses from grass godowns are also auctioned annually by the forest department to the local people. The quantity of grasses extracted and revenue realized is given in the below mentioned table:

Table 3.4.7

Year	Bhabber grass Qty.in "Qtls.	Revenue	Other grass Area in ha.	Revenue	Total Revenue
1994-95	N.A.	-	N.A.	-	-
1995-96	N.A.	-	N.A.	-	-
1996-97	1200	3600.00	N.A.	-	3600.00
1997-98	1100	3300.00	N.A.	-	3300.00
1998-99	950	2850.00	N.A.	-	2850.00
1999-2000	930	2790.00	1267.70	404155.00	406945.00
2000-2001	727	2181.00	1286.70	320691.00	322872.00
2001-2002	978	2934.00	1251.70	282820.00	285754.00
2002-2003	640	1920.00	1257.70	307070.00	308990.00
2003-2004	1029	3087.00	1259.70	303205.00	306292.00
2004-2005	1029	3087.00	1267.70	321135.00	324222.00
2005-2006	959	2877.00	1256.40	273355.00	276232.00
2006-2007	735	2215.00	1257.70	220110.00	222325.00
2007-2008	897	2698.00	1257.70	190320.00	193018.00
2008-2009	1113	3339.00	1257.70	269155.00	272494.00
2009-2010	294	885.00	1257.70	247750.00	248635.00

3.4.8 Katha:- Katha is a very important minor forest produce obtained from Khair trees. There are not many Khair trees in Govt. forest having exploitable diameter i.e. 25 cm d.b.h. However a large number of Khair trees exist on private lands which are marked on an approved 10 years felling programme. The Khair wood billet form is either exported as such to the Katha manufacturing factories within and outside the state or utilized by the Katha manufacturing bhatties locally. Two IBR boilers are established every year in this Division. on the Khair wood extracted from private areas as per 10 years felling programme.

Maximum quantity of Khairwood allowed to be used by the IBR units is 3750 Qtl.=5435Qtl.Khairwood with bark,2524MG.or say 2500MG

3.4.9 For putting up one bhatti at least 70-80 m^3 of standing volume of Khair is required (56 kg Katha is produced from 1 m^3 Khair wood), presuming that a bhathi produces about 35-40 qtls. of Katha in a season.

3.4.10 Medicinal Herbs, Fruit etc.:- Leaves of Bauhinia vahlii, gums from salambra and priara etc. and Harer fruits are being collected by right holders.

3.5 Past and Current Prices:- The prices of Forest produce like all other items of trade and consumption have increased considerably as given in the table below for the last five years.

Year	Av. Rate of chil per m3 standing Rs.		The Sale Rate of		
			Charcoal	Fuel wood (Rate per qtl)	Resin (Rate per qtl)
2004-2005	380	Public	--	265	
		Govt.	--	425	2200
2005-2006	568	Public	--	265	
		Govt.	--	425	2200
2006-2007	484	Public	--	278	
		Govt.	--	425	2700
2007-2008	431	Public	--	278	
		Govt.	--	616	2700
2008-2009	431	Public	--	360	
		Govt.	--	703	2750
2009-2010	626	Public	--	360	
		Govt.	--	703	3100

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CHAPTER-IV

ACTIVITIES OF FOREST DEVELOPMENT CORPORATIONS IN HARVESTING AND MARKETING OF FOREST PRODUCE

The exploitation works of the forests are executed through state owned H.P. State Forest Development Corporation Limited in respect of Bilaspur Forest Division, the exploitation of timber and extraction of resin are assigned to the forest corporation.

4.1 HARVESTING / EXPLOITATION OF TIMBER ONLY dry and fallen trees referred to as salvage are handed over to Divisional Manager, HPSFC Ltd. Hamirpur who has jurisdiction over this division. The position of last 5 years is given in Table 4.1.

Table 4.1 Salvage Removal from Bilaspur Forest Division

Year	Nature Of Marking	Chil Vol. cum	B.L. Volume Cum	Total Volume Cum
1994-1995	Salvage	2548.29	0	2548.29 cum.
1995-1996	Salvage	1109.8	0	1109.80 cum.
1996-1997	Salvage	3090.17	7.11	3097.28 cum.
1997-1998	Salvage	1040.705	189.77	1230.475 cum.
1998-1999	Salvage	0	59.179	59.179 cum.
1999-2000	Salvage	76.09	0.409	76.499 cum.
2000-2001	Salvage	2334.15	95.173	2429.323 cum.
2001-2002	Salvage	1203.75	146.769	1349.844 cum.
2002-2003	Salvage	354.25	23.2129	377.4629 cum.
2003-2004	Salvage	0	21.654	21.654 cum.
2004-2005	Salvage	492.07	471.9917	964.0617 cum.
2005-2006	Salvage	1993.11	0	1993.11 cum.
2006-2007	Salvage	4999.88	671.1223	5671.0023 cum.
2007-2008	Salvage	1922.74	118.435	2041.175 cum.
2008-2009	Salvage	2895.78	112.12	3007.900 cum.
2009-2010	Salvage	2586.25	44.926	2631.176 cum.

(Source: Office records of DFO Bilaspur)

The HPSFC in-turn gets the exploitation work executed through contactors called Labour Supply Mates (LSMs). The employment to skilled, semi-skilled and general is provided almost throughout the year except in winter months. On an average 2.7 mandays per cum of standing volume handed over to forest corporation are generated. If the total standing volume in a year varies from 3000 to 5000 cum then the total mandays generated would be 8000 to 13500.

4.2 EXTRACTION OF RESIN: Bilaspur is one of the main resin extraction divisions. The information is given in Table 4.2.

Table 4.2 Resin Extraction in Bilaspur Forest Division

Record of Resin blazes years wise and yield of resin and export			
Year	Total	Yield	Export
1994-1995	115578	4729.91	4729.91
1995-1996	119032	4811.34	4811.34
1996-1997	*104944*	*4205.12*	*4205.12*
1997-1998	66403	2394.96	2394.96
1998-1999	49262	1972.68	1972.68
1999-2000	43811	1749.30	1749.30
2000-2001	82218	2950.94	2950.94
2001-2002	80953	2441.54	2441.54
2002-2003	88198	3217.34	3217.34
2003-2004	87810	3423.71	3423.71
2004-2005	86282	3589.38	3589.38
2005-2006	85287	3216.23	3216.23
2006-2007	86309	3372.29	3372.29
2007-2008	86170	3415.64	3415.64
2008-2009	86170	3339.99	3339.99
2009-2010	85575	3288.65	3288.65

(Source: Office records of DFO Bilaspur)

On an average 480 mandays per annum are generated per section of resin tapping. In addition 700 to 1000 muledays are also generated for carriage of resin annually. Hence overall 1.5 to 1.75 lac mandays are generated annually of which about 60% labour is local and rest sourced from outside.

4.3 FUELWOOD AND CHARCOAL DEPOT Two fuel wood cum charcoal depots are being maintained one is at Bilaspur & another at Ghumarwin which caters to the needs of Bilaspur town & Ghumarwin town only. Although it provides timber to the residents it is a liability to the Department. The information of last 5 years is given in Table 4.3.

Table 4.3 Forest produce sold at Fuel wood and Charcoal Depot

Year	Forest produce.	Forest produce sold in Qtls.	Rate.	Amount realized.	Over heads (Rs.)
2007-08	Fuel	1102.57	276.65	305033	-
2008-09.	Fuel.	923.95	411.68	380375	-
2009-10	Fuel.	1210.50	370.16	448088	-
	Charcoal.	51.74	567.49	29362	-
2010-11	Fuel .	1289.68	344.27	444006	-
	Charcoal.	72.26	1119.20	80875	-
2011-12.	Fuel.	152.50	386.03	58871	-

(Source: Office record of D.M. Hamirpur)

4.4 MARKETING OF FOREST PRODUCE Timber extracted from this division is marketed through HimKasth sale depot Swarghat & Baddi. The resin is processed and further sold through Nahan and Bilaspur factories.

CHAPTER-V

FIVE YEAR PLANS

5.1 **GENERAL** The forests of the division have been managed for getting sustainable yield. The silvicultural fellings were aimed at making the forest uniform and the regeneration achieved through natural means. Till the early seventies, the emphasis was on planting commercially important species such as chil,khair, shisham etc. Growing demand of forest produce in the state especially that of timber resulted in focus on large scale plantations of commercially important species. Although the plantation programme started from I Five Year Plan but it gained momentum from III Plan onwards. The Plan wise management of forests is depicted as under:

5.2 **VIII FIVE YEAR PLAN (1990-95) The** JFM approach started in the division and the forestry activities were implemented under departmental schemes and under ODA project. As ban on green felling continued, the objective remained afforesting denuded/degraded forests. The constitution of forest development committees and their participation in planning and implementation was sought.

5.3 **IX FIVE YEAR PLAN (1995-2000)** The activities of ODA/DFID continued in the pilot phase and in the C & D phase. The works of afforestration, soil conservation, entry point activity started by the VFDCs and microplan process learnt and executed. Sanjhi Van Yojna started on the principles of JFPM. Here again the focus remained on restocking/regeneration of degraded forests.

5.4 **X FIVE YEAR PLAN (2000-2005)** Both the JFM programmes DFID & SVY created mass awareness about forestry but the focus was again on raising plantations besides soil works and entry point activities. The contribution in works to the tune of 5 to 15 % was desired but could not be persued properly. CAT Plan of Kol Dam was also implemented with emphasis on afforestration & soil, water conservation.

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5.5 Statement showing the revenue and expenditure w.e.f. 1994-95 to 2010-11

Year	Revenue	Expenditure				
		Non Plan	Plan State Sector	Plan Centre Sector	Capital Outlay	Total.
1994-95		N.A				
1995-96	1028074	9589143	11046409	4505280	633000	25773832
1996-97		N.A				
1997-98		N.A.			-	
1998-99	857765.	15792226	22465788	3155797	830000	42243811
1999-2000	2388953	13639545	25846071	1840000	521000	41846616
2001-02	6161243	18218083	18907589	3771839	330000	41227511
2002-03	6612874	18130038	19092920	1273751	390000	38886709
2003-04	118325040	34559084	19921448	3230705	567000	40278237
2004-05	230150553	40989625	3422298	4429844	250000	49091767
2005-06	279132035	43403964	14606228	10861595	2835996	71707783
2006-07	5884988	48189712	12987502	6233502	3950875	71361591
2007-08	6284630	41665568	9683673	1145231	2643300	55137772
2008-09	3591453	60610771	14048132	1341100	5685980	81685983
2009-10	46883667	69554748	8001392	1483437	5484013	84523590
2010-11	11864355	31188320	6461229	2918335	3164997	43732881

(Source DFO office Bilaspur)

Table 5.6 Plantations Raised from w.e.f. 2002-03 to 2010-11 in Bilaspur Forest Division

Table:- 5.6	
Year	Area in Hac.
2002-03	164.59
2003-04	196
2004-05	441
2005-06	974.71
2006-07	938.66
2007-08	530
2008-09	432
2009-10	147
2010-11	154

(Source: Office record DFO Bilaspur)

CHAPTER-VI

STAFF AND LABOUR SUPPLY

6.1 **Strength:** The following table shows the strength of staff as it stood on 29.02.2012 in Bilaspur Forest Division.

The following statement shows the present sanctioned strength of various categories of staff:

Sr. No.	Category	Sanctioned Strength	Existing Strength
1.	DFO	2	2
2.	ACF	--	1
3.	Range Officers	10	4
4.	Dy. Rangers	30	29
5.	Forest Guards	85	84
6.	Superintendent	1	1
7.	Sr. Assistant	3	3
8.	Jr. Asstt./Clerk	6	6
9.	Driver	1	--
10.	Peons	12	14
11.	Mali	4	3
12.	Chowkidars	15	15
13.	J.D.M.	1	1
14.	Forest Workers	183	164
15.	Boatman	2	1
16.	Peon-cum-Khalasi	1	1
17.	Dak Runner	1	1
18.	Cleaner	1	1
REVENUE STAFF:			
a)	Kanungo	2	2
b)	Patwari	1	1

In addition to above, 14 Nos. daily wagers are existing in this Division.

6.2 **Executive Charges:** There are 6 territorial Ranges, 20 Blocks, 72 beats, 2 check posts and 1 Van Thana in the Division. A detailed list of Ranges, blocks, beats and Van Thana with their headquarters is given in appendix G.

6.3 **Labour Supply:** Inspite of the fact that the state P.W.D., Bhakra Beas Management Board authorities, Rosin and Turpentine Factory, Cement Factory Barmana, and other small factories at Bilaspur employ a large number of skilled-unskilled labourers, adequate labour is available for all forestry works all the year round except during the peak days of farming operation from April to July.

6.4 Works like plantations, markings, construction of roads/paths, buildings, wood harvesting and charcoal making, bamboo, cutting etc. are done mostly by labour. Sawing and carriage of chil timber is done by the local labour but some times labour for these works is imported from Mandi and Kangra also.

6.5 Resin tapping is done by H.P. State Forest Corporation through labour supply mates who employ the local people for resin tapping. The present rates for resin extraction are as under:

Total resin collection slab (qtl.)	Rate per qtl.
Up to 20	333.50
20 – 25	376.45
25 – 30	458.35
30 – 35	499.15
35 – 40	540.10
40 – 45	605.65
Above 45	700.50

6.6 Skilled labour for the manufacturing of Katha is generally imported from U.P.

6.7 The following table gives the past and current rate of skilled and un-skilled labour in the division:-

Rate of Daily Wages in Rs.

Kind of Labour	During 1992	During 2011
Carpenter (1st Grade)	66.00	219.00
Masson (1st Grade)	66.00	219.00
Painter	40.70	164.00
Black Smith	40.70 to 51.70	153.00
(b) Un-skilled Labour		
Mazdoor	22.00	120.00

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CHAPTER-VII

PAST SYSTEM OF MANAGEMENT

7.1 General History of the Forests:- The history of the forests in Bilaspur is linked with the history of the Hill States of Himachal Pradesh up till 1800, there was no competition for forest land. The trees growth occurred without any interference from the biotic factors, and such areas could more appropriately be termed as "Jungles" rather than "Forests".

7.1.1 Around 1850, the dearth of good timber was felt in the North Western region of India. This was due to the fact that construction of the Government buildings was on the increase of Punjab. To fulfill this demand for timber the Rulers/Christians of the Hill States started leasing out the Forest area to private traders indiscriminately, primarily, to earn revenue for the State. The unmanaged fellings caused alarm in the British Government. The administrative policy of the English rulers (Punjab Government) for the region was of non-interference in the management affairs by the local Hill Chiefs. However, on the expert advice of Dr. Falconer, the first set of Forest Conservancy Rules for the Hill Districts of Punjab was sanctioned in 1855. In 1863 Dr. Cleghorn advised the Government to exercise more stringent control over the felling of trees by the Hill Rulers. In 1872, under the modified administrative policy, directions were issued by the Ruling Chiefs by the Superintendent of Shimla Hills (Mr. Macnab) asking them to manage the forests on scientific lines. Bilaspur State was also one of such hill states to which these direction were issued.

7.1.2 From 1872 to 1887 not much was done in this regard. Only Forest Watchers (Rakhas) were appointed and charged with the duty of protection of the forests against encroachment and illicit fellings by the people.

7.1.3 In 1888, when it was found that the Ruling Chiefs of the Shimla Hill States were not taking due interest in the management of their forests in spite of the directions issues, a special committee consisting of Commissioner Delhi Division, Superintendent Shimla Hill States and the Forest Officer Shimla Division was constituted. All the Chieftains of the Hill States were also represented in the committee. The committee made a number of recommendations which were approved by the Government. These were:-

i) All the Forest areas were to be divided in to three classes namely:

a) Reserved Forests (Mahfuza):- These comprised forest areas which were to be free from all rights. Such forests were to be demarcated by boundary pillars,

b) Protected Forests (Mahduda):- These comprised forest area in which right holders had and were to be given certain specified rights. Forests of this class were also to be demarcated by boundary pillars and,

c) Village Forest (Dehati):- These comprised the entire 'Banjar' area in which trees were growing or were likely to grow, but in which all the rights of user or the right holders were reserved.

ii) The demarcation of the boundaries of the 'Mahduda' and 'Mahfuza' forests (Protected and Reserved Forests) and the settlement of the rights would be done by the respective States. The work was to be carried out with the advice and under, the guidance of the Divisional Forest Officer (Shimla).

iii) Grazing by Gujjars, setting fires to the forests and cutting and lopping of trees were to be prohibited.

7.1.4 There was a considerable confusion and delay in carrying out the demarcation of the forests and recording the rights of the right holders in Bilaspur District. In 1888 the Forest Department in Bilaspur was organized and put under the charge of a Range Officer and some Forest Guards were appointed in addition to the existing Rakhas.

7.1.5 It was not until 1900, that a set of maps showing boundaries of the proposed forests was prepared. These Forest maps were not in agreement with the maps prepared during the Land Revenue Settlement of 1912.

7.1.6 In 1901, the first Working Plan was prepared for a period of 10 years by Mr. E.M. Coventry. However, the procedure and the system proposed in the Working Plan was not adopted. The system proposed has been discussed in the subsequent paragraphs under past system of management.

7.1.7 Finally, in 1912 the Forest Settlement Report was issued. The three categories of forests were created, viz Mahfuza (Reserve Forests), Mahduda (Demarcated Protected Forests) and Dehati (Un-demarcated Protected Forests respectively.

7.1.8 Some time around this period all the Rakhas were replaced by paid Forest Guards and the planned and regular working in the Forests started. From 1911 to 1921, annual working plans were prepared by Divisional Forest Officer, Shimla. From 1922 to 1931, no Working Plan was followed and the fellings were only done to meet the local requirements of the right-holders i.e. no commercial fellings of trees was done. However, during the period Bamboos were exploited on a two year's felling cycle.

7.1.9 Regular Working Plan was prepared in 1932 for a period of 19 years by Shri Ishar Singh but was followed till 1954. This Working Plan was revised in 1954 by Shri Ishar Singh. The fourth revision was done by Shri Gurmit Singh in 1975. The fifth revision was done by Shri P.C. Verma. The Working Plan under revision expired on 31.03.2009.

7.2 Past Systems of Management And Their Results:- The past systems can be studied in three phases: (a) Initial phase 1900-1931 (b) Transition phase 1932-1953 and (c) The Period of Regular Management 1954 to date.

7.3 Initial phase (1900-1931):- The total forest area encompassed in the first Working Plan was 23348 acres. However 1979 acres of grass Reserves were excluded from the management. The Forests were divided into four working circles as follows:

1.	Chil Working Circle	6441 acres (2607 ha)
2.	Fuel Working Circle	7501 acres (3036 ha)
3.	Bamboo Working Circle	7312 acres (2959 ha)
4.	Oak Working Circle	295 acres (119 ha)
	Total:	21549 acres (8721 ha)

7.3.2 Chil Working Circle:- All Chil forests were included in it and Chil trees above 1' (30 cm) d.b.h. were enumerated. The large trees were malformed and scattered. The method prescribed was thinning on five year's cycle. Bush cutting and sowing of Chil seed was also prescribed in certain areas. Closure for a period of 5 to 10 years was also prescribed. No yield was prescribed.

7.3.3 Fuel Working Circle:- All the scrub forests were included in it but fellings proposed over a small area only. The rotation was fixed at 20 years and 20 trees per acre were proposed to be retained as standards. The yield of fuel wood was estimated at 200 maunds (80 quintals) per acre. Cutting of thor (Euphorbia royleana) in the coppice coupes and closure for a period of 5 to 10 years was also prescribed in the coppice coupes and certain additional areas.

7.3.4 Bamboo Working Circle:- All the areas containing Bamboos were included in it. The cutting was fixed at 2 years, and each forest was divided in to 2 parts to be worked in alternate years. An annual yield of 1 lakh bamboos was estimated. Sowing of Bamboo was also proposed along with closure. During the rains closure of all bamboo forests from grazing was proposed.

7.3.5 **Oak Working Circle:-** The Bahadurpur forest was the only Oak forest in the State. Thinnings on a rotation of 10 years and selection fellings for the removal of big trees were prescribed. Planting of Deodar and sowing of Ban were also prescribed.

7.3.6 Because of non-settlement of the rights of the people, and lack of interest on the part of the State Administration, the prescriptions of the plan were not carried out in right earnest. Bamboos continued to be exploited without any system. However, the closure of Bamboo Forest during rainy season was started, some work of sowing and planting of Deodar, Kail, Ban and Bamboo was started and fire protection was introduced. The effect of these workings has not been reported except for the comment that a beginning had been made.

7.4 **The Period 1911-1921:-** The exploitation of Chil was started on the basis of annual plans prepared by D.F.O. Shimla. The Chil Forests were required to be thinned on 5 years cycle. Coppice fellings were started. The Forest settlement was done by Mian Durga Singh, Wazir of the State. The area reported with the Forest Boundaries was 32364 acres. The Forest Boundaries also contained chunks of private properties to the extent of 1731 acres. The Forests were divided in to 20 individual Forest Blocks and 88 compartments. The removals in the thinning are reported to be on the higher side and there was near depletion of the big sized Chil trees in the forests.

7.5 **The Period 1922 – 1931:** Commercial fellings of trees was stopped except for the requirement of the right holders. However bamboos continued to be exploited.

7.6 **Transition Phase 1932 – 1953:** A regular Working Plan was prepared by Shri Ishar Singh and was made operational in this period. However, most of the prescriptions were not tested and hence the period is considered as the transition phase. The forests constituted 15 Forest Blocks and 118 compartments.

The total area encompassed in the Working Plan increased to 31133 acres. The following five working circles were constituted:

1.	Chil Working Circle	7808 acres (3160 ha)
2.	Fuel Working Circle	2818 acres (1140 ha)
3.	Bamboo Working Circle	7919 acres (3205 ha)
4.	Ban Working Circle	285 acres (115 ha)
5.	Misc. Working Circle	12303 acres (4979 ha)
	Total:	31133 acres (12599 ha)

As compared to the Working Plan prepared in 1900 the area has been marginally increased in the Chil Working Circle and the Bamboo Working Circle. However, there is a very significant decrease in the Fuel Working Circle. The demarcated areas which could not be fitted in to the other working circles were included in Misc. working circle. The forests in Misc. Working Circle contained trees of no commercial value.

7.6.1 Chil Working Circle:- This included almost all the chil bearing forests. The crop being immature only thinning on 10 years cycle were prescribed with a view to (a) encourage competition, free growth of best individuals and (b) make the crop uniform and regular. Resin tapping was not prescribed but mention was made that it could be done. No yield was prescribed.

7.6.2 The forests were thinned as per prescriptions. However, the fires played havoc with the conversion to uniform crop. All efforts in this respect went waste. Resin tapping was started in the forests in the period preceding the World War II i.e. during 1937, when the market for resin was looking up.

7.6.3 Fuel Working Circle:- The method of treatment prescribed was coppice with standards with a rotation of 30 years (Sixty years for standards). The coppice areas could be supplemented with sowings and plantings. Thinnings and cleanings were also prescribed. The 10 year closure for the coppicing was not found adequate and hence increased to 15 years subsequently. Sowings and plantings were also not found to be successful due to persistence of drought like conditions.

7.6.4 Bamboo Working Circle:- The whole tract of Naina Devi was included in 'Bamboo Working Circle'. The crop could be divided in two distinct classes. Firstly, the areas in which bamboos predominate and secondly, the areas in which misc. species predominate. Bamboo areas were prescribed to be worked on a 4 year cycle and the misc. crop area were prescribed to be worked under coppice system with a rotation of 30 years.

7.6.5 The bamboo forests were exploited but the coppice coupes could not be worked because of lack of demand of fuelwood. The bamboo forests were not cleaned because of resistance from the local right holders. Also effective closures of bamboo areas could not be done as a result the bamboo forests in general, deteriorated. Extensive flowering of bamboos also created further problems.

7.6.6 Ban Working Circle:- If contained roughly the same areas as were included in the First Working Plan prepared in 1900. The method of treatment prescribed was to (a) make efforts to convert the Ban Forests in to Deodar Forests by removal of Ban trees and

planting of Deodar. (b) encourage Ban and other trees on sites where Deodar was found not suitable.

7.6.7 The prescriptions succeeded in as far as Deodar planting was concerned. However, the Ban planting / sowing was not successful.

7.6.8 **Misc. Working Circle:-** The forest areas with tree growth of miscellaneous, non commercial species were put in Misc. Working Circle. This Working Circle was also burdened with the demands of the right holders. No rigid prescriptions were laid down for this circle. Misc. trees were to be worked on 10 years cycle on selection basis for meeting the requirements of the right holders. Bamboos were to be worked on 2 year cycle. Sowing and planting where ever possible was suggested. The 'Begar' system in which unpaid labour extracted fuelwood for the 'State use' was regulated.

7.6.9 The requirements of the right holders were widely distributed in time and space. It was not possible to work the forests on a cyclic basis. There were also too many feeling series to meet the demands of the right holders which proved impracticable. Sowings and plantis done on a minor scale in Bhioo and Sadyar compartments proved successful. All Khair trees over 2' (60 cm) girth were felled from parts of Baseh and Bachhretu blocks. Natural regeneration in chil areas came up well but destroyed by fires in most of the places.

7.7 **Regular Phase**

7.8 **1954 to 1974:** The working plan for the period was compiled by Shri Ishar Singh, Forest Officer. Five Working Circles were proposed as under:

1.	Chil Working Circle	7938 acres (3212 ha)
2.	Fuel Working Circle	6548 acres (2650 ha)
3.	Bamboo Working Circle	4453 acres (1802 ha)
4.	Ban Working Circle	224 acres (91 ha)
5.	Protection Working Circle	12280 acres (4969 ha)
	Total:	31443 acres (12724 ha)

7.8.1 The areas of the Working Circles were almost correlated with the areas of the previous working plan. The only noteworthy aspect was the increase in the area of Fuel Working Circle and almost corresponding reduction in the area of Bamboo Working

Circle. The inaccessible areas of all the Working Circles were included in Protection Working Circle.

7.8.2 Only significant change in the objectives of management and the prescriptions was the leaning towards the soil conservation aspects of the Forests in view of the then proposed Bhakra Dam and reservoir.

7.8.3 Chil Working Circle: No change was effected in the objectives and prescriptions. Resin tapping by cup and lip method was practiced. The annual yield prescribed for PB I was 93000 cft (2600 cum) and 35000 cft (980 cum). The sequence of the fellings was also laid down which could not be adhered to because of fires. The yield realized from PB I areas was in arrear by 1,46,946 cft (4114 cum) whereas the yield from other PBs was in excess by 5,7500 cft (16100 cum) at the end of the working plan period. Seeding fellings in PB I areas remained erratic. Fires and lack of protection did not allow the natural regeneration to come up in most of the PB I areas. Against an area of 6036 acres (2443 hectares) prescribed for thinning, only 3842 acres (1555 ha) was gone over.

7.8.4 Fuel and Bamboo Working Circles:- No significant changes were suggested in the Bamboo working Circle. However, because of the opening of the area with the construction of new roads (mainly Kiratpur – Bilaspur) the demand of bamboos on commercial scale was not there and the local right holders and the people of adjoining Punjab region accounted for most of the removals both by legal and illegal means.

7.8.5 Ban Working Circle:- The aim of this Working Circle was to raise a deodar plantation over an area of 40 acres (16 ha) by replacing ban with deodar. The ban was to be used for conversion in to charcoal. The ban outside the deodar plantation area was to be thinned on a 10 years felling cycle. The prescriptions except thinnings were followed 3 to 5 acres (1.2 ha to 2.0 ha) of Ban oak forest was cleared every year and planted with deodar except in the last three years of the plan. No cleanings and thinnings were carried out in deodar plantation. There was a large scale snow damage due to congestion.

7.8.6 Protection Working Circle:- Rotational closures of the area was prescribed to nurse the area back to health. The prescriptions for closure went unnoticed and were generally not followed i.e. nothing was done to check heavy grazing and lopping by the people and the areas were further degraded. Bamboo areas of this Working Circle was to be worked out on 4 years cycle which was also not worked.

7.9 Period 1975 to 1994:- The Working Plan for the year 1975 to 1994 was prepared by Shri Gurmit Singh, IFS. The following working circles were constituted.

1.	The Chil Working Circle	4466.30 ha. (11036 ac)
2.	The Fuel wood Working Circle	3434.65 ha. (8487 ac)
3.	The Bamboo Working Circle	908.81 ha. (2246 ac)
4.	The Plantation Working Circle	6340.44 ha. (15668 ac)
5.	The Protection Working Circle	3506.84 ha. (8666 ac)
6.	The Khairs (Over Lapping) Working Circle	18657.04 ha. (46103 ac)

A variation in the area statements of fuelwood Working Circle, plantation Working Circle and Protection Working Circle was observed in the areas shown in summary of areas allotted to different Working Circles and the area actually allotted and shown under the respective Working Circles. These variations are summarized as below:-

Working Circle	Area shown in summary table (Page 64 Gurmit Singh Working Plan) Hectares	Area shown in Working Circle description Hectares
Chil Working Circle	4460.30	4466.30
Fuel wood Working Circle	3401.45	3434.65
Bamboo Working Circle	908.81	908.81
Plantation Working Circle	5704.64	6340.44
Protection Working Circle	4013.24	3506.84
Grand Total:	18494.44	18657.04

Thus the total area under all Working Circles works out to be 18657.04 ha. as against 18494.44 ha. shown in Gurmit's Working Plan. This is due to variation in the actual total areas of DPFs under different Working Circles and as shown in the summary table.

7.9.1 **The Chil Working Circle:** This Working Circle comprised all the demarcated and undemacated protected forests in which chil occurred either pure or in fair proportion and where the locality factors permitted the system of concentrated regeneration fellings. An area of 4466.30 ha. was kept in this Working Circle out of which 3356.60 ha. was of D.P.Fs and remaining 1109.70 ha. of U.P.Fs.

7.9.2 The system of the management was Irregular Shelter Wood System, main features of which were:-

i. Compact groups of well grown poles were to be retained as part of the future crop.

ii. Where steepness of grounds inhibited the method of concentrated fellings, marking were to be done on selection principles.

7.9.3 Exploitable diameter was fixed at 60 cm d.b.h corresponding to a rotation of 120 years with four periodic blocks each of 30 years age gradations. The un worked compartments of the expiring Working Plan, badly fire burnt areas, partially regenerated areas and young plantations which were not fully established and forests with overwhelming mature and over mature trees were allotted to PB II. The compartments bearing established chil regeneration of reasonable density were allotted to BP IV. All other forests which were not allotted to PB I, PB II and PB IV were allotted to PB III. Definite rules for marking were laid. Subsidiary cultural operations were prescribed.

7.9.4 In this Working Circle, two fellings were prescribed i.e. seeding fellings and final fellings. In seeding fellings every thing was prescribed to be removed from PB I areas except seed bearers and advance growth in compact groups up to 30 cm d.b.h. Healthy middle aged trees free from any defect were kept as seed bearers for the production of seed and future regeneration. N cooler aspects 15 seed bearers were to be kept. These were to be increased to 20 on warmer aspects and also to 25 on refractory areas. Thinnings were prescribed in the compact groups of advance growth and removal of over wood where the regeneration was established. In PB II no commercial fellings were prescribed. D Grade thinning were prescribed along with improvement fellings where ever these were required in PB III areas. In PB IV areas it was prescribed to remove the overhead cover along with light thinning and cleaning in the young regeneration. The above prescriptions were badly ignored during the period of the expiring working plan and defeated the very objective of the management of making the forests regular and uniform.

7.9.5 Total enumeration of al tree species had been carried out down to 10 cm d.b.h. in standard 10 cm diameter classes. The total growing stock of this working circles was 395471 m^3. The yield was calculated by modified Van Mentlis formula.

7.9.6 The annual yield of 2900 m^3 was prescribed for P.B. I for which sequence of fellings was also laid down. This sequence, however, could not be adhered to because of fires and other administrative factors. Consequently yield realized from P.B. I areas was in arrears by 19692 m^3 by the end of the year 1993-94. Similarly in case of P.B. IV where

an annual yield of 700 m³ was prescribed, the yield in arrear was 605 m³. Against an annual yield of 4400 m³ from all PBs, the removal from all PBs was in excess to the tune of 20520 m³ by the end of 1993-94. Most of the excess removal was due to the drying up of Chil trees which were marked to the right holders for their domestic use. By the end of 1993-94 an area of 1832 hectares was in arrear in PB III and IV where thinnings were prescribed to be carried out.

7.9.7 **The Fuel wood Working Circle:-** All the well stocked scrub and Ban forests were included in this working circle with a view to meet the demand of fuel wood of the neighbouring towns and to improve the stocking of the valuable species of these forest. This working working circle was worked under coppice with standard system with a rotation of 35 years for coppice and 70 years for the standards. Yield was prescribed by area. Bamboos in these areas were to be worked on a 3 years felling cycle. After the coupe was worked the area was to be closed for a period of 10 years for regeneration to come up. To supplement the natural growth, planting of better species like Khair, Simbal, Chil, Bamboos, Bahera, Harer, Jamun etc. were to be done. The gross area of this working circe was 3434.65 hectares.

7.9.8 Keeping in view the conservancy of the forests and ban on oak fellings by the Government the sequence of the fellings could not be adhered to. Till 1993-94 the accumulated arrears of fellings were to the tune of 1255 ha. Due to lack of closure and protection both the plantations raised and coppice regeneration in most of the felled areas of this working circle failed. The condition of most of the forests worked deteriorated instead of improving.

7.9.9 **The Bamboo Working Circle:-** This Working Circle was to cover all the areas where bamboo was found either pure or mixed in sufficient proportion from where it could be commercially harvested. Selection fellings of bamboos on a three year cycle were prescribed by treating a clump as a unit of management. The total area of this Working Circle was 908.81 ha.

7.9.10 The yield of bamboos was prescribed to be regulated by area. More or less equi-productive annual coups were made. Definite methods of fellings, subsidiary silvicultural operations, rotational closure and planting programme were prescribed but these were not followed in letter and spirit. The right holders were allowed to lop the bamboos for fodder leading to destruction of bamboo clumps. The annual closure was also not enforced during the rainy season.

7.9.11 With the transfer of Naina Devi Range to the Wild Life Wing of the department during 1987 almost all the bamboo bearing areas came under Wild Life management and thus the harvesting of bamboos practically came to stand still. Till 1993-94 the arrears under this Working Circle accumulated to 833 ha. Most of the clumps became congested in the absence of scientific working and cultural operations. The reduction in the felling cycle of bamboos from 4 years to 3 years have thus no effect in the absence of hygienic fellings.

7.9.12 The Plantation Working Circle:- All the Demarcated Protected Forests supporting inferior scrub and brushwood crops and also most of the poorly stocked un-demarcated protected forests, where economic plantations could be raised were included in this working circle. The areas where economic plantation had been raised in the past few years but were not established were also included in this working circle. Total area under this working circle was 6340.44 hectares out of which 1989.64 hectares was from DPFs and remaining 4350.80 hectares was from UPFs.

7.9.13 Most of the areas under this working circle had already been planted under one or another scheme. The survival success varies from area to area depending on the species planted and season of planting. The average survival % for Chil and Khair varies from 40 to 60 and that of other broad leaved species is less than 20. The planting programme could not be adhered to due to budgetry and other constraints.

7.9.14 The Protection Working Circle:- The forests situated on precipitous slopes and difficult terrain which could not be commercially managed or were very much degraded or barren or waste lands not fit for intensive managements were included in this working circle. An area of 2462.84 hectares of DPFs and about 8000 hectares of UPFs was kept in this working circle.

7.9.15 The objects of management of this Working Circle were:-

i. To protect the areas against denudation and soil erosion.

ii. To give rest to the over exploited areas and to provide for their improvement.

iii. Compatible with the above, to meet the bonafide requirements of the right holders for timber, fuel wood etc.

No fellings were therefore, prescribed except for meeting the demands of the right holders. Rotational grazing was recommended. 25% area of each compartment was intended to be closed for planting. Sequence of closure was prescribed but not followed. The prescriptions have been simply ignored on the pretext of one reason or the other.

7.9.16 The Khair Overlapping Working Circle:- All the areas where Khair occurred either in pure patches or mixed with other species included in 'The Khair Overlapping Working Circle'. The said working circle overlapped all the other working circles except protection working circle. The main objects of management were:-

i. To exploit mature and over mature Khair trees.

ii. To increase the proportion of Khair both by artificial and natural regeneration.

7.9.17 The management system adopted was the selection system. The exploitable diameter was fixed at 25 cm at breast height and felling cycle at 10 years. The annual yield prescribed was 450 trees with a permissible deviation of 20% 60% of trees above 25 cum d.b.h were to be felled and remaining retained for seed and protection. By the end of the year 1993-94, 5337 trees remained in arrear. The fellings in this working circle were not done in view of conservancy of forests.

7.9.18 Miscellaneous Regulations:-

a) **Fire Protection:-** Departmental control burning of chil areas has been stopped under executive order as such this important operation was ignored. The fire lines too have not been maintained as prescribed. Strict fire protection measures were enunciated for the protection of regeneration and also in the interest of resin tapping. These prescriptions were completely ignored with the result that regeneration has badly suffered and yield regulation has been put out of gear almost completely. The chil area which got burnt during the past 5 years have been indicated in para 2.11.15 and the yield deviation in chil working circle which took place due to fires has been brought out in table 5.1

b) **Resin Tapping:-** Resin tapping has been going on this division since 1937. The resin tapping was done through contractor agency till 1967. There after, it was taken up departmentally upto 1975-76 when this work was entrusted to H.P. State Forest Corporation. The rill method of resin tapping was introduced in this Division during 1989-90 resulting in to the increased yield with minimum damage to the trees.

7.10 Period 1994 to 2009:- The Working Plan for the year 1994-95 to 2008-09 was prepared by Shri P.C. Verma. The following working circles were constituted.

Sr. No.	Name of Working Circle	Area in hecatares
1.	The Chil Working Circle	5625.89

2	The Scrub Working Circle	2758.29
3.	The Plantation Working Circle	10293.67
4.	The Rehabilitation Working Circle	6022.06
	Total:	24699.91

A variation in the area statements of fuelwood Working Circle, plantation Working Circle and Protection Working Circle was observed in the areas shown in summary of areas allotted to different Working Circles and the area actually allotted and shown under the respective Working Circles. These variations are summarized as below:-

Working Circle	Area shown in summary table (Page 64 Gurmit Singh Working Plan) Hectares	Area shown in Working Circle description Hectares
Chil Working Circle	4460.30	4466.30
Fuel wood Working Circle	3401.45	3434.65
Bamboo Working Circle	908.81	908.81
Plantation Working Circle	5704.64	6340.44
Protection Working Circle	4013.24	3506.84
Grand Total:	18494.44	18657.04

Thus the total area under all Working Circles works out to be 18657.04 ha. as against 18494.44 ha. shown in Gurmit's Working Plan. This is due to variation in the actual total areas of DPFs under different Working Circles and as shown in the summary table.

7.10.1 The Chil Working Circle: This Working Circle comprised all the demarcated and undemacated protected forests in which chil occurred either pure or in fair proportion and where the locality factors permitted the system of concentrated regeneration fellings. An area of 5625.89 ha. was kept in this Working Circle out of which 30.80 ha. was RF, 3284.34 ha. was of D.P.Fs and remaining 2310.75 ha. of U.P.Fs.

7.10.2 The system of the management was Irregular Shelter Wood System, main features of which were:-

i. Compact groups of well grown poles were to be retained as part of the future crop.

ii. Where steepness of grounds inhibited the method of concentrated fellings, marking were to be done on selection principles.

7.10.3 Exploitable diameter was fixed at 60 cm d.b.h corresponding to a rotation of 120 years with four periodic blocks each of 30 years age classes. The un worked compartments of the expiring Working Plan, badly fire burnt areas, partially regenerated areas and young plantations which were not fully established and forests with overwhelming mature and over mature trees were allotted to PB II. The compartments bearing established chil regeneration of reasonable density were allotted to BP IV. All other forests which were not allotted to PB I, PB II and PB IV were allotted to PB III. Definite rules for marking were laid. Subsidiary cultural operations were prescribed.

7.10.4 In this Working Circle, two fellings were prescribed i.e. seeding fellings and final fellings. In seeding fellings every thing was prescribed to be removed from PB I areas except seed bearers and advance growth in compact groups up to 30 cm d.b.h. Healthy middle aged trees free from any defect were kept as seed bearers for the production of seed and future regeneration. N cooler aspects 15 seed bearers per hectare were to be kept. These were to be increased to 20 on warmer aspects and also to 25 on refractory areas. Thinnings were prescribed in the compact groups of advance growth and removal of over wood where the regeneration was established. In PB II no commercial fellings were prescribed. D Grade thinning were prescribed along with improvement fellings where ever these were required in PB III areas. In PB IV areas it was prescribed to remove the overhead cover along with light thinning and cleaning in the young regeneration. The above prescriptions were badly ignored during the period of the expiring working plan and defeated the very objective of the management of making the forests regular and uniform.

7.10.5 Total enumeration of all tree species had been carried out down to 10 cm d.b.h. in standard 10 cm diameter classes. The total growing stock of this working circles was 571864.31 m³. The yield was calculated by modified Von Mentel's formula.

7.10.6 The annual yield of 2000 m³ was prescribed for P.B. I for which sequence of felling was also laid down. This sequence, however, could not be adhered to because of fires and other administrative factors. Consequently yield realized from P.B. I areas was in arrears by 15611.80 m³ by the end of the year 2008-09. Similarly in case of P.B. IV where an annual yield of 700 m³ was prescribed, the yield in arrear was 223.90 m³. Against an annual yield of 2700 m³ from all PBs, the removal from all PBs was in excess

to the tune of 18319.93 m^3 by the end of 2008-09. Most of the excess removal was due to salvage removal.

7.10.7 The Scrub Working Circle: The total gross area allotted to this Working Circle is 2758.29 ha. The annual coupes of 80 ha. was prescribed to be felled during the plan period. This sequence, however, could not be adhered to because of other administrative factors.

7.10.8 The Plantation Working Circle:- All the Demarcated Protected Forests supporting inferior scrub and brushwood crops and also most of the poorly stocked un-demarcated protected forests, where economic plantations could be raised were included in this working circle. The areas where economic plantation had been raised in the past few years but were not established were also included in this working circle. Total area under this working circle was 10293.67 hectares out of which 3400.82 hectares was from DPFs and remaining 6892.85 hectares was from UPFs.

7.10.9 Most of the areas under this working circle had already been planted under one or another scheme. The survival success varies from area to area depending on the species planted and season of planting. The average survival % for Chil and Khair varies from 40 to 60 and that of other broad leaved species is less than 20. The planting programme could not be adhered to due to budgetry and other constraints.

7.10.10 The Rehabilitation Working Circle:- All the degraded forests needing improvement by vegetative and soil conservation measures and also the forests which have not been included in other Working Circles were allotted to this Working Circle. Total area of this working circle was 6022.06 ha. The annual target of 150 ha. was prescribed for treatment but due to paucity of funds the targets could not be achieved.

7.10.11 The objects of management of this Working Circle were:-

i. To protect the areas against denudation and soil erosion and to rehabilitate them by adopting vegetative and appropriate soil conservation measures.

ii. Compatible with the above, to meet the bonafide requirements of the right holders for timber, fuel wood etc.

iii. To increase the productivity and economic return from the forests of this Working Circle.

7.10.12 The Khair (Overlapping) Working Circle:- All the areas where Khair occurred either in pure patches or mixed with other species included in 'The Khair

Overlapping Working Circle'. The said working circle overlapped all the other working circles except rehabilitation working circle. The main objects of management were:-

iii. To exploit mature and over mature Khair trees.

iv. To increase the proportion of Khair both by artificial and natural regeneration.

7.10.13 The management system adopted was the selection system. The exploitable diameter was fixed at 25 cm at breast height and felling cycle at 15 years. The annual yield prescribed was 600 trees per annum with a permissible deviation of 15% which should be squared up during the following five years so that at the end of the block of 5 years the total deviation should not increase 10%.

7.10.14 **The Bamboo (Overlapping) Working Circle:-** This Working Circle overlapped all the Working Circles having bamboo bearing forests with bamboo clumps either in compact patches or occurring scattered singly in the whole area. The culms in most of the clumps are congested, broken and malformed. Regeneration of bamboo is very scanty and absent in most areas due to heavy grazing.

7.10.15 Objects of management:

- To improve the bamboo clumps by judicious cleanings and thinnings for increasing the productivity.
- To obtain maximum progressive sustained yield of bamboos from these areas.
- To regenerate bamboo areas by artificial means.
- To provide for the bonafide requirements of the local people.
- To encourage bamboos as under storey and ground cover in plantation, scrub and rehabilitation working circles.

7.10.16 **Miscellaneous Regulations:-**

a) **Fire Protection:-** Departmental control burning of chil areas has been stopped under executive order as such this important operation was ignored. The fire lines too have not been maintained as prescribed. Strict fire protection measures were enunciated for the protection of regeneration and also in the interest of resin tapping. These prescriptions were completely ignored with the result that regeneration has badly suffered and yield regulation has been put out of gear almost completely. The chil area which got burnt during the past 5 years have been indicated in para 2.11.15 and the yield deviation in chil working circle which took place due to fires has been brought out in table 7.3

Resin Tapping:- Resin tapping has been going on this division since 1937. The resin tapping was done through contractor agency till 1967. There after, it was taken up

departmentally upto 1975-76 when this work was entrusted to H.P. State Fore Corporation. The rill method of resin tapping was introduced in this Division during 1989-90 resulting in to the increased yield with minimum damage to the trees.

TABLE 7.1

Record of Resin blazes years wise and yield of resin and export			
Year	Total	Yield	Export
1994-1995	115578	4729.91	4729.91
1995-1996	119032	4811.34	4811.34
1996-1997	104944	4205.12	4205.12
1997-1998	66403	2394.96	2394.96
1998-1999	49262	1972.68	1972.68
1999-2000	43811	1749.30	1749.30
2000-2001	82218	2950.94	2950.94
2001-2002	80953	2441.54	2441.54
2002-2003	88198	3217.34	3217.34
2003-2004	87810	3423.71	3423.71
2004-2005	86282	3589.38	3589.38
2005-2006	85287	3216.23	3216.23
2006-2007	86309	3372.29	3372.29
2007-2008	86170	3415.64	3415.64
2008-2009	86170	3339.99	3339.99
2009-2010	85575	3288.65	3288.65

b) (Source: Office records of DFO Bilaspur)

c) **Roads And Paths:- Roads and Paths: -** The existing road and paths and the network of P.W.D roads reach most of the commercially important forests. All the P.W.D roads in the division are listed in Part-1 Chapter III.Forest roads and paths are

listed in Appendix D (1). No more roads are necessary. However inspection paths and their maintenance annually were prescribed in Plantations and P.B.I areas.

d) Buildings: Construction of Forest Guard Huts and BO quarters were proposed where the same were not available. Also reconstruction and improvement of Forest Guard Huts, BO quarters and Inspection huts were proposed. Details of buildings constructed w.e.f. 1994-1995 to 2008-09 are given in Appendix E.

e) Boundary Pillars: It was suggested to complete boundary pillar register and made up to date in the 1st five years of the working plan. The forward and backward bearing of boundary pillars and distance between pillars was also suggested to be recorded. The suggestions have been adhered to.

7.10.17: Past Yield: The prescriptions of the Working Plan as far as control of yield was concerned, could not be adhered to due to large scale fires, ban on Oak fellings and other conservancy reasons, thus upsetting the whole management of the forests.

7.10.18: Past Revenue And Expenditure: The revenue has decreased because no commercial fellings have been taken up during most of the years of the plan under revision. The expenditure on the other hand has increased significantly due to taking up of developmental activities for soil and water conservation in Bhakra catchment and other scheme of the department. Increase in labour rates from Rs.24.00 in 1994 to Rs.120.00 in 2011 and cost of material has also contributed to increase in expenditure. The yearwise figures of revenue and expenditure are given in Table 7.2 below.

Table – 7.2 Statement showing the revenue and expenditure w.e.f. 1994-95 to 2010-11

Year	Revenue	Non Plan	Expenditure			
			Plan State Sector	Plan Centre Sector	Capital Outlay	Total.
1994-95		N.A				
1995-96	1028074	9589143	11046409	4505280	633000	25773832
1996-97		N.A				
1997-98		N.A.				
1998-99	857765.	15792226	22465788	3155797	830000	42243811
1999-2000	2388953	13639545	25846071	1840000	521000	41846616
2001-02	6161243	18218083	18907589	3771839	330000	41227511

2002-03	6612874	18130038	19092920	1273751	390000	38886709
2003-04	118325040	34559084	19921448	3230705	567000	40278237
2004-05	230150553	40989625	3422298	4429844	250000	49091767
2005-06	279132035	43403964	14606228	10861595	2835996	71707783
2006-07	5884988	48189712	12987502	6233502	3950875	71361591
2007-08	6284630	41665568	9683673	1145231	2643300	55137772
2008-09	3591453	60610771	14048132	1341100	5685980	81685983
2009-10	46883667	69554748	8001392	1483437	5484013	84523590
2010-11	11864355	31188320	6461229	2918335	3164997	43732881

(Source: office record DFO Bilaspur)

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Bilaspur)

43732881
84523590
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TABLE : 7.3

Yield position of Bilaspur Forest Division as per Prescription of Working Plan (in m³)

Sr. No	Working Circle	Unit	P.B.	Species	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04
1	Chil	m³	I	Chil	1218.8	1600.87	859.83	851.63	770.65	1072.92	1121.11	749.44	885.32	900.37
2	Chil	m³	IV	Chil	1375.77	1573.46	877.26	345.36	554.88	611.84	621.93	868.93	332.96	342.92
3	Chil	m³	II& III	Chil	3731.45	2813.03	5576.22	2239.25	881.38	1979.40	3261.53	1704.00	1369.28	711.98
4	Scrub	Ha.			--	53	--	--	14	--	--	3.08	34.85	--
5	Plt.	Ha.			485	225	13	--	95	--	45.24	32.05	241	--
6	Rehab.				86	51	22	--	48	--	31.79	--	-NA-	--
7	Khair	Area			--	--	351.49	--	--	--	--	--	--	--
		No. of trees			--	--	376	201	471	--	--	--	--	--
8	Bamboo	Ha.			63.38	168.20	--	--	--	89.60	147.01	144.86	132.21	--
	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**Total**	**Annual Prescribed**	**Total Prescription**		**Deviation**	
1	777.87	985.88	1424.11	677.36	471.96	849.37	755.71	1417.70	17390.90	2000	36000		(-) 18609.31	
2	248.66	1024.26	1201.86	94.87	181.08	344.43	986.72	651.66	12238.91	700	12600		(-) 361.15	
3	2010.79	2479.23	2679.00	1671.37	1127.81	1389.86	2030.38	1362.77	39018.73	0	0		(+) 39018.73	
4	--	--	--	--	--	-	-	-	104.93	80	1440		(-) 1335.07	
5	--	--	--	--	--	113.00	178.00	346.58	1136.29	200	3600		(-) 2463.71	
6	--	--	--	--	--	-	--	-	238.89	150	2700		(-) 2461.11	
7	--	--	--	--	--				351.49	209.38	3768.84		(-) 3417.35	
	--	--	--	--	--				1048					
8	--	--	--	--	--	-	-	-	745.26	132.81	2390.58		(-) 1645.32	

CHAPTER-VIII

SATISTICS OF GROWTH AND YIELD

8.1 Chil: Chil is the main species on which the economics of forest working in Bilaspur Forest Division depends. The following records for its growth and yield are available.

i. Yield and volume tables for pinus longifolia by S.H. Howard, Indian Forest records, volume-XII part-V (Silviculture series).

Growth and yield statistics of common India Timber species (Himalayan region). Vol-I (1st Edition 1967) published by Forest Research Institute and Colleges Dehradun.

ii. A stand table for chir (Pinus longifolia) even aged high forest (Indian Forest Records, New series silviculture Vol. II).

8.1.1 Local statistical data for Bilaspur Chil which corresponds to average quality class III had not been collected so far. In the Working Plan under revision, FRI Volume tables for average III quality chil had been adopted. Local volume tables were prepared from General Volume tables of FRI using graphical method which was found more or less similar to that of Hamirpur Forest Division.

8.1.2 Since most of the Chil forests adjoin Hamirpur Forest Division and the crop is also similar. The local volume tables prepared in the Hamirpur Working Plan of Shri Balbir Singh have been adopted for all volume calculations in the present working plan. The volume factors for different diameter classes are as under: -

Tree Class	Diameter (Cms.)	Volume (m^3) Based on local volume tables of Hamirpur and adopted for this working plan	Volume (m^3) in the Gurmit Singh working plan under revision (based on FRI yield tables	Variation.
V	10-20	0.08	0.10	(-) 0.02
IV	20-30	0.31	0.34	(-) 0.03
III	30-40	0.85	0.81	(+) 0.04
IIA	40-50	1.58	1.60	(-) 0.02
IIB	50-60	2.55	2.73	(-) 0.18
IA	60-70	3.74	2.73	(+) 0.01
IB	70-80	4.96	2.73	(+) 2.23
IC & above.	80 cms. & above.	4.96	2.73	(+) 2.23

8.1.3 Volume increment:

Volume increment percentage for each diameter class has been derived by Pressler = s formula:

$$P = \frac{200\,V-v}{n\;V+v} \quad or \quad P = \frac{200}{n} \times \frac{V-v}{V+v}$$

Where P = Rate of volume increment percent.
v = Initial volume
V = Volume after n years.

This formula calculates increment percent as simple interest on the means of the two volumes.

As the height remains more or less constant with in short period, and assuming form factor also be constant, the volume will vary as the basal area or sequence of diameter. Therefore Pressler = s formula may be substituted by (diameter).

$$P = \frac{200}{n} \times \frac{D2-d2}{D2+d2}$$

Where d = *Initial diameter*
D = *Diameter after n years.*

To determine the volume increment percent of each diameter class, data for Age-diameter relation has been calculated as per formula below:
In Class V

d = 10 cm
D = 20 cm
n = 54 – 33 = 21 years.

$$P = \frac{200}{21} \times \frac{20-10}{20+10}$$

$$= 5.71$$

Volume increment percent for different diameter class is tabulated below:

Class	V	IV	III	IIA	IIB	IA	IB	IC	ID
Dia	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Vol. Increment percent	5.71	3.66	2.66	1.8	(1.16)	(0.76)	(0.40)	(0.16)	(0.06)

(The figures within brackets are extrapolated)

8.2 Deodar And Kail:- There is only one forest containing plantation of Deodar and Kail. As no local volume table has been prepared the volume factors of Suket Forest Division have been adopted as under:-

Tree Dia (cm)	Class	Volume in m³	
		Deodar	Kail
10-20	V	0.056	0.080
20-30	IV	0.196	0.210
30-40	III	0.756	0.590
40-50	IIA	1.568	1.230
50-60	IIB	2.639	2.550
60-70	IA	3.920	3.780
70-80	IB	5.600	5.370
80-90	IC	7.140	7.450
90 & above.	ID	7.140	7.450

8.3 Khair:- The following records are available and have been consulted:-

i. Commercial Timber (Katha) and Heartwood volume tables for Khair (Acacia catechu) in North India by H.G. Champion, and I.D. Mahendru and P.N. Suri, Indian Forest Record (Silviculture series) Vol-XIII, part IX (1929).

ii. Standard commercial and heartwood volume tables (Factory Working) for Khair (Acacia catechu) in North India by H.G. Champion, and I.D. Mahendru, Indian Forest Records (Silviculture series) Vol-XV, part III, 1931.

iii. Volume table for Acacia catechu for Katha, Howards Forest Pocket Book, 5th Edition.

8.3.1 Statistical data for Khair has not been collected locally. Plantations records from 1968-69 onwards only, are available in the division where age could be known with certainity but their location in the forest is difficult to identify as plantations in different years have been raised in the same forest or compartment. These have now merged with each other in such a way that it is difficult to separate them year-wise. It was not possible to ascertain the age of older trees found scattered in scrub forests. Because of the varying locality factors, the growth pattern in the young plantation is so heterogenous that the diameter, height data collected from these plantation did not show any definite trend or pattern.

8.3.2 The Khair found in Bilāspur Forest Division is of an average quality. Keeping in view the heterogeneous nature of the crop, the data from Pande's Working Plan for Haldwani Forest Division of U.P. has been adopted for this division also as was done in Gurmit Singh's working plan under revision.

Table – 8.1

Crop age	Average diameter (cms)	Average height (m)	No. of trees per ha.
5	(3.5)	(3.3)	many
10	(7.6)	(6.0)	many
15	(11.1)	(8.5)	583
20	(13.9)	(10.9)	514
25	(16.5)	(13.1)	445
30	(18.8)	(14.9)	385
35	(20.8)	(16.7)	331
40	22.6	18.3	287
45	24.1	19.5	252
50	25.4	20.7	227
55	26.6	31.6	203
60	(27.7)	(22.5)	188

Note:- Figures within brackets are obtained by extrapolation.

8.3.3 The figures of standing and heartwood volume of Khair and Katha obtained in the Nurpur Working Plan by Shri Nanak Chand is adopted for the current working plan. These are produced in table 6.2 Co relation between meter girth and class wise standing volume is also shown in the table. This co-relation has been worked out on the basis of following formula:

$$\frac{\text{mt. girth}}{\text{Volume}} = \frac{\pi d}{100\ V}$$

Where d is the average dia of the class in cm & V is the volume factor for that class in m^3.

Table – 8.2

Diameter (cms)	Height (m)	Standing vol. in m^3	Heartwood vol. in m^3	Wt. of heartwood for Katha (Kg.)	Wt. of Air dry Katha (Kg).	Meter girth in one m^3 standing volume
10-15	8.30	.02570	.01220	11.2	--	15.29
15-20	10.10	.06860	.03100	31.6	2.5	8.02
20-25	11.80	.118810	.05760	50.6	5.0	5.99
25-30	12.90	.16970	.10960	78.7	8.0	5.09
30-35	13.40	.25280	.17570	283.3	14.0	4.04
35-40	13.40	.33100	.24060	167.7	18.0	3.56
40-45	13.40	.43370	.30160	197.4	23.0	3.08
45-50	13.40	.54680	.38980	280.1	29.0	2.73

8.3.4 The commercial timber and heartwood in round for Khair as adopted in Pandey's Working Plan of Haldwani Division of Uttar Pradesh is given in the following table. The same is also adopted for the current Working Plan.

U.P. DATA

d.b.h cms	Commercial Timber in the round (π^2) under bark. cft.	Heartwood in the round (πr^2) cft.	Percentage
20-30	6 (0.16990 m^3)	3.9 (0.11044 m^3)	65%
30-40	14.5 (0.41059 m^3)	9.4 (0.26618 m^3)	65%
40-50	32 (0.90614 m^3)	20.8 (0.58899 m^3)	65%
50-60	52.5 (1.48663 m^3)	34.9 (0.98825 m^3)	66.5%

8.4 The existing arrangement of classification of bamboos will continue as under:-

a) **Kalan:-** Green culms measuring 5.5" (14 cm) and over in girth.

b) **Khurd:-** Green culms measuring 3.5" to 5.5" (9 cm to 14 cm) in girth.

c) **Chhari:-** Green culms measuring less than 3.5" (9 cm) in girth.

d) **Dry:-** Bamboos which have become dry.

The measurements are taken in the middle of 3rd internode from the thick end. The culms are further converted in the market sizes as given below:-

Sr. No.	Description	Length	Girth	No. of Bamboos in Bundle
1.	Chharao (Part I)	14' (4.27 m)	6" (15 cm)	5
2.	Bahi – I	6.5' (1.98 m)	5" to 6" (12.7 to 15 cm)	10
3.	Bahi – II	6.5' (1.98 m)	4" to 5" (10 to 12.7 cm)	15
4.	Majhola	6.5' (1.98 m)	3" to 4" (7.62 to 10 cm)	20
5.	Lathi	6.5' (1.98 m)	2.5" to 3" (6.35 to 7.62 cm)	30
6.	Chhari	6.5' (1.98 m)	2.5" (6.35 cm)	40
7.	Bamboo top	14' (4.27 m)	3" (7.62 cm)	10
8.	Por – II	12' (3.66 m)	2" to 3" (5.00 to 7.62 cm)	15
9.	Jhar	9' (2.74 m)	2" (5 cm)	30

8.4.1 The average dry and green weight of bamboos is given below:-

Girth (in cm)	Length class (in m)	Average Green weight per culm (kg).	Average Dry weight per culms (kg).
9.1 to 12.2	5.50 to 8.30	4.06	2.34
12.2 to 15.2	8.30 to 10.0	5.66	3.24
15.2 to 18.0	10.10 to 11.90	8.85	5.19
	Average	6.19	3.59

8.5 **Other Miscellaneous Species:-** Since the forest crop of miscellaneous species of this Forest Division is identical to that of Nahan Forest Division as such the volume factors of species like Shisham, Eucalyptus and Kokat has been adopted as mentioned in Nahan Working Plan by Shri B.S. Chauhan. The volume factors of Ban Oak has been adopted as applicable in Kunihar Forest Division. These volume factors are reproduced as under:-

DIAMETER CLASSES IN C.M.

Sr. No.	Species	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80 & above.
		V	IV	III	IIA	IIB	IA	IB	IC & above
1	Eucalyptus	0.114	0.312	0.500	0.600	0.600	0.600	0.600	0.600
2	Shisham	0.064	0.176	0.467	0.977	1.523	2.265	2.265	2.265
3	Kokat	0.064	0.184	0.418	0.885	1.515	2.294	3.193	3.193
4	Ban Oak	0.170	0.500	1.100	2.000	3.050	3.600	3.600	3.600
5	Tun	0.064	0.184	0.418	0.885	1.515	2.294	3.193	3.193
6	Mango	0.161	0.217	0.563	1.110	1.654	2.323	2.957	2.957

8.6 Fuel Wood:- Chhal (Anogiessus latifolia) and Kalam (Mitragyna parvifolia) are two species which are most liked for fuel wood. Slambra (Lannea coromandelica) and pariara (Erythrina suberosa) on the other hand are light weight species and produce poor quality fuel-wood. The fuel-wood quantity estimated on the basis of contractor's working from various classes of miscellaneous trees is as under:-

Diameter Class (d.b.h)	Quantity of Fuel wood (qtl.)	
	Compact species Chhal, Kalam etc.	Light species Slambra, Pariara etc.
IA & above.	15	8
IIB	12	6
IIA	10	5
III	6	3
IV	3	1.5
V	0.8	0.4

8.7 Charcoal:- 3.5 qtls. of dry wood of miscellaneous broad leaved trees produced 1 qtl. of charcoal. If, however, the wood is not dry, the quantity required for 1 qtl. charcoal would be 5 qtls. The estimation is based on the contractor's working in the division.

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CHAPTER-IX

ESTIMATE OF THE CAPITAL VALUE OF THE FORESTS

9.1 An estimate of the Capital Value of Forests based on the value of land and growing stock is as under:-

Sr. No.	Particulars	Unit	Total	Rate per unit (Based on 2011-12 prices	Total value in lac rupees
I	Land	ha.	26718.44	1658000	44299173520.00
II	Growing Stock	m^3			0
a)	Chil	m^3	873643.42	18630	162759.77
b)	Khair	m^3	161768.63	28813	46610.40
c)	Shisham	m^3	27742.91	23711	6578.12
d)	Other Miscellaneous B.L. Species	m^3	686720.54	6888	47301.31
	Bamboo	Bundles	21050	300	63.15
					44305751769.6
					443057.00 Lac.
				Or Say	4430.57 Crore

9.2 In above calculations, the market rates of growing stock fixed for the year 2011-12 have been applied as the rate per unit of the various species.

9.3 The capital value of the growing stock is, therefore, estimated at Rs. 4430.57 crores. In these calculations value of growing stock on private lands and UPFs not included in the working plan has not been taken into account. The value of grass, ground flora, under story and inferior species has also not been included.

PART – II

FUTURE MANAGEMENT DISCUSEED AND PRESCRIBED

CHAPTER - I

BASIS OF PROPOSALS

1.1 The National Forest Policy enunciated in 1952 was revised in 1988. This new National Forest Policy of India has laid down the following principles for the management of State Forests in the hills.

- To bring two third of the total land area under forest or tree cover in order to prevent soil erosion and land degradation and to ensure the stability of the fragile eco-system by preservation and restoration of ecological balance and conservation of natural heritage of the country.
- To meet the domestic and agricultural requirements of local population, keeping in view the carrying capacity of the forests and without harming the national interest or the interest of future generations.
- To increase the productivity of forests to meet essential national needs in perpetuity.
- To encourage efficient utilization of forest produce and maximizing substitution of wood.
- To create a massive people's movement with the involvement of all sections of society for achieving the above mentioned goal and minimizing pressure on the existing forests.

1.2 **State Forest Policy: -** The National Forest Policy enjoins the State Governments to enunciate their own Forest Policies and evolve forest management strategies to meet the peculiar forestry situation within their state within the frame work of the National Forest Policy. Accordingly, a Forest Policy for Himachal Pradesh was prepared and approved by Himachal Pradesh Government. This Forest Policy was circulated vide Department of Forest Farming and Conservation letter No.Ft.(B) 17-5/80 dated3-9-1980.

The important features of this policy are:-

i) To increase the area under forests from 39% to 50% of the total geographical area of the State by notifying the common lands and surplus lands vested with Govt under village common land (Vesting and Utilization) Act. 1974 and Land Ceiling Act 1972 under Indian Forest Act as reserved forests and density of the existing forests to make them fully stocked by 2100 AD raising plantations under a crash programme.

ii) To check over felling in forests by counting all removals towards the prescribed yield of the sanctioned working plans.

iii) To demarcate and settle the undemarcated protected forests and un classed forests under the Indian Forest Act and to remove the conflict in the admitted rights in Forest and Revenue Settlements.

iv) To rationalize and codify the rights for fuelwood, timber and minor forest produce to the right holders and make this uniform for the whole state in respect of their extent and rate.

v) To ban totally the grant of nautor and transfer of forest area, under reserved, demarcated protected forests and plantations for non forestry purposes.

vi) To undertake soil conservation works on a large scale keeping in view the strategic position of the state having the catchments of important rivers of Northern India.

vii) To ban shooting of game for the development of wild life.

viii) To raise green belts around populated areas to improve the environment and general ecology of the area.

ix) To undertake a massive programme of raising plantations of broad leaved species capable of yielding fodder, fuel, fruit and small timber with the involvement of local people on village waste lands, community lands and private or Government vacant lands.

x) To provide modern aids like wireless sets, telephones etc. to the forest staff and also to take stringent measures for the immediate detection and prevention of forest offences.

xi) To control grazing by fixing strength of herds allowed to be grazed in a forest through a comprehensive legislation.

1.3 **General Objects of Management:** - Consistent with the policy enunciated above and the State policy of bringing 50% of the geographical area of the state under green cover by the turn of this century, the general objects of management of these forests will be as under:-

i) To preserve, enhance and improve the forest cover in this hilly region in the interest of local economy, needs and prolonging the life of Sutlej River Valley Projects by reducing the silt load in the river flow.

ii) To provide for the domestic and agricultural requirements of the local people for timber, fuelwood, grazing and other forest produce.

iii) To bring the growing stock of forests to a condition as near to that of a normal forest as possible in respect of regeneration, density and distribution of age classes during the plan period.

iv) To gradually introduce more valuable species like Chil, Khair and Bamboo in the forests presently under scrub and other inferior species.

v) To produce maximum possible sustained yield of timber, resin, bamboos and other forest products in demand in the market consistent with the principles of sound silvicultural management of forest.

vi) To help conservation of natural environment, and biodiversity.

1.4 Methods of Treatment to be Adopted: - In order to attain the objects of management, the following working circles have been constituted.

1) The Chil Working Circle.
2) The Plantation Working Circle.
3) The Protection Working Circle.
4) The Khair (Overlapping) Working Circle.
5) The Bamboos (Overlapping) Working Circle.
6) The JFM (Overlapping) Working Circle.
7) The Wildlife Conservation (Overlapping) Working Circle.
8) The Soil and Water Conservation (Overlapping) Working Circle.
9) The NTFP (Overlapping) Working Circle.

1.5 The Working Circles, their areas and distribution:-

I. **The Chil Working Circle:** - All the reserved, demarcated protected and undemarcated protected forests in which Chil occurs either pure or in a fair proportion or where Chil plantations have been established and where conditions of terrain are suited for the application of concentrated regeneration fellings, have been allotted to this working circle. These forests will be managed under the Irregular Shelter Wood System.

II. **The Plantation Working Circle:** - All the forests which are either blanks or un-economical for working but fit for raising plantations have been included in this working circle. The areas where economic plantations have been raised in the past few years but not yet established have also been included in this working circle.The areas of the rehabilitation working of the previous working plan under revision have also been included in this working circle.

1II. The Khair (Over Lapping) Working Circle: - This working circle over laps the Khair bearing areas included in other working circles and has been formed to harvest mature Khair trees under selection system.

IV. The Bamboos (Over lapping) Working Circle: - For the management of bamboo bearing areas though allotted to Other working circles an over lapping working constituted where bamboo crop will not only be harvested on selection system but also improved

V The protection working circle:- The areas of scrub working circle of the previous working plan under revision have also been included in this working circle.. This working circle includes all the forests which are located on steep to precipitous slopes, on broken terrain comprising conifers, ban or open crop of broad leaved species which was subjected to indiscriminate hacking in the past and requires rest for recuperation. These forests are mainly situated on difficult, precipitous and erodible terrains and form the catchments perennial streams. It also includes such areas as are situated on difficult terrains and warrant protection from future degradation. In addition areas having problems like invasive alien species; frequent fires, encroachment, illicit felling etc have also been included in this Working Circle.

VI The JFM (Overlapping) Working Circle

This working circle includes the forest areas near the habitations where active participation of the local people has been taken in the past along with potential new areas. The experience gained from social forestry, ODA, DFID, SVY projects have been incorporated to enlist the potential *panchayats* /villages where JFPM approach can be successfully implemented.The selected forest areas are mostly DPFs situated near habitations that have become degraded, UPFs and wasteland that are in small bits, honeycombed, surrounded by cultivation and are left out after demarcation and settlement.

VII The Wildlife Conservation (Overlapping) Working Circle.

It is an overlapping working circle and the management plan for preserving existing wild life is prepared. The provisions of Wild life Protection Act, 1972 are to be enforced and the man-animal conflict reduced.

VIII Soil And Water Conservation (Overlapping) Working Circle.

This is overlapping working circle. The areas which are prone to erosion & land slides & need special attention for treatment under the siol conservation have been included in this working circle. The areas included in this working circles are given as below:-

S.No	Name of Range	Beat	Name of Forest	Area
1	Bharai	Nihari	C10 Nihari	23.20
		Maryani	C5b Tiamblo	29.60
		Kamloti	C2a Kamloti	60.40
		Kamloti	C3c Chokna	24.00
		Mohra	DPF Karloti I	8.13
		Badahaghat	C13 a BadaGhat	28.40
		Badahaghat	C15 Doon	24.80
		Hatwar	DPF Hatwar	1.68
		Hatwar	DPF Kotlu	1.00
		Bharari	DPF Barog	6.63
		Bharari	DPF Lanjta I	2.79
		Bharari	DPF Thandora	3.92
	Jhandutta	Dhad	C8 g Dafer	15.80
		Dhad	DPF Dahad	17.34
		Dhad	DPF Tikkri III	2.39
		Thuran	DPF Rachhera	31.34
		Dhad	DPF Kalshai I	1.65
		Dhad	C6 B Mekhwin	3.70
		Jhaula	C7 Jhaula	24.00
		Barthin	DPF Ree	10.67
	Sadar	Jamthal	DPF Jamthal Cia	61.80
		Chamyoun	DPF Chamyoun C2a	100.20
		Markand	UPF Mangrot I	40.74
		Kuddi	DPF Buryans C5b	90.00
		Kuddi	DPF Brathu I	2.60
		Deoth	UPF Bhajoon	62.42
		Namhol	DPF NiharKhan Basla	17.56
		Namhol	DPF Dagsach	19.43
		Binola	UPF Binola	2.29
	Ghumarwin	Dhangoo	C4 Ghan	166.80

		Dhangoo	C1 Umri	47.20
		Pannoul	CI Osal jaman	62.40
		Pannoul	DPF Amarpur III	12.34
		Harlog	C5 b Harlog	32.40
		Takrera	DPF Rohan I	2.03
		Takrera	DPF Roain II	5.11
		Sadyar	C18 Sadyar	121.20
		Ghumarwin	DPF Badota	21.93
		Paniala	DPF Raw I	8.45

IX The NTFP (Overlapping) Working Circle: This overlapping working circle is to preserve and improve the quantity and quality of NTFPs and to preserve & develop the resource base for food security of wildlife in the division and manage them on a sustainable basis.

1.5.1 The following Table 1.1, summarizes the areas allotted to different working circles by ranges and blocks.

TABLE 1.1

WORKING CIRCLE WISE AREA IN HECTARES

Sr. No.	Name of Range	Name of Block	CHIL WORKING CIRCLE			
			R.F.	D.P.F.	U.P.F.	Total
1	Bharari	Bharari	0.00	132.77	0.00	132.77
		Mohra	0.00	0.00	0.00	0.00
		Nihari	0.00	691.22	50.26	741.48
		Total:	**0.00**	**823.99**	**50.26**	**874.25**
2	Ghumarwin	Ghumarwin	0.00	184.62	52.99	237.61
		Harlog	0.00	96.18	43.38	139.56
		Paniyala	0.00	232.47	1.94	234.41
		Total:	**0.00**	**513.27**	**98.31**	**611.58**
3	Jhandutta	Gochar	0.00	971.00	0.68	971.68
		Jhandutta	0.00	261.31	0.00	261.31
		Samoh	0.00	414.72	51.78	466.50

		Total:	**0.00**	**1647.03**	**52.46**	**1699.49**
4	**Kalol**	Bachhretu	0.00	0.00	0.00	0.00
		Kalol	0.00	90.24	0.00	90.24
		Malhot	0.00	147.33	33.11	180.44
		Total:	**0.00**	**237.57**	**33.11**	**270.68**
5	**Sadar**	Brahampukhar	30.80	45.50	91.84	168.14
		Panjgain	0.00	61.80	0.00	61.80
		Sadar	0.00	0.00	0.00	0.00
		Total:	**30.80**	**107.30**	**91.84**	**229.94**
6	**Swarghat**	Bassi	0.00	0.00	0.00	0.00
		Bhakra	0.00	0.00	0.00	0.00
		Rattanpur	0.00	40.00	580.90	620.90
		Swahan	0.00	0.00	197.28	197.28
		Swarghat	0.00	451.60	692.09	1143.69
		Total:	**0.00**	**491.60**	**1470.27**	**1961.87**
	Grand Total: Chil Working Circle:		**30.80**	**3820.76**	**1796.25**	**5647.81**

Sr. No.	Name of Range	Name of Block	PROTECTION WORKING CIRCLE			
			R.F.	D.P.F.	U.P.F.	Total
1	**Bharari**	Bharari	0.00	3.92	0.00	3.92
		Mohra	0.00	0.00	2.08	2.08
		Nihari	0.00	0.00	0.00	0.00
		Total	**0.00**	**3.92**	**2.08**	**6.00**
2	**Ghumarwin**	Ghumarwin	0.00	21.07	2.98	24.05
		Harlog	0.00	116.09	13.93	130.02
		Paniyala	0.00	17.88	29.50	47.38
		Total:	**0.00**	**155.04**	**46.41**	**201.45**
3	**Jhandutta**	Gochar	0.00	89.86	0.67	90.53
		Jhandutta	0.00	22.90	0.00	22.90
		Samoh	0.00	44.69	0.00	44.69
		Total:	**0.00**	**157.45**	**0.67**	**158.12**
4	**Kalol**	Bachhretu	0.00	413.16	488.85	902.01
		Kalol	0.00	997.67	28.78	1026.45
		Malhot	0.00	547.42	49.54	596.96

		Total:	**0.00**	**1958.25**	**567.17**	**2525.42**
5	**Sadar**	Brahampukhar	0.00	39.20	0.00	39.20
		Panjgain	0.00	0.00	32.71	32.71
		Sadar	0.00	13.80	8.62	22.42
		Total:	**0.00**	**53.00**	**41.33**	**94.33**
6	**Swarghat**	Bassi	0.00	0.00	408.73	408.73
		Bhakra	0.00	0.00	592.20	592.20
		Rattanpur	0.00	0.00	0.00	0.00
		Swahan	0.00	0.00	0.00	0.00
		Swarghat	0.00	0.00	23.37	23.37
		Total:	**0.00**	**0.00**	**1024.30**	**1024.30**
	Grand Total Prot. WC:		**0.00**	**2327.66**	**1681.96**	**4009.62**

Sr. No.	Name of Range	Name of Block	PLANTATION WORKING CIRCLE			
			R.F.	D.P.F.	U.P.F.	Total
1	**Bharari**	Bharari	0.00	21.92	11.00	32.92
		Mohra	0.00	276.74	204.97	481.71
		Nihari	0.00	10.01	0.00	10.01
		Total:	**0.00**	**308.67**	**215.97**	**524.64**
2	**Ghumarwin**	Ghumarwin	0.00	481.15	149.53	630.68
		Harlog	0.00	882.87	180.22	1063.09
		Paniyala	0.00	227.16	56.59	283.75
		Total:	**0.00**	**1591.18**	**386.34**	**1977.52**
3	**Jhandutta**	Gochar	0.00	122.17	49.67	171.84
		Jhandutta	0.00	327.09	31.93	359.02
		Samoh	0.00	655.05	81.74	736.79
		Total:	**0.00**	**1104.31**	**163.34**	**1267.65**
4	**Kalol**	Bachhretu	0.00	273.04	514.82	787.86
		Kalol	0.00	230.31	430.62	660.93
		Malhot	0.00	622.08	284.34	906.42
		Total:	**0.00**	**1125.43**	**1229.78**	**2355.21**
5	**Sadar**	Brahampuk	58.80	214.78	225.32	498.90

		har				
		Panjgain	0.00	1066.92	1355.30	2422.22
		Sadar	0.00	1305.79	529.15	1834.94
		Total:	**58.80**	**2587.49**	**2109.77**	**4756.06**
6	**Swarghat**	Bassi	0.00	0.00	1288.50	1288.50
		Bhakra	0.00	0.00	2189.62	2189.62
		Rattanpur	0.00	59.58	810.35	869.93
		Swahan	0.00	92.40	1054.22	1146.62
		Swarghat	0.00	101.60	583.66	685.26
		Total:	**0.00**	**253.58**	**5926.35**	**6179.93**
	Grand Total Plantation WC:		**58.80**	**6970.66**	**10031.55**	**17061.01**

		ABSTRACT (TOTAL AREA OF BILASPUR DIVISION)				
			R.F.	**D.P.F.**	**U.P.F.**	**Total**
			89.60	**13119.08**	**13509.76**	**26718.44**

1.6 Blocks and Compartment: - The names of individual forests and blocks of forests have been retained. In all there are 20 blocks which have been further sub-divided into compartments and sub compartments which have been given a serial number and name adopted after the locality in which the compartment is situated. For example Fatehpur Cla Swarghat indicates sub-compartment 1a of Fatehpur block situated at or near Swarghat. Three compartments which have been submerged in Gobind Sagar or allotted to Bhakra Dam and Barmana Cement plant oustees and consequently denotified have been deleted but the numbering of the rest of the compartments in the block has not been changed to avoid confusion. Sub division of Fatehpur C 1 Swarghat has been done into two sub compartments viz. Fatehpur C 1a, and C 1b. Swarghat from management point of view. The new DPFs numbering 337 which have been notified up to 27.11.1995 from UPFs have been given serial number of the compartment or sub compartment according to their location in the particular forest block. All the compartment and sub compartments are well distinguished in the field by natural features or otherwise. The list of new DPFs is given as below in Table 1.6:

TABLE 1.6					
LIST OF FORESTS NOTIFIED AS DPFs BILASPUR FOREST DIVISION: (NEW DPFs)					
Sr. No.	*Name of Range*	*Name of Forest*	*Area in Hac.*	Notification No.	*Date*
1	Ghumarwin	Tiun-I	1.93	No.Fts(F)5-3/92	25.5.1995
2	Jhandutta	Tihri	3.92	No.Fts(F)5-3/92	25.5.1995
3	Ghumarwin	Gatol	28.22	No.Fts(F)5-3/92	25.5.1995
4	Ghumarwin	Barota-II	2.51	No.Fts(F)5-3/92	25.5.1995
5	Kalol	Bhagatpur	2.15	No.Fts(F)5-3/92	25.5.1995
6	Jhandutta	Kuthera	18.21	No.Fts(F)5-3/92	25.5.1995
7	Jhandutta	Jajar	3.13	No.Fts(F)5-3/92	25.5.1995
8	Jhandutta	Jhabola-II	55.16	No.Fts(F)5-3/92	25.5.1995
9	Jhandutta	Samoh-I	5.52	No.Fts(F)5-3/92	25.5.1995
10	Jhandutta	Samoh-II	5.52	No.Fts(F)5-3/92	25.5.1995
11	Jhandutta	Tikari-I	25.56	No.Fts(F)5-3/92	25.5.1995
12	Jhandutta	Tikari-II	6.44	No.Fts(F)5-3/92	25.5.1995
13	Jhandutta	Tikari-III	2.39	No.Fts(F)5-3/92	25.5.1995
14	Jhandutta	Jangla-I	2.28	No.Fts(F)5-3/92	25.5.1995
15	Jhandutta	Jangla-II	8.09	No.Fts(F)5-3/92	25.5.1995
16	Jhandutta	Jangla-III	22.11	No.Fts(F)5-3/92	25.5.1995
17	Jhandutta	Badol-I	6.61	No.Fts(F)5-3/92	25.5.1995
18	Jhandutta	Badol-II	5.67	No.Fts(F)5-3/92	25.5.1995
19	Sadar	Sai Brahmna I	1.81	No.Fts(F)5-3/92-D	25.5.1995
20	Sadar	Bhadetar-III	2.71	No.Fts(F)5-3/92-D	25.5.1995
21	Sadar	Bhadetar-II	11.63	No.Fts(F)5-3/92-D	25.5.1995
22	Sadar	Tikari	2.32	No.Fts(F)5-3/92-D	25.5.1995
23	Bharari	Thandoda	3.92	No.Fts(F)5-3/92-D	25.5.1995
24	Bharari	Lehri Sarel	3.63	No.Fts(F)5-3/92-D	25.5.1995
25	Bharari	Lanjhta	2.80	No.Fts(F)5-3/92-D	25.5.1995
26	Ghumarwin	Rali-III	2.84	No.FFE-B(F)5-6/94	25.5.1995
27	Jhandutta	Kallar	13.56	No.FFE-B(F)5-6/94	25.5.1995

28	Jhandutta	Behran-I	3.73	No.FFE-B(F)5-6/94	25.5.1995
29	Jhandutta	Behran-II	19.82	No.FFE-B(F)5-6/94	25.5.1995
30	Jhandutta	Behran-III	10.81	No.FFE-B(F)5-6/94	25.5.1995
31	Jhandutta	Amroha-I	3.74	No.FFE-B(F)5-6/94	25.5.1995
32	Jhandutta	Amroha-II	8.38	No.FFE-B(F)5-6/94	25.5.1995
33	Jhandutta	Lehar-I	5.26	No.FFE-B(F)5-6/94	25.5.1995
34	Jhandutta	Lehar-II	4.31	No.FFE-B(F)5-6/94	25.5.1995
35	Jhandutta	Lehar-III	2.11	No.FFE-B(F)5-6/94	25.5.1995
36	Jhandutta	Nahral	2.48	No.FFE-B(F)5-6/94	25.5.1995
37	Jhandutta	Nand-I	5.61	No.FFE-B(F)5-6/94	25.5.1995
38	Jhandutta	Nand-II	4.14	No.FFE-B(F)5-6/94	25.5.1995
39	Jhandutta	Nand-III	3.90	No.FFE-B(F)5-6/94	25.5.1995
40	Jhandutta	Rohal-I	6.76	No.FFE-B(F)5-6/94	25.5.1995
41	Jhandutta	Rohal-II	13.30	No.FFE-B(F)5-6/94	25.5.1995
42	Jhandutta	Rohal-III	1.54	No.FFE-B(F)5-6/94	25.5.1995
43	Jhandutta	Rohal-IV	1.38	No.FFE-B(F)5-6/94	25.5.1995
44	Jhandutta	Dharad-I	3.54	No.FFE-B(F)5-6/94	25.5.1995
45	Jhandutta	Dharad-II	3.43	No.FFE-B(F)5-6/94	25.5.1995
46	Jhandutta	Bhadol-I	1.99	No.FFE-B(F)5-6/94	25.5.1995
47	Jhandutta	Bhadol-II	1.18	No.FFE-B(F)5-6/94	25.5.1995
48	Jhandutta	Parahu-I	33.48	No.FFE-B(F)5-6/94	25.5.1995
49	Jhandutta	Nagraon	2.13	No.FFE-B(F)5-6/94	25.5.1995
50	Jhandutta	Salasi	7.20	No.Fts(F)5-23/92	27.5.95
51	Sadar	Dhamna	31.70	No.Fts(F)5-23/93	27.5.95
52	Sadar	Bandla-I	65.93	No.Fts(F)5-23/93	27.5.95
53	Sadar	Bandla-II	98.60	No.Fts(F)5-23/93	27.5.95
54	Sadar	Bandla-III	64.45	No.Fts(F)5-23/93	27.5.95
55	Sadar	Bandla-IV	2.02	No.Fts(F)5-23/93	27.5.95
56	Sadar	Bandla-V	1.57	No.Fts(F)5-23/93	27.5.95
57	Sadar	Karot-I	84.94	No.Fts(F)5-23/93	27.5.95
58	Sadar	Karot-II	9.24	No.Fts(F)5-23/93	27.5.95

59	Ghumarwin	Row-I	11.77	No.Fts(F)5-23/93	27.5.95
60	Ghumarwin	Balhu-Kharyala	4.39	No.Fts(F)5-23/93	27.5.95
61	Ghumarwin	Dadhol Kalan-II	2.22	No.Fts(F)5-23/93	27.5.95
62	Ghumarwin	Panol-II	3.92	No.Fts(F)5-23/93	27.5.95
63	Ghumarwin	Rachhera-II	1.60	No.Fts(F)5-23/93	27.5.95
64	Ghumarwin	Rachhera-III	6.00	No.Fts(F)5-23/93	27.5.95
65	Ghumarwin	Panoh	4.29	No.Fts(F)5-23/93	27.5.95
66	Jhandutta	Malari -III	12.88	No.Fts(F)5-23/93	27.5.95
67	Jhandutta	Changar Talai	30.03	No.Fts(F)5-23/93	27.5.95
68	Jhandutta	Malangan-II	22.36	No.Fts(F)5-23/93	27.5.95
69	Kalol	Bakain-I	6.42	No.Fts(F)5-23/93	27.5.95
70	Kalol	Bakain-II	5.72	No.Fts(F)5-23/93	27.5.95
71	Kalol	Bakain-III	2.65	No.Fts(F)5-23/93	27.5.95
72	Kalol	Bakain-IV	5.00	No.Fts(F)5-23/93	27.5.95
73	Kalol	Bakain-V	1.84	No.Fts(F)5-23/93	27.5.95
74	Kalol	Malangan-I	13.98	No.Fts(F)5-3/93	29.5.95
75	Kalol	Malari -II	6.11	No.Fts(F)5-3/93	29.5.95
76	Bharari	Jarora-I	3.51	No.Fts(F)5-3/93	29.5.95
77	Bharari	Jarora-II	1.86	No.Fts(F)5-3/93	29.5.95
78	Ghumarwin	Row-II	2.45	No.Fts(F)5-3/93	29.5.95
79	Ghumarwin	Panol-III	12.63	No.Fts(F)5-3/93	29.5.95
80	Ghumarwin	Panol-I	14.39	No.Fts(F)5-3/93	29.5.95
81	Ghumarwin	Takrera-II	2.41	No.Fts(F)5-3/93	29.5.95
82	Jhandutta	Kharota	2.63	No.Fts(F)5/7/94	30.5.95
83	Jhandutta	Dolalsvan-I	3.85	No.Fts(F)5/7/94	30.5.95
84	Jhandutta	Dolalsvan-II	28.76	No.Fts(F)5/7/94	30.5.95
85	Jhandutta	Sangasin	12.06	No.Fts(F)5/7/94	30.5.95
86	Jhandutta	Thurahan-I	6.49	No.Fts(F)5/7/94	30.5.95
87	Jhandutta	Thurahan-III	9.06	No.Fts(F)5/7/94	30.5.95
88	Jhandutta	Thurahan-II	7.69	No.Fts(F)5/7/94	30.5.95
89	Jhandutta	Poli-I	15.39	No.Fts(F)5/7/94	30.5.95

90	Jhandutta	Poli-II	3.60	No.Fts(F)5/7/94	30.5.95
91	Jhandutta	Poli-III	5.25	No.Fts(F)5/7/94	30.5.95
92	Jhandutta	Poli-IV	0.98	No.Fts(F)5/7/94	30.5.95
93	Jhandutta	Kohina-I	9.23	No.Fts(F)5/7/94	30.5.95
94	Jhandutta	Kohina-II	4.58	No.Fts(F)5/7/94	30.5.95
95	Kalol	Chalava	8.00	No.Fts(F)5/7/94	30.5.95
96	Kalol	Jejwin	6.48	No.Fts(F)5/7/94	30.5.95
97	Kalol	Behtri	30.12	No.Fts(F)5/7/94	30.5.95
98	Kalol	Suh-I	26.85	No.Fts(F)5/7/94	30.5.95
99	Kalol	Suh-II	1.31	No.Fts(F)5/7/94	30.5.95
100	Kalol	Droh	8.68	No.Fts(F)5/7/94	30.5.95
101	Kalol	Tihri -I	32.20	No.Fts(F)5/7/94	30.5.95
102	Kalol	Tihri-II	5.04	No.Fts(F)5/7/94	30.5.95
103	Bharari	Sandyar	5.25	No.Fts(F)5/7/94	30.5.95
104	Ghumarwin	Rohin-I	2.03	No.Fts(F)5/7/94	30.5.95
105	Ghumarwin	Rohin-II	5.12	No.Fts(F)5/7/94	30.5.95
106	Ghumarwin	Rohin-III	2.72	No.Fts(F)5/7/94	30.5.95
107	Ghumarwin	Rohin-IV	1.29	No.Fts(F)5/7/94	30.5.95
108	Ghumarwin	Rohin-V	6.05	No.Fts(F)5/7/94	30.5.95
109	Ghumarwin	Rohin-VI	4.00	No.Fts(F)5/7/94	30.5.95
110	Ghumarwin	Rohin-VII	3.92	No.Fts(F)5/7/94	30.5.95
111	Ghumarwin	Bhanglehra-I	2.92	No.Fts(F)5/7/94	30.5.95
112	Ghumarwin	Bhanglehra-II	6.71	No.Fts(F)5/7/94	30.5.95
113	Ghumarwin	Bhanglehra-III	2.32	No.Fts(F)5/7/94	30.5.95
114	Ghumarwin	Amarpur-I	25.54	No.Fts(F)5/7/94	30.5.95
115	Ghumarwin	Amarpur-II	25.26	No.Fts(F)5/7/94	30.5.95
116	Ghumarwin	Amarpur-III	12.34	No.Fts(F)5/7/94	30.5.95
117	Bharari	Panyala-I	7.61	No.Fts(F)5/7/94	30.5.95
118	Bharari	Panyala-III	6.50	No.Fts(F)5/7/94	30.5.95
119	Bharari	Panyala-II	7.93	No.Fts(F)5/7/94	30.5.95
120	Bharari	Doon-IV	4.60	No.Fts(F)5/7/94	30.5.95

121	Sadar	Jinnu	3.03	No.Fts(F)5/7/94	30.5.95
122	Sadar	Sandoli-I	6.47	No.Fts(F)5/7/94	30.5.95
123	Sadar	Sandoli-II	2.78	No.Fts(F)5/7/94	30.5.95
124	Bharari	Doon-I	3.48	No.FFE-B(F)9-3/95	26.9.95
125	Bharari	Doon-II	4.91	No.FFE-B(F)9-3/95	26.9.95
126	Bharari	Doon-III	2.77	No.FFE-B(F)9-3/95	26.9.95
127	Bharari	Doon-V	2.85	No.FFE-B(F)9-3/95	26.9.95
128	Ghumarwin	Mohin-I	4.12	No.FFE-B(F)9-3/95	26.9.95
129	Ghumarwin	Mohin-II	9.97	No.FFE-B(F)9-3/95	26.9.95
130	Bharari	Taraun	2.30	No.FFE-B(F)9-3/95	26.9.95
131	Bharari	Barota	1.63	No.FFE-B(F)9-3/95	26.9.95
132	Bharari	Lanjhta	1.16	No.FFE-B(F)9-3/95	26.9.95
133	Bharari	Haritalyangar-III	2.27	No.FFE-B(F)9-3/95	26.9.95
134	Bharari	Chandoh	1.28	No.FFE-B(F)9-3/95	26.9.95
135	Ghumarwin	Chalehli-I	4.04	No.FFE-B(F)9-3/95	26.9.95
136	Ghumarwin	Chalehli-II	2.43	No.FFE-B(F)9-3/95	26.9.95
137	Ghumarwin	Palti	11.46	No.FFE-B(F)9-3/95	26.9.95
138	Ghumarwin	Kseh	5.35	No.FFE-B(F)9-3/95	26.9.95
139	Kalol	Bhadoli Khurd	10.54	No.FFE-B(F)9-3/95	26.9.95
140	Kalol	Jhreri-I	4.85	No.FFE-B(F)9-3/95	26.9.95
141	Kalol	Jhreri-II	7.05	No.FFE-B(F)9-3/95	26.9.95
142	Kalol	Jhreri-III	2.06	No.FFE-B(F)9-3/95	26.9.95
143	Sadar	Binola-II	43.15	No.FFE-B(F)9-3/95	26.9.95
144	Sadar	Parnali-I	114.61	No.FFE-B(F)9-3/95	26.9.95
145	Sadar	Parnali-II	8.28	No.FFE-B(F)9-3/95	26.9.95
146	Sadar	Ghial-I	6.22	No.FFE-B(F)9-3/95	26.9.95
147	Sadar	Ghial-II	1.29	No.FFE-B(F)9-3/95	26.9.95
148	Sadar	Belna Brahmna	9.33	No.FFE-B(F)9-3/95	26.9.95
149	Sadar	Luhnu Kanaita -I	1.72	No.FFE-B(F)9-3/95	26.9.95
150	Sadar	Luhnu Kanaita - II	2.56	No.FFE-B(F)9-3/95	26-9-95

151	Sadar	Lunnu Kanaita-III	6.60	No.FFE-B(F)9-3/95	26.9.95
152	Sadar	Deoli- I	16.39	No.FFE-B(F)9-3/95	26.9.95
153	Sadar	Deoli- II	4.74	No.FFE-B(F)9-3/95	26.9.95
154	Sadar	Deoli-III	3.56	No.FFE-B(F)9-3/95	26.9.95
155	Sadar	Deoli-IV	15.81	No.FFE-B(F)9-3/95	26.9.95
156	Sadar	Barog-I	3.78	No.FFE-B(F)9-3/95	26.9.95
157	Sadar	Barog-II	40.36	No.FFE-B(F)9-3/95	26.9.95
158	Jhandutta	Fagog-I	10.51	No.FFE-B(F)9-3/95	26.9.95
159	Jhandutta	Fagog-II	2.02	No.FFE-B(F)9-3/95	26.9.95
160	Jhandutta	Balhsina -I	37.66	No.FFE-B(F)9-3/95	26.9.95
161	Jhandutta	Balhsina -II	28.52	No.FFE-B(F)9-3/95	26.9.95
162	Jhandutta	Balhsina -III	10.89	No.FFE-B(F)9-3/95	26.9.95
163	Jhandutta	Balhsina -IV	3.17	No.FFE-B(F)9-3/95	26.9.95
164	Sadar	Sungal	34.05	No.FFE(F)5-1/95	27.11.1995
165	Sadar	Kuhal kattal	5.39	No.FFE(F)5-1/95	27.11.1995
166	Sadar	Pohni-I	9.22	No.FFE(F)5-1/95	27.11.1995
167	Sadar	Pohni-II	4.90	No.FFE(F)5-1/95	27.11.1995
168	Sadar	Makri-I	3.96	No.FFE(F)5-1/95	27.11.1995
169	Sadar	Makri-II	3.56	No.FFE(F)5-1/95	27.11.1995
170	Sadar	Dalta	1.90	No.FFE(F)5-1/95	27.11.1995
171	Sadar	Gutrahan-I	10.37	No.FFE(F)5-1/95	27.11.1995
172	Sadar	Gutrahan-II	3.53	No.FFE(F)5-1/95	27.11.1995
173	Sadar	Gutrahan-III	4.73	No.FFE(F)5-1/95	27.11.1995
174	Sadar	Kharsi Kanaita -I	1.20	No.FFE(F)5-1/95	27.11.1995
175	Sadar	Kharsi Kanaita -II	7.66	No.FFE(F)5-1/95	27.11.1995
176	Sadar	Kharsi Kanaita-III	1.42	No.FFE(F)5-1/95	27.11.1995
177	Sadar	Kharsi Kanaita -IV	3.24	No.FFE(F)5-1/95	27.11.1995
178	Sadar	Thohru-I	21.60	No.FFE(F)5-1/95	27.11.1995
179	Sadar	Thohru-II	4.38	No.FFE(F)5-1/95	27.11.1995
180	Sadar	Thohru-III	1.70	No.FFE(F)5-1/95	27.11.1995

181	Sadar	Lungari Kanetan	17.28	No.FFE(F)5-1/95	27.11.1995
182	Sadar	Chamlog	1.96	No.FFE(F)5-1/95	27.11.1995
183	Sadar	Deoli - V	2.56	No.FFE(F)5-1/95	27.11.1995
184	Sadar	Manjher-I	4.74	No.FFE(F)5-1/95	27.11.1995
185	Sadar	Manjher-II	19.14	No.FFE(F)5-1/95	27.11.1995
186	Sadar	Kamlota	2.27	No.FFE(F)5-1/95	27.11.1995
187	Sadar	Sangrana-I	7.34	No.FFE(F)5-1/95	27.11.1995
188	Sadar	Sumari-I	19.31	No.FFE(F)5-1/95	27.11.1995
189	Sadar	Sumari-II	1.43	No.FFE(F)5-1/95	27.11.1995
190	Sadar	Sumari-III	1.35	No.FFE(F)5-1/95	27.11.1995
191	Sadar	Bag Khurd	3.65	No.FFE(F)5-1/95	27.11.1995
192	Sadar	Kanjota	1.02	No.FFE(F)5-1/95	27.11.1995
193	Sadar	Kathpur	1.38	No.FFE(F)5-1/95	27.11.1995
194	Sadar	Mangrot-I	40.75	No.FFE(F)5-1/95	27.11.1995
195	Sadar	Mangrot-II	16.68	No.FFE(F)5-1/95	27.11.1995
196	Sadar	Baggi	20.27	No.FFE(F)5-1/95	27.11.1995
197	Sadar	Kahli	6.24	No.FFE(F)5-1/95	27.11.1995
198	Sadar	Soshan-I	3.18	No.FFE(F)5-1/95	27.11.1995
199	Sadar	Soshan-II	2.85	No.FFE(F)5-1/95	27.11.1995
200	Sadar	Soshan-III	1.03	No.FFE(F)5-1/95	27.11.1995
201	Sadar	Bhandoh	2.10	No.FFE(F)5-1/95	27.11.1995
202	Sadar	Dagsech-I	2.73	No.FFE(F)5-1/95	27.11.1995
203	Sadar	Dagsech-II	2.94	No.FFE(F)5-1/95	27.11.1995
204	Sadar	Dagsech-III	13.94	No.FFE(F)5-1/95	27.11.1995
205	Sadar	Palog-I	7.73	No.FFE(F)5-1/95	27.11.1995
206	Sadar	Palog-II	2.99	No.FFE(F)5-1/95	27.11.1995
207	Sadar	Palog-III	3.04	No.FFE(F)5-1/95	27.11.1995
208	Sadar	Dadog-I	1.46	No.FFE(F)5-1/95	27.11.1995
209	Sadar	Dadog-II	1.32	No.FFE(F)5-1/95	27.11.1995
210	Sadar	Kotla	2.12	No.FFE(F)5-1/95	27.11.1995
211	Jhandutta	Parahoo-II	5.35	No.FFE(F)5-1/95	27.11.1995

212	Jhandutta	Mushahn	3.24	No.FFE(F)5-1/95	27.11.1995
213	Jhandutta	Tihri-I	3.48	No.FFE(F)5-1/95	27.11.1995
214	Jhandutta	Tihri-II	2.46	No.FFE(F)5-1/95	27.11.1995
215	Jhandutta	Khalsai-I	2.69	No.FFE(F)5-1/95	27.11.1995
216	Jhandutta	Khalsai-II	1.66	No.FFE(F)5-1/95	27.11.1995
217	Jhandutta	Khalsai-III	7.80	No.FFE(F)5-1/95	27.11.1995
218	Jhandutta	Khalsai-IV	7.28	No.FFE(F)5-1/95	27.11.1995
219	Jhandutta	Rachera-I	31.35	No.FFE(F)5-1/95	27.11.1995
220	Jhandutta	Rachera-II	4.17	No.FFE(F)5-1/95	27.11.1995
221	Jhandutta	Surhar-I	20.10	No.FFE(F)5-1/95	27.11.1995
222	Jhandutta	Surhar-II	7.09	No.FFE(F)5-1/95	27.11.1995
223	Jhandutta	Matla-I	3.15	No.FFE(F)5-1/95	27.11.1995
224	Jhandutta	Matla-II	2.63	No.FFE(F)5-1/95	27.11.1995
225	Jhandutta	Dari Bhari-I	2.57	No.FFE(F)5-1/95	27.11.1995
226	Jhandutta	Balgarh-I	3.48	No.FFE(F)5-1/95	27.11.1995
227	Jhandutta	Balgarh-II	7.26	No.FFE(F)5-1/95	27.11.1995
228	Jhandutta	Balgarh-III	5.07	No.FFE(F)5-1/95	27.11.1995
229	Jhandutta	Balgarh-IV	60.66	No.FFE(F)5-1/95	27.11.1995
230	Jhandutta	Balgarh-V	10.57	No.FFE(F)5-1/95	27.11.1995
231	Jhandutta	Balgarh-VI	8.19	No.FFE(F)5-1/95	27.11.1995
232	Jhandutta	Ghandir-I	10.86	No.FFE(F)5-1/95	27.11.1995
233	Jhandutta	Ghandir-II	31.41	No.FFE(F)5-1/95	27.11.1995
234	Jhandutta	Ghandir-III	17.78	No.FFE(F)5-1/95	27.11.1995
235	Jhandutta	Ghandir-IV	18.46	No.FFE(F)5-1/95	27.11.1995
236	Jhandutta	Ghandir-V	9.64	No.FFE(F)5-1/95	27.11.1995
237	Jhandutta	Ghandir-VI	7.46	No.FFE(F)5-1/95	27.11.1995
238	Ghumarwin	Nalahali	4.75	No.FFE(F)5-1/95	27.11.1995
239	Ghumarwin	Takrera-II	2.81	No.FFE(F)5-1/95	27.11.1995
240	Bharari	Karloti-I	8.14	No.FFE(F)5-1/95	27.11.1995
241	Bharari	Karloti-II	4.75	No.FFE(F)5-1/95	27.11.1995
242	Bharari	Chat-I	4.56	No.FFE(F)5-1/95	27.11.1995

243	Bharari	Chat-II	7.23	No.FFE(F)5-1/95	27.11.1995
244	Kalol	Saneera-I	7.19	No.FFE(F)5-1/95	27.11.1995
245	Kalol	Saneera-II	6.28	No.FFE(F)5-1/95	27.11.1995
246	Kalol	Pakhar	23.42	No. FFE-B(F)5-3/95	27.11.1995
247	Kalol	Silwin-I	16.28	No. FFE-B(F)5-3/95	27.11.1995
248	Kalol	Silwin-II	16.18	No. FFE-B(F)5-3/95	27.11.1995
249	Kalol	Dhanoula	32.42	No. FFE-B(F)5-3/95	27.11.1995
250	Kalol	Paploha	46.55	No. FFE-B(F)5-3/95	27.11.1995
251	Kalol	Dhani	53.20	No. FFE-B(F)5-3/95	27.11.1995
252	Kalol	Kakrer-I	153.31	No. FFE-B(F)5-3/95	27.11.1995
253	Kalol	Kakrer-II	11.79	No. FFE-B(F)5-3/95	27.11.1995
254	Kalol	Kakrer-III	18.03	No. FFE-B(F)5-3/95	27.11.1995
255	Kalol	Malhot-I	30.32	No. FFE-B(F)5-3/95	27.11.1995
256	Kalol	Malhot-II	11.07	No. FFE-B(F)5-3/95	27.11.1995
257	Kalol	Behal	49.08	No. FFE-B(F)5-3/95	27.11.1995
258	Kalol	Kot-I	30.06	No. FFE-B(F)5-3/95	27.11.1995
259	Kalol	Kot-II	30.68	No. FFE-B(F)5-3/95	27.11.1995
260	Kalol	Malhot-III	10.40	No. FFE-B(F)5-3/95	27.11.1995
261	Kalol	Kharly-I	66.40	No. FFE-B(F)5-3/95	27.11.1995
262	Kalol	Kharly-II	38.64	No. FFE-B(F)5-3/95	27.11.1995
263	Kalol	Kharly-III	47.97	No. FFE-B(F)5-3/95	27.11.1995
264	Kalol	Kharly-IV	19.08	No. FFE-B(F)5-3/95	27.11.1995
265	Kalol	Uljiar	34.61	No. FFE-B(F)5-3/95	27.11.1995
266	Kalol	Duhak-I	8.01	No. FFE-B(F)5-3/95	27.11.1995
267	Kalol	Duhak-II	5.82	No. FFE-B(F)5-3/95	27.11.1995
268	Kalol	Duhak-III	4.42	No. FFE-B(F)5-3/95	27.11.1995
269	Kalol	Duhak-IV	29.76	No. FFE-B(F)5-3/95	27.11.1995
270	Kalol	Duhak-V	17.61	No. FFE-B(F)5-3/95	27.11.1995
271	Jhandutta	Bhatoli-I	2.39	No. FFE-B(F)5-3/95	27.11.1995
272	Jhandutta	Tanyur	3.08	No. FFE-B(F)5-3/95	27.11.1995
273	Jhandutta	Jamly	7.57	No. FFE-B(F)5-3/95	27.11.1995

274	Jhandutta	Behna Jattan-I	1.80	No. FFE-B(F)5-3/95	27.11.1995
275	Jhandutta	Behna Jattan-II	1.91	No. FFE-B(F)5-3/95	27.11.1995
276	Jhandutta	Behna Jattan-III	1.60	No. FFE-B(F)5-3/95	27.11.1995
277	Jhandutta	Behna Jattan-IV	4.21	No. FFE-B(F)5-3/95	27.11.1995
278	Jhandutta	Behna Jattan-V	1.48	No. FFE-B(F)5-3/95	27.11.1995
279	Jhandutta	Samleta-I	6.17	No. FFE-B(F)5-3/95	27.11.1995
280	Jhandutta	Samleta-II	1.23	No. FFE-B(F)5-3/95	27.11.1995
281	Jhandutta	Kallar	1.54	No. FFE-B(F)5-3/95	27.11.1995
282	Jhandutta	Dhanter	5.28	No. FFE-B(F)5-3/95	27.11.1995
283	Jhandutta	Jhareri	13.92	No. FFE-B(F)5-3/95	27.11.1995
284	Jhandutta	Fatoh	2.10	No. FFE-B(F)5-3/95	27.11.1995
285	Jhandutta	Dharoti	2.66	No. FFE-B(F)5-3/95	27.11.1995
286	Jhandutta	Randoh-I	4.98	No. FFE-B(F)5-3/95	27.11.1995
287	Jhandutta	Randoh-II	1.98	No. FFE-B(F)5-3/95	27.11.1995
288	Jhandutta	Bhatoli-II	1.38	No. FFE-B(F)5-3/95	27.11.1995
289	Jhandutta	Kothi-I	1.21	No. FFE-B(F)5-3/95	27.11.1995
290	Jhandutta	Kothi-II	1.29	No. FFE-B(F)5-3/95	27.11.1995
291	Jhandutta	Dhararsani-I	2.13	No. FFE-B(F)5-3/95	27.11.1995
292	Jhandutta	Dhararsani-II	2.15	No. FFE-B(F)5-3/95	27.11.1995
293	Jhandutta	Nakhlera	1.84	No. FFE-B(F)5-3/95	27.11.1995
294	Jhandutta	Samletu	2.71	No. FFE-B(F)5-3/95	27.11.1995
295	Jhandutta	Kaharwin	1.52	No. FFE-B(F)5-3/95	27.11.1995
296	Jhandutta	Kulhan	2.77	No. FFE-B(F)5-3/95	27.11.1995
297	Jhandutta	Basanbari	2.00	No. FFE-B(F)5-3/95	27.11.1995
298	Jhandutta	Hirapur-II	2.27	No. FFE-B(F)5-3/95	27.11.1995
299	Bharari	Kent	6.29	No. FFE-B(F)5-3/95	27.11.1995
300	Sadar	Kolnu-I	4.35	No. FFE-B(F)5-3/95	27.11.1995
301	Sadar	Kolnu-II	5.20	No. FFE-B(F)5-3/95	27.11.1995
302	Sadar	Niharkhan Basla-I	3.13	No. FFE-B(F)5-3/95	27.11.1995
303	Sadar	Niharkhan	24.83	No. FFE-B(F)5-3/95	27.11.1995

		Basla-II			
304	Sadar	Niharkhan Basla-III	3.31	No. FFE-B(F)5-3/95	27.11.1995
305	Sadar	Niharkhan Basla-IV	2.05	No. FFE-B(F)5-3/95	27.11.1995
306	Sadar	Niharkhan Basla-V	2.11	No. FFE-B(F)5-3/95	27.11.1995
307	Sadar	Niharkhan Basla-VI	7.55	No. FFE-B(F)5-3/95	27.11.1995
308	Sadar	Niharkhan Basla-VII	2.73	No. FFE-B(F)5-3/95	27.11.1995
309	Sadar	Niharkhan Basla-VIII	3.45	No. FFE-B(F)5-3/95	27.11.1995
310	Sadar	Niharkhan Basla-IX	1.37	No. FFE-B(F)5-3/95	27.11.1995
311	Sadar	Chalela	3.56	No. FFE-B(F)5-3/95	27.11.1995
312	Sadar	Kothi-I	14.21	No. FFE-B(F)5-3/95	27.11.1995
313	Sadar	Kothi-II	18.41	No. FFE-B(F)5-3/95	27.11.1995
314	Sadar	Dunglu-I	4.21	No. FFE-B(F)5-3/95	27.11.1995
315	Sadar	Dunglu-II	2.37	No. FFE-B(F)5-3/95	27.11.1995
316	Sadar	Dunglu-III	1.60	No. FFE-B(F)5-3/95	27.11.1995
317	Sadar	Sai Naiodowan-I	7.40	No. FFE-B(F)5-3/95	27.11.1995
318	Sadar	Sai Naiodowan-II	8.14	No. FFE-B(F)5-3/95	27.11.1995
319	Sadar	Sihra-I	5.79	No. FFE-B(F)5-3/95	27.11.1995
320	Sadar	Sihra-II	7.39	No. FFE-B(F)5-3/95	27.11.1995
321	Sadar	Neri	7.34	No. FFE-B(F)5-3/95	27.11.1995
322	Sadar	Bahlị	3.71	No. FFE-B(F)5-3/95	27.11.1995
323	Sadar	Khalota	1.03	No. FFE-B(F)5-3/95	27.11.1995
324	Sadar	Chanjota-I	6.94	No. FFE-B(F)5-3/95	27.11.1995

325	Sadar	Chanjota-II	3.60	No. FFE-B(F)5-3/95	27.11.1995
326	Sadar	Painjal Khurd	13.16	No. FFE-B(F)5-3/95	27.11.1995
327	Sadar	Janer-I	9.95	No. FFE-B(F)5-3/95	27.11.1995
328	Sadar	Janer-II	2.85	No. FFE-B(F)5-3/95	27.11.1995
329	Sadar	Galod	14.11	No. FFE-B(F)5-3/95	27.11.1995
330	Sadar	Sakroa	3.74	No. FFE-B(F)5-3/95	27.11.1995
331	Sadar	Dhanser	1.58	No. FFE-B(F)5-3/95	27.11.1995
332	Sadar	Jamthal-I	43.06	No. FFE-B(F)5-3/95	27.11.1995
333	Sadar	Jamthal-II	23.63	No. FFE-B(F)5-3/95	27.11.1995
334	Sadar	Jamthal-III	5.78	No. FFE-B(F)5-3/95	27.11.1995
335	Ghumarwin	Kothi-I	3.68	No. Fts. (F)5-3/92 Part	16.10.1993
336	Ghumarwin	Kayari-I	1.91	No. Fts. (F)5-3/92 Part	16.10.1993
337	Ghumarwin	Kayari-II	1.56	No. Fts. (F)5-3/92 Part	16.10.1993
		Total:	**3622.61**		

(Office record DFO Bilaspur)

1.7 **Period of the Plan: -** This Working Plan is for a period of 15 years w.e.f. 1st April, 2012 i.e. w.e.f. 2012-13 to 2026-27. This period is considered sufficient to stock areas to be treated. Except for unforeseen circumstances there would not normally be a need for revision of the Working Plan during the period of the plan. The past Working Plan expires on 31.03.2009. Hence, the gone over period between 01.04.2009 to 31.03.2012 has been counted towards the period of current Working Plan. All kind of removals in gone over period will be counted towards period of current Working Plan.

Since, the period remained during the expiry of last plan will be considered as gone over as a part of expired working plan, hence all the removal etc. during this period has been included in the period of working plan, hence shall be counted for in the relevant control forms.

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CHAPTER – II

THE CHIL WORKING CIRCLE

2.1 General Constitution: - All the Chil areas of the Chil Working Circle of the expiring working plan except Tiun C6b Dukhli and Samoh C8a Bidwin where plantation of Khair and chil was undertaken in the past and not established so far have been included in this working circle; these two forests have now been allotted to plantation working circle. In addition, all the chil bearing undemarcated protected Forests numbering 112, most of which have not so far been brought under proper management have now been included in this Working Circle.

2.2 General Character of Vegetation: - The description of the crop has been given in detail in para 2.2 of Chapter_II, part_I under type 9C Sub-tropical pine forests. The crop in general consists of the following types-

i) Very open to open Chil crop of over 120 years of age with or without young forests containing such crop have been allotted to P.B.I

ii) Open to moderately dense middle aged crop of 70 to 100 year of age with advance growth of 15 to 40 years of age present in compact but otherwise scattered groups. The compartments containing such type of crop have been allotted to P.B-II and P.B III.

iii) Moderately dense to dense young crop of age ranging from 10 to 40 years either with scattered mature mother trees still standing over them or without mother trees as in the case of established plantations the compartments containing such type crop have been allotted to P.B.IV.

2.2.1 Normal distribution of age classes is absent in most of the forests. The overall position of distribution of Diameter classes in the chil forests of this Division as compared to those of normal forests as derived from yield table are as under:-

Diameter (cm)	d.b.h Class	Stems/hectare (%) As per yield table for normal forests.	Stems/hectare (%) In Chil Forests of Bilaspur Forest Division	Variation
10 - 20	V	47.32	42.47	(-)4.85
20 - 30	IV	21.61	62.02	(+)40.41
30 - 40	III	12.14	26.28	(+)14.14
40 - 50	II A	8.10	8.44	(+)0.34
50 – 60	II B	5.42	5.72	(+)0.30
60 & above	I A & over	5.41	1.99	(-)3.42

2.2.2 From the above table it is clear that trees of higher classes are deficient and those of middle classes are surplus which indicates the harvesting of trees of higher classes From the perusal of the grant of T.D as depicted in table 1.3 of part I of this plan it is revealed that maximum trees have been given of II A and upward classes. Thus for keeping the normalcy of the forests and adequate seed production a complete ban on felling of trees of IIA and IIB classes have to be imposed except for silvicultural markings.

2.2.3 The Chil forests situated on higher and cooler localities are of better quality i.e., II/III as in Jhanjiar block where as those on lower and hotter aspects are comparatively inferior i.e., III/IV as in Baseh block. The overall quality of the crop in the Division is III.

2.3 **Block and Compartments:** - Forest Blocks and compartments remain the same as in the expiring Working plan except Fatehpur C1. Swarghat which has been split into two sub-compartments. The details of changes made have been listed in para 1.4.1 of Chapter-I part-II vide Table 1.2. The newly constituted Demarcated Protected Forests have been included by allotting them the suitable numbers of compartments or sub compartments according to their locations. The Undemarcated protected Forests have been included either as such as mentioned in the revenue record or in the settled form by the Forest Settlement authorities for notifying them as Demarcated Protected Forests.

2.4 *Special Objects of Management*: - These would be

- To convert the present uneven aged open crop of Chil into a fully stocked even aged crop with normal distribution of age classes.
- To harvest the optimum yield of timber, pulpwood, firewood resin and other forest produce.
- To meet the demand of timber and other forest produce of the local people both right holders and non right holders according to the silvicultural availability.
- To speedily restock the areas deficient in regeneration either naturally or artificially.
- To fully protect the forests from fires by control burning and through other fire control measures.
- To tend the existing crop by under taking subsidiary silvicultural operations, thinning etc., for improving the health of the crop.

2.5 Area and Allotment: - The gross area of the working circle is 5647.81 ha out of which 3851.56 ha is of Reserved and Demarcated Protected Forests and 1796.25 ha of Undemarcated Protected Forests. The forests allotted to this working circle are given in appendix H. The Range wise details are as given in table 2.1 below:-

TABLE – 2.1

TABLE 2.1						
Name of Range	Classification of Forests	P.B. I	P.B. II	P.B. III	P.B. IV	Total
Bharari	R.F.s.	0.00	0.00	0.00	0.00	0.00
	D.P.F.s.	246.50	159.10	283.74	134.65	823.99
	U.P.F.s	19.24	0.00	34.99	0.00	54.23
	Total:	**265.74**	**159.10**	**318.73**	**134.65**	**878.22**
Ghumarwin	R.F.s.	0.00	0.00	0.00	0.00	0.00
	D.P.F.s.	124.80	62.40	159.65	166.42	513.27
	U.P.F.s	10.00	0.00	48.84	39.47	98.31
	Total:	**134.80**	**62.40**	**208.49**	**205.89**	**611.58**
Jhandutta	R.F.s.	0.00	0.00	0.00	0.00	0.00
	D.P.F.s.	484.92	458.26	303.18	400.67	1647.03
	U.P.F.s	4.20	0.00	0.00	48.26	52.46
	Total:	**489.12**	**458.26**	**303.18**	**448.93**	**1699.49**
Kalol	R.F.s.	0.00	0.00	0.00	0.00	0.00
	D.P.F.s.	14.80	155.44	58.53	8.80	237.57
	U.P.F.s	0.00	10.67	18.47	0.00	29.14
	Total:	**14.80**	**166.11**	**77.00**	**8.80**	**266.71**
Sadar	R.F.s.	0.00	0.00	0.00	30.80	30.80

	D.P.F.s.	3.56	0.00	41.94	61.80	107.30
	U.P.F.s	89.59	0.00	0.00	2.25	91.84
	Total:	**93.15**	**0.00**	**41.94**	**94.85**	**229.94**
Swarghat	R.F.s.	0.00	0.00	0.00	0.00	0.00
	D.P.F.s.	126.60	190.00	75.00	100.00	491.60
	U.P.F.s	312.89	365.43	428.32	363.63	1470.27
	Total:	**439.49**	**555.43**	**503.32**	**463.63**	**1961.87**
Grand Total:	R.F.s.	0.00	0.00	0.00	30.80	30.80
	D.P.F.s.	1001.18	1025.20	922.04	872.34	3820.76
	U.P.F.s	435.92	376.10	530.62	453.61	1796.25
	Total:	**1437.10**	**1401.30**	**1452.66**	**1356.75**	**5647.81**

2.6 **Analysis and the Evaluation of Crop**: Stock maps on 1:15000 scale based on revenue maps depicting types of vegetation, boundary, etc., have been prepared. Detailed descriptions have been placed in the compartment history files.

2.6.1 The crop composition, species wise is given ahead in table 2.3; the abstract of which is also given here as under:-

Species	Area (ha.)	Percentage
Pure Chil.	5189.14	92.25
Chil Plantation	35.65	00.63
Chil mixed with BL Species	268.91	04.78
Chil mixed with Khair	32.11	00.57
Culturable blanks	25.43	00.45
Unculturable blanks	46.93	00.84
Included Cultivation	27.12	00.48
	5625.29	100.00

2.6.2 **Quality:** - Based on the height of dominant trees of various compartments, the average quality for the whole Working Circle has been assessed as quality III according to norms laid down by FRI Dehra Dun.

2.6.3 **Density:** - The density of each compartment or sub compartment was determined on the basis of ocular estimates and is given in the respective compartment history files. Except a few forests of Jhanjiar, Gochar and Fatehpur blocks the forests are generally

poorly stocked. The average crop density generally varies from 0.2 to 0.6 and the average density of the Working Circle has been assessed as 0.4.

2.6.4 Enumeration: -The partial enumeration has been done in this working circle and in P.B-I & P.B- IV the enumeration has been done 63.46% of the total area. In case of P.B-II & P.B-III the enuration is 23.73% of the total area of these P.Bs. The P.B wise detail of Chil is summarized in the Table 2.2 below:-

TABLE 2.2

ABSTRACT OF ENUMERATION RESULT OF CHIL IN CHIL WORKING CIRCLE P.B . WISE

P.B	Total area in ha.	Area enumerated in ha.	% of area enumerated	NUMBER OF CHIL TREES										
				V	IV	III	IIA	IIB	IA	IB	IC	ID	TOTAL	Total volume m3
I	1437.10	885.70	61.70	89976	73806	29070	10724	6148	2940	1933	1101	694	216392	116895.24
II	1401.30	57.20	4.08	4037	2394	894	111	356	57	31	45	21	7946	3602.48
III	1452.66	620.15	42.69	17478	23099	9611	3255	1634	697	258	151	19	56202	30767.54
IV	1356.75	886.34	65.33	57540	78009	39001	13119	5998	2510	1006	514	236	197933	116056.92
Total	**5647.81**	**2450.39**	**43.45**	**169031**	**177308**	**78576**	**27209**	**14136**	**6204**	**3228**	**1811**	**970**	**478473**	**267322.18**
Estimated Total:				373503	351276	151332	47662	32323	11236	5632	4195	0	977159	
				29880.21	**108895.66**	**128632.20**	**75306.51**	**82422.96**	**42020.81**	**27935.96**	**20807.94**	**0.00**	**515902.3**	

2.7 Silvicultural System: - The Chil forests allotted to this working circle will be managed under the irregular shelter wood system which permits certain flexibilities like selection markings and retention of advance growth. The system has been described in details in Punjab leaflet No. 11, the main features of which are –

- Compact groups of well grown poles up to 30 cm d.b.h are retained as part of the future crop.
- Where steepness of ground inhibits; fellings and markings are done on selection principles.
- The resulting crop is thus likely to be a little irregular.

2.8 Rotation: - The rotation is fixed at 120 years as adopted in the Working Plan under revision. According to the FRI yield tables for III quality Chil, the mean annual increment culminates at 120 years. Also crops with an average Diameter of 51.3 cm are produced at this age. This figure is low because yield tables are based on C grade thinning. As the crops are more open, the average diameter at this age is likely to be higher probably nearer 60 cms. This size is also suitable for producing sawn timber of the required sizes in demand in the market.

2.9 Conversion Period: - The process of conversion of forests into uniform forests was started in 1953 with the implementation of Sh. Ishar Singh's Working Plan. But most of the regeneration areas of this plan continued to be in regeneration block in Sh.Gurmit Singh's Working Plan because those were not properly regenerated. Similarly the regeneration areas have not been properly regenerated during the period of the expired Working Plan due to biotic factors like severe fires, grazing etc. So the conversion period corresponding to the rotation of Chil would be 120 years .

2.10 Regeneration Period: - In Bilaspur Forest Division natural regeneration of Chil is not a problem. With effective closure and adequate fire protection it is possible to completely stock a felled area in about 25-30 years period. Crop of this age attains a height of about 8 meters and diameter of 50-60 cm d.b.h which is considered safe from fire damage. Accordingly, regeneration period of 30 years is adopted same as in the plan under revision.

2.10.1 Seeding fellings are not required in 789'98 ha area i'e' 56'07% of the total P.B. I area because the average number of chil trees of IIA and above classes standing over these areas come out to be 25 or less which are just sufficient to be kept as seed bearers and conservation point of view. The balance 619 ha area will be worked during the regeneration period of 30 years.

2.11 **Division into periods: -** Keeping in view the regeneration period the conversion period is, divided into 4 fixed periods of 30 years each. Correspondingly, there will be four periodic blocks.

2.12 **Allotment to Periodic Blocks: -** The allotment of forests to the different P. Bs has been given in appendix-H based on the following criterion:

P.B.I — P.B.I area of the expiring working Plan which were not worked or worked partially, badly fire burnt area, partially regenerated areas, young plantations which have not been fully established and the forests with overwhelming mature and over mature trees have been allotted to P.B.I.

P.B.II — Middle aged forests, approaching to maturity with a sprinkling of mature trees all over have been allotted to P B.II.

P.B.III — All forests which have not been allotted to P.B.I, P.B.II and P.B.IV have been allotted to P.B.III.

P.B.IV — The forests bearing established chil regeneration of reasonable density have been allotted to P B.IV.

2.13 **Treatment of P.B.I Areas: -** As mentioned in paragraphs 2.10.1 above; the forests allotted to P.B.I have been divided in two categories and treatment prescribed for each will be as under;-

i. **Where seeding fellings are not required: -** Out of the total area of 1408 ha under P.B.I no seeding fellings are required over an area of 789.98 ha. The forests in this category contain 25 or less chil trees of IIA and above classes per ha which are just sufficient to be kept as seed bearers and also for conservancy purposes. In these forests planting of chil will be done where the natural regeneration is in-adequate along with other cultural operations like bush cutting cleanings, etc. These forests shall be protected against fire meticulously.

ii. **Where seeding Felling is required: -** Forests containing more than 25 chil trees per ha of IIA and above classes have been kept in this category. The area of such forests

is 616.00 ha. The regeneration fellings over this area will be completed within the regeneration period i.e., 30 years w.e.f. 1994-95. The sequence of fellings in this category has been so arranged that areas having poor density will be gone over during the early years of the plan.

2.14 Treatment of P.B. II Areas: - No green fellings will be carried out in this P.B to safe guard the future yield. Removal of only dry and fallen trees will be allowed.

2.15 Treatment of P.B. III Areas: The stocking in this P.B. on the whole is below the normal and generally no thinning would be necessary. However, in some compartments which may require thinning, C grade thinning will be carried out along with improvement fellings. The average diameter in this P.B is 28.81 cm and according to thinning table, 432 trees are required per ha with a spacing of about 5 rneter against 172 trees actually standing.

2.16 Treatment of P.B. IV Areas: - Most of the forest allotted to this P.B require removal of over head cover. Cleanings, light thinning bush and climber cutting operations will be carried out.

2.17 Calculation of yield: - The prescribed yield will consist of volume of all trees felled throughout the working circle.

2.18 Yield from P.B-I:- The yield from P.B-I is work out as under:-

METHOD-I

The annual yield from P.B-I is calculated by the following formula:-

$$Y = \frac{C1V1+C2V2+C3V3}{P}$$

Where Y= Annual Yield.

P= Regeneration Period i.e 30 years.

C1= Proportion of Class-I trees available for felling during the period i.e 80% of total stock.

20% to be retined for conservance and seed production = 0.8.

C2= Proportion of Class-II trees available for felling during the period i.e 20% of total stock 80% to be retained for seed production and conservancy = 0.2.

C3= Proportion of Class-III, IV & V trees available for felling during the period i.e. 50% of total stock. 50% to be retained as advance growth and also for conservancy purpose = 0.5.

V1 = Volume of Class-I trees = 37505.70 m3

V2 = Volume of Class-II trees= 52900.10 m3

V3 = Volume of Class-III, IV & V trees = 78206.65 m3.

By substituting these values the annuial yield comes out to be as under:-

$$Y = \frac{(0.8 \times 37505.70) + (0.2 \times 52900.10) + (0.5 \times 78206.65)}{30}$$

= 2656.264 m3 or say 2500 m3

2.19 **The Prescribed Yield from P.B-I & its Control:-** The annual yield of 2500 m3 is prescribed from P.B-I and all Chil trees removed from P.B-I will count towards this yield. However to facilitate the working either whole compartment or part of it is felled in a year in such a manner that variation of 10% of prescribed annual yield should not exceed for a block of 5 year.

2.20 **Sequence of fellings:-** The sequence of felling from P.B-I area which have to be gone over under the seeding fellings is given in table 2.4 below. In formulating this sequence efforts has been made to properly balance the annual yield. The estimation of the yield likely to be obtained in seedings fellings has also been indicated for each compartment.

2.21 Current Annual Increment:

Annual volume increment has been adopted from Kunihar Working Plan:

Class	V	IV	III	IIA	IIB	IA	IB	IC	ID	TOTAL
Dia	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	
	Bilaspur Felling Series:									
No. of trees	373503	351276	151332	47662	32323	11236	5632	4195	0	977228
Vol. factor (m3)	0.08	0.310	0.85	1.58	2.55	3.74	4.96	4.96	4.96	
Vol. in m^3	**29880.21**	**108895.66**	**128632.20**	**75306.51**	**82422.96**	**42020.81**	**27935.96**	**20807.94**	**0.00**	515906.25
Increment in m^3	1706.16	3985.581	3421.617	1355.517	956.106	319.358	111.743	33.2927	0	11889.374

The increment work out of 1.85% .

TABLE – 2.4.

Felling Programme for PB.I areas of Chil Working Circle

(i)Where Seeding Fellings are not required

Name of Range	Name of Block	Name of Forests	Area in Ha.
Swarghat	Swarghat	C2 Swarghat	14.40
		C8 Banner	44.40
	Rattanpur	C2 Rattanpur	25.20
		DPF	
Bharari	Nihari	C9a Sahib Kund	**20.50**
Ghumarwin	Harlog	C5a. Palti	**40.40**
	Paniyala	C2. Tiun Khas	**54.00**
Jhandutta	Gochar	C2. Kolka	**46.80**
	Jhandutta	C6a. Jhaula	**7.50**
	Gochar	C2b. Kuthera	**50.00**
	Gochar	C4a. Kathiun	**34.00**

Kalol	Malhot	C1. Dhanoula	14.80
			352.00
		UPF	
Swarghat	Swarghat	UPF. Meoth-II	39.24
		UPF. Buhai	67.58
		UPF. Tikkar	47.00
		UPF. Kulah	10.48
	Rattanpur	UPF. Pallah	30.00
		UPF. Khui	14.00
		UPF. Sai Kanetan	76.93
		UPF. Sai Brahamna	17.66
Sadar	Brahampukhar	UPF. Luharda	55.75
		UPF. Chaleli	37.90
Chumarwin	Harlog	UPF. Bangleda - III	12.32
Jhandutta	Samoh	UPF. Jamothi	4.20
	Gochar	DPF. Balsinna - IV	3.17
	Samoh	DPF. Thuran - III	9.06
		DPF. Badol - II	5.67
		DPF. Salasi	7.02
			437.98
		GRAND TOTAL	789.98

Legal Felling Series:

(ii) Where seeding fellings are required (Legal felling series)

Year	Range	Block	Forest	Area In Hac	Estimated yield in seeding felling M3	Remarks
2012-13	Jhandutta	Gochhar	C2b Kallar	9.5	857.52	Removals will be restricted to 3500 m3 each
	Bharari	Nihari	C10 Nihari	23.2	1429.04	
2013-14	Bharari	Nihari	C8a Mundkhar	7.6	898.96	
2014-15	Jhandutta	Jhandutta	C1a Prahu	4.8	711.65	
2015-16	Jhandutta	Samoh	C3a Ghagas	34.08	2910.69	
2016-17	Bharari	Mohra	C15 Doon	24.8	2669.64	

2017-18						year with permissible deviations.
2018-19	Jhandutta	Gocher	C6a Gajrera	24	2944.46	
2019-20	Ghumarwin	Ghumarwin	C17 Sadiar	18	2867.64	
2020-21	Bharari	Nihari	C11 a Manglot	10	1211.53	
2021-22	Jhandutta	Gocher	C9 b Chaleli	15.6	2331.93	
2022-23	Jhandutta	Samoh	C9 jamothi	39.6	3987.94	
2023-24					683.63	
2024-25	Jhandutta	Gocher	C6aJhaula	7.5		
2025-26	Jhandutta	Goacher	C6 b Gujrera	23.2	5506.64	

Voluntary Felling Series: Nil.

2.21.1 Methods of Executing Fellings in P.B-I Areas:- The following principals based on the guidelines contained in Punjab Leaflet No.2 are laid down for the guidance of marking officer. There will be two kinds of fellings viz. Seeding and final. The markings of these fellings will be done by the Divisional Forest Officer himself or his gzetted Assistant in accordance with the following rules:-

i) Seeding Felling

a) About 20 healthy, vigoursly growing, clean and straight boled, with well developed crown Chil trees will be retained as seed bearers per hectare on cooler aspects. However the number of seed bearers will be increased upto 25 on warmer aspects. Trees with twisted fibre will be discarded.

b) The seed bearers will be uniformaly spaced over the areas as for as possible. Middle aged trees of 40Cm to 60 Cm class should be preferred over mature and over mature trees.

c) Compact group of vigorously growing regeneration upto 30 Cm d.b.h covering at least 0 .25 hac. area with 0.7 crown density shall be retained as advance growth. Scattered young poles and saplings which can merge into general canopy of the crop will not be removed.

d) Selection cum improvement markings will be carried out in a width of about 30 Mtrs on either side of a road or perenial Nallas.

ii) Final Fellings:

i. Final fellings will not be done unless the regeneration has attained a height of 4 straight meters and has been control burnt twice.

ii. During final fellings all seed bearers shall be removed until or unless their retention is necessary for the regeneration of unregenerated gaps exceeding 0.25 ha or as a safety measure over patches of unestablished regeneration.

iii. All trees will be lopped to minimise damage to regeneration.

Subsidiary Silvicultural Operations in P.B.I

Fellings Refuge: *- The Chil areas are generally situated close to the habitations* and as such after the seeding fellings, it is expected that the refuse will be collected and cleared by the villagers in most of the cases. In case the debris is not cleared by the villagers then it is to be collected in small heaps in open places away from the seed bearers and burnt. The technique of disposal of felting refuse is explained in details in Punjab Forest Leaflet No.6 and will be followed. All unfit and inferior trees if not removed by the purchaser will also be disposed off.

Planting: - ordinarily after seeding fellings natural regeneration is expected to colonise the area. For this purpose the felled area will be fenced and protected against grazing and fire. But, if the natural regeneration does not come up or is inadequate, in a period of two years after fellings the area will be taken up for planting operations during the 3rd year.

Weedings, Cleanings and Thinning: - Weedings are necessary for proper development and early establishment of seedlings. Generally, two weedings in the 1st year and one in the 2nd year will be necessary. *Cleanings should commence early at the age of* 10 years. The cut material shall either be burnt or disposed off. The plants shall be spaced about 3m x 3m when 2m in height. Light thinning shall be carried out when the young crop is about 8 meters high which correspond to an age o f 30 Years.

The position of regeneration areas shall be assessed every five years under regeneration survey. If the progress of regeneration is found not satisfactory, further fellings will be discontinued.

Calculation of yield from P.B. II:- As only dead, dry and fallen trees have been prescribed to be removed from P.B. II areas, hence no yield is fixed from this P.B. If for

any reasons, removals are necessitated yield from such removals however will be counted against the total yield prescribed for the whole working circle but in no case marking for the right holders will be carried out in this P.B.

2.25 Calculation of yield And Method of Executing Fellings From P.B. III:- The crop of this P.B. is generally open and requires no thinning. However, 'C' grade thinning is prescribed in congested crops from which very nominal yield will be available' If for any reason, any other removals are done in the form of salvage markings, the yield from all such removals along with will the thinning yield will count against the total yield prescribed for the whole working circle.

2.25.1 The technique laid down in Punjab Leaflet No.1 and IA will be followed. As the crop in this P.B will be of varying age and size, no attempt shall be made to obtain uniformity of the whole crop. The tendancy to remove large sizes trees under the excuse of their being harmful to younger regeneration should be curbed as this practice reduced the age of crop which then has to be retained for a longer period to develop in maturity.

2.25.2:- Out of total area of 5647.81 hac. allotted to this working circle thinning will be required to be carried out over an area as given in the table 2.5 below. The programme for thinning cum improvement fellings is therefore prescribed according to table 2.5.

Table-2.5

PROGRAMME OF THINNING CUM IMPROVEMENT IN P.B-II

Year	Range	Block	Compartment	Area in hac.	Remarks
2012-13	Swarghat	Fatehpur	C1a Swarghat	43.00	
		Rattanpur	UPF Jol	3.16	
		Fatepur	UPF Balu	5.12	
			Total:-	51.28	
2013-14	Ghumarwin	Jhanjiar	C16c Rahat	18.00	
		Malyawar	UPF Bangleda-II	6.70	
		-do-	UPF Berdi	19.06	
		-	Total:-	43.76	
2014-15	Bharari	Jhanjiar	C4c Maryani	54.80	
2015-16	Jhandutta	Ghaniri	C1. Seru Salasi	83.60	
2016-17	Swarghat	Fatehpur	C6a Dhar Kanshi	32.00	

		Rattapur	UF Baddu	24.00	
			Total:-	56.00	
2017-18	Bharari	Jhanjiar	C13a Badhaghat	28.40	
	Ghumarwin	-do-	C16b Rahat	20.00	
			Total:-	48.40	
2018-19	Jhandutta	Gochar	C4b Kathiun	35.60	
	-do-	Samoh	C3d Nihan	10.99	
			Total:-	46.59	
2019-20	Bharari	Jhanjiar	C 11b Padyalag	6.40	
		-do-	C14a Kallar	29.30	
		-do-	UPF. Jashwani	9.16	
		-do-	UPF Dhaloh	3.97	
			Total:-	48.83	
2020-21	Ghumarwin	Panyala	C4a Bhiau	90.80	
2021-22	Jhandutta	Gochar	C6c Gujrehra	6.44	
		-do-	C7 Dholikhala	36.40	
			Total:-	42.84	
2022-23	Sadar	Bahadarpur	UPF Bandoh	2.09	
		-do-	UPF Sumari-I	19.30	
		-do-	UPF Sumari-II	1.42	
		-do-	UPF Majher	19.13	
			Total:-	41.94	
2023-24	Bharari	Jhanjiar	C3d Dakhiut-I	2.20	
		-do-	C3e Dakhiut-II	1.42	
		-do-	C4b Maryani	17.60	
		-do-	C5f Dohru	2.34	
		-do-	C5b Chokhna	2.01	
		-do-	C6a Chhandoh	24.40	
			Total:-	49.97	
2024-25	Jhandutta	Gochar	UPF Balhseena-I	37.65	
		-do-	UPF Ghandir-IV	18.26	
			Total:-	55.91	

2.26 Calcuation of Yield From P.B-IV:- It has been estimated that only 20% of IIA trees are available for removal. The remaining will merge with the young crop. The proportion of IIB and above trees is estimated to be 80% available for removal. The annual yield in this P.B is thereof calculated accordingly.

$$Y = \frac{(C1V1+C2V2)}{12}$$

Where Y= Annual Yield.

C1 & C2 are constents representing the proportion of IIA and IIB and above trees available for felling. In this case there values are 0.2 and 0.8 respectively. V1 and V2 are the volumes of IIA abd IIB and above trees. P is the regeneration period i.e 30 years.

$$Y = \frac{(0.2x56371.93) + (0.8x28683.24)}{30}$$

= 1140 M3 or say 1000 M3.

2.27 Yield Prescribed from P.B-IV:- The annual yield of 1000 m3 is therefore prescribed to be removed from the forests allotted to P.B-IV. All Chil trees removed from P.B.-IV will count against this prescribed yield irrespective of their size. The deviation should not increase 10% for a block of 5 years.

2.28 Method of Executing Fellings in P.B-IV:-

i) All trees standing over established regeneration will be marked for removal.

ii) Where ever necessary cleanings and B grade thinning will be carried out in congested young crop.

iii) The trees which are likely to damage the young crop when felled should be lopped before fellings.

iv) All dead, dry and fallen trees will be marked for removal.

v) No marking of trees other Chil will be done until or unless these are interfering with the growth of young chil crop.

Felling Programme:- The sequence of fellings in P.B-IV areas is given in table 2.6

Felling Series:

Table 2.6

Sequence of Felling in P.B-IV Areas

Year	Range	Block	Compartment	Area in hac.	Estimated Yield.
2012-13 & 2013-14	Bharari	Jhanjiar	C5a Tiamloo	32.70	1380 m3
2014-15	Jhandutta	Rahan	C1 Prahoo	40.00	1340 m3
2015-16 2016-17	Ghumarwin	Samoh	C2 Dhingoo	30.00	1020 m3
2017-18 2018-19	Jhandutta	Gochar	C1c Kallar	50.40	1490 m3
2019-20	Bharari	Jhanjiar	C12 Sohani Devi	18.00	630 m3
2020-21	Jhandutta	Gochar	C8b Chaleli	26.00	720 m3
2021-22	Bharari	Jhanjiar	C4a Maryani	30.00	770 m3
2022-23	Jhandutta	Samoh	C6b Sidhphat	19.20	960 m3
2023-24 2024-25	Bharari	Jhanjiar	C3b Chokhna	35.60	1180 m3
2025-26	Jhandutta	Samoh	C4a Suharphat	24.50	1040 m3
2026-27	Ghumarwin	Tiun	C6a Maaswar	42.80	1280 m3

The removals will be restricted to the prescribed yield i.e 1000 m3 each year with permission deviations.

Voluntary Felling Series: Nil.

2.30 Prescribed Yield: - The total annual yield prescribed for this Working Circle is 3500 m^3 as explained in Para 2.17.1 and 2.17.2

P.B	Annual prescribed Yield (m^3)
P.B. I	2500
P.B. II	–
P.B.III	–
P.B. IV	1000
TOTAL	3500

The annual variation in the prescribed yield is allowed up to 15 % but it should never exceed 10 % for a block of five years.

Whatever, yield has been prescribed in the Working Plan, this yield is subject to the final outcome of the Writ Petition (Civil) No. 202 of 1995 titled as T.N. Godavarman Thirumulkpal versus Union of India and others which is pending in the Hon'ble Apex Court.

2.31 Other Regulations:

2.31.1 Closures: - Out of all the forests included in P.B.I of this Working Circle, the forests where no seeding fellings are required will need closure forth with. Other areas will come under closure as and when they become due for seeding fellings as per programme suggested vide table 2.4. The total area of P.B.I being only 1/4th of the total area of the circle, the closure in P.B.I will therefore not adversely affect the interest of the right holders. Since there is heavy incidence of grazing in Bilaspur Forest Division, the closure period is kept as 10 years.

2.31.2 Grazing And Grass Gutting: - Grazing in the regenerated area is not to be allowed till the plants grow to a size safe enough against trampling damage. Practice of careless grass cutting from the closed area proves inimical to the seedlings especially in the first few years of their life as these are also cut recklessly and sometimes intentionally

along with grass. Grass cutting should therefore, be allowed in regeneration areas under close spot supervision of local Forest Guard for such period till the seedlings are tall enough to be safe against such damage.

2.31.3 Fire Protection: - The Chil forests of this tract are highly susceptible to fire which upsets not only the normal growth conditions but also impedes the implementation of the prescriptions and also the achievement of results aimed at. Therefore, the fire protection is of utmost importance and needs very special attention to achieve the objectives of the Plan. Keeping this in view a separate chapter on this subject has been added in this Working Plan.

2.31.4 Resin Tapping: - No resin tapping of the mother seed bearer trees left in P.B.I after seeding fellings and in areas requiring seeding fellings will be done.

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CHAPTER – III

THE PROTECTION WORKING CIRCLE

3.1 GENERAL CONSTITUTION This working circle includes all the forests which are located on steep to precipitous slopes, on broken terrain comprising of Chil, Shisham, Khair, Eucalyptus and open crop of broad leaved species mixed with a low proportion of commercially valuable trees like Khair, Shisham, Semal, Mango, Teminalia etc. The under growth varies from dense to open and consists mainly of *Carissa opaca, Dodonaea viscosa* and *Lantana camara*. Patches of Bamboos culms are also found in some forests allotted to this working circle particularly in Baseh, Bachhretu and Ghaniri blocks. Eucalyptus plantation areas where eucalyptus is to be replaced with other valuable species have also been included in this working circle. The condition of vegetation on the whole is rather poor because of heavy grazing and excessive harvesting in the past. Increase in the occurrence of xerophytic species is an indicator of retrogression that has been set in these forests. In some areas Khair plantations have been raised successfully in the past few years. Shisham has come up naturally in numerous suitable localities. which was subjected to indiscriminate hacking in the past and requires rest for recuperation. These forests are mainly situated on difficult, precipitous and erodible terrains.

3.2 GENERAL PRESCRIPTIONS

1. These forests are to be strictly protected.
2. Fire vulnerability of each forest to be assessed and preventive measures against fires planned and put in the APO
3. Soil and moisture conservation, treatment of landslips, gully formation and so forth, through extensive use of bio-engineering and contour trenching where feasible (on gentle slopes) to be planned. Areas indicated as available for planting in the forests allotted to this WC should actually be treated with staggered contour trenching and left to regenerate naturally.
4. Regular assessment of spread of invasive alien species in this WC to be monitored atleast once in two years and priority given to their removal in APOs

5. Some assessment of the presence / absence/ abundance levels of key wildlife species to be got done in forests of this WC and then periodic monitoring done and properly documented
6. Budget for these works to be tapped from MNREGS, NPV and regular Soil & Moisture Conservation (Plan/Non-Plan) Schemes
7. Extra care and caution to be exercised when dealing with FCA cases in forest allotted to this WC
8. The salvage removal of Protection Working Circle will be counted towards the main yield. Petty felling to be approved by the competent authority and the removal will be counted towards the main yield.

3.3 GENERAL CHARACTER OF THE VEGETATION The forests allotted to this Working Circle have their scattered distribution throughout the tract, hence they represent almost all the forest types starting from scrub in lower elevations and extending upto higher elevations. The forests are essentially to be protected and the management is purely based on criteria like soil and water conservation, biodiversity, carbon fixation etc.

3.4 SPECIAL OBJECTS OF MANAGEMENT

The special objects of management are as under:-

i) To protect the hill sides from further denudation and erosion by preserving and enhancing the forest cover and by undertaking soil conservation works in a planned manner, where ever necessary.

ii) To conserve moisture and streamline the flow of water in streams and *nalas* by protecting and enhancing vegetation cover in the watershed.

iii) To improve the growing stock in quality as well as in quantity by sowing and planting of suitable species.

iv) To protect the ban oak and other valuable broad leaved forests from indiscriminate exploitation and to preserve these as representative eco-systemS of the region.

v) To provide a suitable habitat for wild life and to protect non timber forest produce naturally growing in high altitudes.

vi) Consistent with the principles of soil conservation, to provide for grazing of sheep goats and buffaloes of local and migratory graziers who come to these areas and also to meet the genuine demands of right holders for timber and other forest products.

3.5 Blocks And compartments: - The details of compartments and blocks of this working circle have been given in appendix H. The nomenclature of the compartments has not been changed and kept the same as in the plan under revision.

3.6 Area and Allotment: - The gross area of this Working Circle is 4009.62 ha. Statement showing the area under different types of vegetation in different Ranges is given in table 3.1

TABLE 3.1

AREAS UNDER DIFFERENT TYPE OF VEGETATION OF PROTECTION WORKING CIRCLE (Ha.)

Range	Block		Name of Area	Area	Chil	Chil Plantation	Chil & MBL	Khair	Khair Plantation	Khair & MBL	Bamboo	Bamboo & MBL	MBL	Cultural blank	Un-culturable blank	Inclusion
Sadar	Brahampukhar		Bahadurpur	30.80	10.16								20.64			
Bharari	Bharari	D.P.F.	Thandora	3.92	0.98			0.98					1.96			
	Total:			3.92												
Kalol	Bachhretu	D.P.F.	C2 Ghatara	80.40												
Kalol	Bachhretu	D.P.F.	C4 Gharwasra	17.20												
Kalol	Bachhretu	D.P.F.	C7 Plungli	55.00												
Kalol	Bachhretu	D.P.F.	C9 Chaunta	53.04												
Kalol	Bachhretu	D.P.F.	C28 Sunihra	54.40												
Kalol	Bachhretu	D.P.F.	C29 Kothi Godam	52.80												
Kalol	Bachhretu	D.P.F.	Kuljisr	34.61												
Kalol	Bachhretu	D.P.F.	Duhak -I	8.10												
Kalol	Bachhretu	D.P.F.	Duhak -II	5.82												
Kalol	Bachhretu	D.P.F.	Duhak -III	4.42												
Kalol	Bachhretu	D.P.F.	Duhak -IV	29.76												
Kalol	Bachhretu	D.P.F.	Duhak -V	17.61												
	Total:			413.16												
Sadar	Brahampukhar	D.P.F.	C 4 Kasal	39.20												
	Total:			39.20												
Ghumarwin	Ghumarwin	D.P.F.	Mohin -I	4.12												
Ghumarwin	Ghumarwin	D.P.F.	Rachhera-II	1.60												
Ghumarwin	Ghumarwin	D.P.F.	Panol-III	12.63												
Ghumarwin	Ghumarwin	D.P.F.	Rohin-III	2.72												
				21.07												

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ıpartments

909.62 ha.
Ranges is

Cultural blank | Un-culturable blank

[illegible]	Gochar	D.P.F.	C11 Gochar	17.56												
[illegible]	Gochar	D.P.F.	Changar Talai	30.03	1.76			16.23					12.04			
[illegible]	Gochar	D.P.F.	Ghandir-I	10.86												
[illegible]	Gochar	D.P.F.	Ghandir-II	31.41												
	Total			89.86												
[illegible]	Harog	D.P.F.	C 9 Tihra	112.18												
[illegible]	Harog	D.P.F.	Rohin-VII	3.91												
	Total			116.09												
[illegible]	Jhandutta	D.P.F.	C3a Bah Jol	20.80	7.17			11.57					2.06			
[illegible]	Jhandutta	D.P.F.	Fatoh	2.10												
	Total			22.90												
[illegible]	Kalol	D.P.F.	C31 Joher Dhiani	165.20												
[illegible]	Kalol	D.P.F.	C33 Johar Khas	78.00												
[illegible]	Kalol	D.P.F.	C34 Sarak ka Johar	80.80												
[illegible]	Kalol	D.P.F.	C35 Tangawala	85.70												
[illegible]	Kalol	D.P.F.	C36 Chaknar Godam	62.00												
[illegible]	Kalol	D.P.F.	C37 Malroun	45.09												
[illegible]	Kalol	D.P.F.	C38 Chaknar	32.80												
[illegible]	Kalol	D.P.F.	C39 Kojar Sara Pani	112.63												
[illegible]	Kalol	D.P.F.	C40 Johar Sundary	133.65												
[illegible]	Kalol	D.P.F.	C 41 Bohar	39.20												
[illegible]	Kalol	D.P.F.	C42 Paploha	87.80												
[illegible]	Kalol	D.P.F.	C43 Gadyana	74.80												
	Total			997.67												
[illegible]	Malhot	D.P.F.	C44 Harawall	110.80												
[illegible]	Malhot	D.P.F.	C45 Dhani	75.60	0			1					74.6			
[illegible]	Malhot	D.P.F.	C46 Behal Godam	39.60												
[illegible]	Malhot	D.P.F.	Chalava	8.00												
[illegible]	Malhot	D.P.F.	Pakhar	23.42												
[illegible]	Malhot	D.P.F.	Kakrer-I	153.31												
[illegible]	Malhot	D.P.F.	Kakrer-II	17.79												
[illegible]	Malhot	D.P.F.	Kakrer-III	18.03												
[illegible]	Malhot	D.P.F.	Malhot-I	30.32												
[illegible]	Malhot	D.P.F.	Malhot -II	11.07												
[illegible]	Malhot	D.P.F.	Behal	49.08												
[illegible]	Malhot	D.P.F.	Malhot-III	10.40												
	Total			547.42												
[illegible]	Thanyala	D.P.F.	C5g Kothi	3.67												
[illegible]	Thanyala	D.P.F.	Row-I	11.77												

Ghumarwin	Paniyala	D.P.F.	Row-II	2.44
	Total:			17.88
Sadar	Sadar	D.P.F.	Sandoli-II	2.78
Sadar	Sadar	D.P.F.	Belna Brahmna	9.32
Sadar	Sadar	D.P.F.	Thoru III	1.70
	Total:			13.80
Jhandutta	Samoh	D.P.F.	C11b Baroa-II	2.65
Jhandutta	Samoh	D.P.F.	C13a Ser-I	2.36
Jhandutta	Samoh	D.P.F.	Tanyur	3.08
Jhandutta	Samoh	D.P.F.	Jamly	7.57
Jhandutta	Samoh	D.P.F.	Behna Jattan-I	1.80
Jhandutta	Samoh	D.P.F.	Behna Jattan-II	1.91
Jhandutta	Samoh	D.P.F.	Behna Jattan-III	1.60
Jhandutta	Samoh	D.P.F.	Behna Jattan-IV	4.21
Jhandutta	Samoh	D.P.F.	Behna Jattan-V	1.48
Jhandutta	Samoh	D.P.F.	Samleta-I	6.17
Jhandutta	Samoh	D.P.F.	Samleta-II	1.23
Jhandutta	Samoh	D.P.F.	Kothi-I	1.21
Jhandutta	Samoh	D.P.F.	Kothi-II	1.29
Jhandutta	Samoh	D.P.F.	Nakhlera	1.84
Jhandutta	Samoh	D.P.F.	Kaharwin	1.52
Jhandutta	Samoh	D.P.F.	Kulhan	2.77
Jhandutta	Samoh	D.P.F.	Basandbari	2.00
	Total:			44.69
	Grand Total:			**2327.66**
PROTECTION W.C. LIST OF UPF BLOCK - WISE				
Bharari	Mohra	U.P.F.	UPF Bhadrog	2.08
	Total:			**2.08**
Kalol	Bachhretu	U.P.F.	UPF Duhak	69.29
Kalol	Bachhretu	U.P.F.	UPF Gharwasra	8.41
Kalol	Bachhretu	U.P.F.	UPF Kosrian	30.57
Kalol	Bachhretu	U.P.F.	UPF Kothi	44.07
Kalol	Bachhretu	U.P.F.	UPF Piungli	29.25
Kalol	Bachhretu	U.P.F.	UPF Ganglch	220.70
Kalol	Bachhretu	U.P.F.	UPF Chaunta	31.19
Kalol	Bachhretu	U.P.F.	UPF Kuljar-I	10.27

	Sachhretu	U.P.F.	UPF Gharan	45.10					9.40				35.70						
	Total:			**488.85**															
	Sasoli	U.P.F.	UPF Dharot	86.00															
	Sasoli	U.P.F.	Nand Behla	71.00															
	Sasoli	U.P.F.	Bassa	101.00															
	Sasoli	U.P.F.	Kheri	14.00															
	Sasoli	U.P.F.	Guru Ka Lahor	35.73															
	Sasoli	U.P.F.	Bassi	101.00															
	Total:			**408.73**															
	Bhaina	U.P.F.	Gol Thai	212.00															
	Bhaina	U.P.F.	Lehri	164.20															
	Bhaina	U.P.F.	Dalhet	216.00															
	Total:			**592.20**															
	Ghumarwin	U.P.F.	UPF Ghumarwin	2.98															
	Total:			**2.98**															
	Sichar	U.P.F.	UPF Gandhir-II	0.67															
	Total:			**0.67**															
	Harlog	U.P.F.	UPF Dharat	7.48															
	Harlog	U.P.F.	UPF Harlog	6.45															
	Total:			**13.93**															
	Nahi	U.P.F.	UPF Buhar	28.78															
	Total:			**28.78**															
	Malhot	U.P.F.	UPF Chalawa	3.46															
	Malhot	U.P.F.	UPF Fufy Chalwana	11.23															
	Malhot	U.P.F.	UPF Kakrer III	16.82															
	Malhot	U.P.F.	UPF Malhot	10.21															
	Malhot	U.P.F.	UPF Pakhar	7.82															
	Total:			**49.54**															
	Nangam	U.P.F.	UPF Rani Kotla-I	9.82															
	Nangam	U.P.F.	UPF Kothi	22.89	0			17.1					5.79						
	Total:			**32.71**															
	Panjala	U.P.F.	UPF Bhadroun	29.50															
	Total:			**29.50**															
	Sadar	U.P.F.	UPF Bharathu-II	3.01															
	Sadar	U.P.F.	UPF Bharathu-III	2.43															
	Sadar	U.P.F.	UPF Bharathu-IV	3.18															

	Total:			8.62												
Swargh at	Swarghat	U.P.F.	UPF Jabbal	23.37	0			1.5					21.87			
	Total:			23.37												

3.7 Analysis And Evaluation of the Crop:-

3.7.1:- Stock Maps:- Stock maps have been prepared on 1:15000 Scale and placed in the concerned compartment history files. The percentage composition of the crop mix is given in table 3.1

3.7.2 Enumerations:- Enumerations of the important species like Khair, Shisham, Semal, Siris, Mango, Jamun, Tun, Harar, Behra, amla, Chil, Chhal, Kachnar, Willow, tun etc. have been carried out in the standard 10 cm diameter classes. The results of these enumerations and the assessment of growing stock thereof is given in detail in the appendix (iii) and abstract is given in table 3.2 below:-

TABLE 3.2

ABSTRACT OF ENUMERATION OF ECONOMICALLY VALUABLE SPECIES OF PROTECTION WORKING CIRCLE (VOLUME IN M3)

	Chil		Khair		Shisham		Total	
Range	No.	Volume	No.	Volume	No.	Volume	No.	Volume
Jhandutta	4688	5280.73	6707	616.702	52	6.464	11447	5903.896
Bharari	641	97.68	178	9.038	37	33.04	856	139.758
Sadar	7224	2447.32	687	34.457	1	0.064	7912	2481.841
Ghumarwin	4	3.02	695	39.577	37	2.368	736	44.965
Kalol	0	0	2586	250.637	782	84.508	3368	335.145
Swarghat	0	0	427	59.53	365	56.325	792	115.855
Total:	**12557**	**7828.75**	**11280**	**1009.941**	**1274**	**182.769**	**25111**	**9021.46**

3.7.3 METHOD OF TREATMENT The prescriptions in this chapter have been subdivided into following parts

i) Fire Management

ii) Invasive Alien Species Management

iii) Soil Moisture Conservation

iv) Encroachments

1. CLEARING OF ROADS Accidental fires in Chil forests are caused by lit cigarettes negligently thrown by passersby. As all Chil forests have sufficient fallen needles during summers (April –June), it easily catches fire and results in forest fires most of which are restricted to ground. To address this, both sides of roads upto 10m will be cleared off the pine needles twice a fortnight. The needles thus collected will be either control burnt in presence of forest official (FG/FW) or will be made use of in making check dams/vermicompost/briquettes.

2. NEEDLE COLLECTION Another important and probably the most common reason for fires in Chil forests are the intentional fires lit by locals to get fresh flush of grass from the forests. To combat such fires following strategies may be adopted singly or in combination:

a) **PARTICIPATION OF LOCAL PEOPLE** Since all such fires are caused by local people especially those having cattle, thus involving these stakeholders in fire management may help. Awareness programmes combined with monetary incentives could be tried here. Fire management committees may be constituted at Panchayat level or existing /new JFMCs may be involved. The incentive for protecting 100 ha forest may be fixed as follows:

i) No fire: Rs 10,000

ii) 1 fire: Rs 5000

iii) 2 fires: Rs 2000

iv)More than 2 fires: No incentive

The area chosen for such schemes will thus save on deployment of fire watchers and the amount so saved will be used towards paying the incentive.

b) **DEPLOYMENT OF FIRE WATCHERS** In areas where cooperation from local people is not forthcoming or habitations too far from the forest to keep a vigil against fire,

fire watchers may be deployed who will patrol the forests and alert the **Rapid Response Team** specially constituted at Range level during fire seasons.

c) USE OF PINE NEEDLES Another way of addressing the issue of fire is to make use of the pine needles. It could be in any form like handicrafts, fire briquettes, check dams etc.

Presently in H.P. handicrafts of Chil needles are being made by Kangra Mahila Sabha, Dharamsala and they have imparted such training to SHGs formed by MHWDP in Salooni, Chamba. After making a study of the economics of the enterprise, the same may be adopted in Bilaspur. However, as the exercise would involve identification of marketing channel etc, it is better to get it done through an NGO or any local Community based organization that are already into marketing of handicrafts.

Pine briquetting has also been tried in several places. This activity will not only save the forest but also help to improve seasonal livelihood of rural people. State Council for Science Technology & Environment has tried this enterprise in certain Panchayats. After making a study of the economics of the enterprise, the same may be adopted in Bilaspur.

Similarly pine needle check dams, *Pirule* have been made in Uttarakhand Forest Department and have also been tried in Kalatop Khajjiar Wildlfe Sanctuary. The collection of needles may be executed through JFMCs .This will result in dual advantage to JFMCs from Chil forests and will help in creating stake in Chil forests which otherwise generally being a monocrop of timber species (which means no immediate use/ access to resource) are neglected by people.

In forest compartments that are under active resin tapping, HPFDC resin workers or resin agents should get such compartments cleared of fallen pine needles atlewast twice in the fire season. This condition should be built into the agreement with the Corporation at the time of handing over the forest to them. Failure to comply should attract a penal price to the Corporation

3.7.4 INVASIVE ALIEN SPECIES: STRATEGY FOR CONTROL AND REHABILITATION OF AFFECTED AREAS

INTRODUCTION: Biological invasions – one of the anthropogenically mediated ecological perturbations – are threatening native biodiversity, preventing natural ecological succession and changing the community structure and composition, besides impacting ecosystem services. *Lantana camara* is perhaps one of the most important

invasive alien plant species (exotic weed) in forest ecosystems of India as also in Bilaspur Division. Other alien invasive plant species with significant impact on the forests of Bilaspur Division include *Parthenium hysterophorus*, *Eupatorium* (=*Chromolaena*) *adenophorum*, and *Ageratum conyzoides*. Whereas the incidence of *Parthenium* popularly known as *'Congress Grass'* is largely restricted to degraded and newly opened drier sites along roads and forest fringes, the other three invasive alien species tend to occupy all possible vacant places even under tree canopy. Even as *Eupatorium* and *Ageratum* show a clear preference for moister locales and show gregarious occurrence, at many places these share the niche and grow in an intimate mix with *Lantana*.

A reconnaissance was made during January 2011 to map the distribution of exotic weeds in various compartments in this Division. Whereas, it was possible to record the incidence of *Lantana* fairly accurately, the area infested with the other 3 main invasive alien species could not be recorded comprehensively due to these species being still in dormant condition.

Distribution if Invasive Alien Species in Bilaspur

Bilaspur Forest Division, Bilaspur

Format for anyalysis of data regarding Forest Invasive Species.

Chil Working Circle

Weed Infestation extent

No. of compartments

	<=25%		<=50%		<=75%		<=100%		Co- relation with fire incidents in las five years		
									Compartments that are sold as grass godowns/ bhabar grass.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha)
	23	568.21	27	938.65	16	419.44	1	41.31	6	6	28.80
	1	30.88	2	99.23	0	0	0	0	6	3	70.0
	9	194.76	29	756.22	27	537.87	8	260.85	11	10	186.60
	9	252.58	11	203.52	5	128.45	2	32.40	2	2	35.00
	4	41.60	6	57.27	8	143.44	2	24.40	1	1	20.0
	22	268.12	17	388.70	22	313.25	0	0	14	24	149.00
	68	1356.13	92	2443.59	78	1542.45	13	358.96	40	46	489.40

Plantation Working Circle

Weed infestation extent

No. of Comprtments

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire icidents in last five years		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha)
Swarghat	9	502.66	9	1138.5	17	2104.14	10	2223.10	6	6	105.0
Sadar	3	103.60	4	173.06	4	334.38	0	0	7	1	36.0
Jhanduta	0	0	0	0	7	93.72	2	10.80	0	0	0
Ghumarwin	0	0	3	14.09	1	15.60	0	0	0	0	0
Kalol	3	14.0	5	268.20	4	259.33	1	45.66	2	2	41.0
Bharari	0	0	0	0	2	104.48	0	0	0	0	0
Total	15	620.26	21	1593.9	35	2911.65	13	2279.56	15	9	182.0

Plantation WC

Weed Infestation extent

No. of compartments.

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire icidents in last five years co-relation with grass production		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha)
Swarghat	10	352.19	4	279.84	8	391.17	1	25.10	0	0	0
Sadar	15	335.88	73	1543.0	61	1784.0	2	126.46	43	33	426.0
Jhanduta	5	28.51	13	222.75	32	328.07	21	338.36	5	5	23.50
Ghumarwin	21	200.01	37	781.61	22	640.47	9	374.48	0	0	0
Kalol	6	75.36	20	571.87	16	508.45	16	321.69	4	4	23.0
Bharari	9	26.04	3	14.22	10	97.36	0	0	1	5	0
Total	66	1018	150	3413.29	149	3749.52	49	1186.09	53	47	472.5

Bamboo WC

Weed Infestation extent

No. of compartments.

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire incidences in last five years.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha
Sanghat	1	25.60	3	272.31	1	49.13	0	0	0	0	0
Sarai	0	0	1	39.2	0	0	0	0	2	1	20.0
Nanduta	0	0	0	0	0	0	0	0	0	0	0
Kumarwin	0	0	0	0	0	0	0	0	0	0	0
Sair	0	0	0	0	1	53.04	0	0	0	0	0
Kasrari	0	0	0	0	1	118	0	0	1	1	5.0
Total	1	25.60	4	311.51	3	220.17	0	0	3	2	25

Protection Working Circle

Weed Infestation extent

No. of compartments.

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire incidences in last five years.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha
Sanghat	0	0	0	0	1	23.37	0	0	0	0	0
Sarai	0	0	3	61.95	4	75.80	0	0	1	1	10.0
Nanduta	0	0	0	0	0	0	0	0	0	0	0
Kumarwin	0	0	0	0	0	0	0	0	0	0	0
Sair	5	244.23	5	193.53	14	805.7	12	1026.77	3	3	27.0
Kasrari	0	0	0	0	0	0	0	0	0	0	0
Total	5	244.23	8	255.48	19	904.87	12	1026.77	4	4	37

Any othr territorial W/C (other than overlapping WC)

Weed Infestation extent

No. of Compartmetn

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire incidences in last five years.		
	No.	Area	No.	Area	No.	Area	No.	Area			

									No. of fire incide nces	No. of compart ments affected	Area burnt (Ha
Swarghat	0	0	0	0	0	0	0	0	0	0	0
Sadar	0	0	0	0	0	0	0	0	0	0	0
Jhanduta	0	0	1	17.56	9	126.11	2	10.8	0	0	0
Ghumarwin	2	11.76	3	120.31	3	7.99	0	0	0	0	0
Kalol	0	0	0	0	0	0	0	0	0	0	0
Bharari	0	0	0	0	0	0	0	0	0	0	0
Total	**2**	**11.76**	**4**	**137.87**	**12**	**134.1**	**2**	**10.8**	**0**	**0**	**0**

Strategy for rehabilitation of forests infested with these four most noxious exotic weeds is dealt in detail as under:

CORE PRINCIPLES OF THE STRATEGY

- **CONTAIN FURTHER SPREAD** : *A close watch over the spread of exotic weeds will be kept through biennial monitoring mechanism and necessary corrections in the program will be made to remove the recent infestations on priority basis.*
- **COMPLETE REHABILITATION OF INFESTED AREAS:***It will involve shift from 'one time removal of weeds' to 'complete rehabilitation' of the treated areas by competing/ shading out exotic weeds. All noxious exotic weeds on any given area will be tackled simultaneously.*
- **RELIANCE ON ONLY MECHANICAL/MANUAL METHODS:** *In view of their environmental/ ecological concerns, the rehabilitation measures will NOT employ any Chemicals/ Biological methods of exotic weed control.*
- **NATURAL RESILIENCE OF NATIVE FLORA TO BE THE BASIS OF REHABILITATION ACTION:** *The natural regeneration of indigenous plant species on treated sites will be encouraged and facilitated to establish towards better environmental and ecological services, including fodder, fuel, water recharge, etc.*
- **NO EXOTIC SPECIES TO BE USED TO REHABILITATE TREATED SITES** *No potentially invasive exotic species – (viz. Leucaena leucocephala, Prosopis juliflora, Jatropha curcus, Tecoma stans, Tectona grandis, etc.) - will be used for plantation in the areas under rehabilitation, because of their deleterious effect on the native flora.*
- **REHABILITATION TO START FROM LOW INTENSITY INFESTATION AREAS AND TO PROGRESS TOWARDS AREAS WITH HEAVY INFESTATION:***Rehabilitation activities will start from the fringes of infestation zone with lower intensity infestation and will*

progress towards the heavily infestation areas. This approach will (i) allow tackling larger areas with the given financial resources and result in creating quick visible impact, and (ii) help in containing further spread of exotic weeds.

- **SELECTIVE PRIORITY REHABILITATION OF HEAVILY INFESTED CRITICAL HABITATS:** *Rehabilitation of heavily infested areas as starting point will be taken up only in limited number of carefully selected* ***critical habitats*** *like grazing grounds near habitations. Such sites will then act as nucleus from where rehabilitation activity will radiate to adjoining areas of high infestation.*

With the above mentioned core principles of the strategy, the approach/ plan to implement the strategy will be as under:

(a) **MANAGEMENT OF *LANTANA*** With the major focus of the management strategy on 'containing further spread', a two pronged approach, as described below, will be followed in tackling *Lantana* menace on forest lands. Table 4.2 gives spread of Lantana and the intensity of infestation.

APPROACH-I (FOR AREAS WITH LOW INFESTATION INTENSITY) More than 60% of the forest areas recorded to be under *Lantana* have been infested with this exotic weed within the past 10 years and have less than 25% intensity of infestation. Under this approach, these areas will be tackled on priority basis for the reasons that (i) with the given financial resources, it would be possible to rehabilitate larger areas for creating significant impact, and (ii) further spread of this exotic weed would be contained.

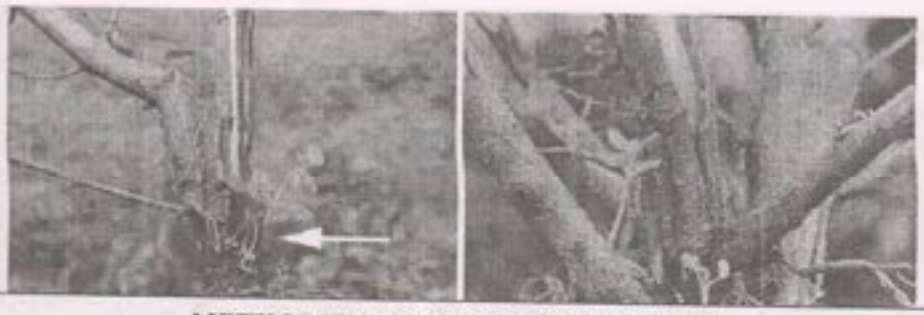
The rehabilitation activities will be started from the fringes of infestation zone with low intensity infestation and will progress towards the high infestation areas. Major activities under this approach will be manual cutting of *Lantana* bushes and encouraging establishment of local species, including grasses or augmenting populations of native species through plantation.

- **APPROACH-II (FOR AREAS WITH HEAVY INFESTATION)** Under this approach, critical areas under heavy infestation, especially the grazing grounds near habitations, will be identified and treated.

The rehabilitation activities will start from the selected critical area that will act as nucleus, and will radiate from this nucleus to cover adjoining areas of high infestation. Major activities under this approach will be manual cutting of *Lantana* bushes, encouraging establishment of local species, including grasses and planting the areas with tall plants of fast growing species to quickly shade out *Lantana*.

The methodology to implement the above two approaches will be as follows:

- Method of cutting *Lantana* will be Cut Root Stock (CRS) method i.e. cutting the bushes below the soil to prevent coppicing. **(See box below for details).**
- **Forest beat** will be the unit for rehabilitating *Lantana* infested sites. Financial resources available under various schemes will, therefore, be converged towards this end.
- Local people, through existing community groups, will be encouraged to participate in rehabilitation of *Lantana* infested areas. Stake of local people will be built into this initiative under the available JFM instruments.
- The following will be, based on local practices, standardized for effective implementation of *Lantana* management initiative:
    - Cutting tools/ techniques
    - Calendar of rehabilitation activities
    - Cost models
- A three year active maintenance of the treated areas and triennial follow up thereafter will form integral part of the rehabilitation program till the areas gets fully rehabilitated. During this period, constant vigil will be maintained on any opportunistic springing back of sprouts/ seedlings of the invasive alien species and the same will be immediately removed. At the same time, progress of establishment of the native species will be actively monitored and encouraged.
- An average of 150 hectares of *Lantana* infested areas will be taken up for rehabilitation per year.



METHOD FOR REMOVAL OF LANTANA

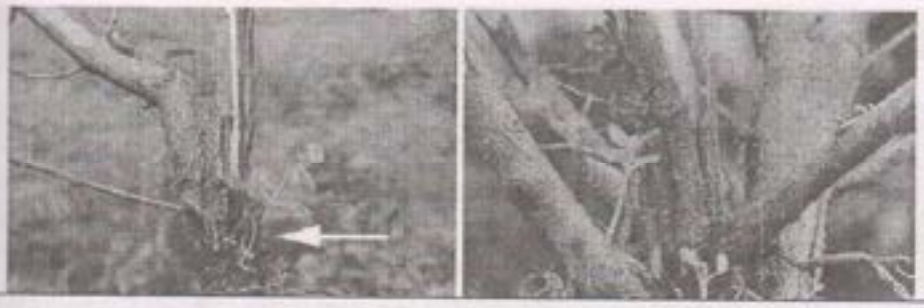
Removal of adult clumps using 'Cut Root Stock' (CRS) method: This method involves cutting the main rootstock of *Lantana* plant beneath the 'coppicing zone' (transition zone between stem base and rootstock) (Figure 1). This method of removal involves engagement of 2–3 individuals to work in a group for the removal of *Lantana* if the clumps are too large to be handled by one individual after the rootstock is cut. The steps involved in the cut rootstock method are:

(i) The person, who engages in removal of *Lantana*, is positioned in a way that he stands near centre of the *Lantana* clump with his back facing the clump and holding the handle of digger (kudal)

(ii) Using the specially designed digger, the person cuts the main rootstock of *Lantana* 3–5 cm below the soil surface by hitting the rootstock 3 or 4 times; while hitting the rootstock the blade of the digger gets lodged into the main tap root, and at this point it is useful to move the handle of the digger in the forward direction away from the body of the person so as to severe the connection of the clump with the main tap root. In case the clumps of *Lantana* form impenetrable thickets, it is advantageous to cut the rootstocks of 3–4 contiguous clumps to make the removal operation convenient. It may be noted that the branches of *Lantana* clumps should not be slashed/cut to gain access to the centre of the clump for its removal by cut rootstock method. The branches of *Lantana* thicket formed by more than one clump should be lifted and tipped over from one end by using a wooden or bamboo pole of about 1.5–2.5 m long and diameter 5–6 cm which is inserted just below the branches from one side and rolled over easily by two workers holding the pole at either end and pressing it so as to reach the centre of the clump Such manual handling of impenetrable thicket is possible because of the umbrella type of canopy which makes it difficult to reach the centre of clump easily. Such physical maneuvers minimize or prevent regeneration from rooted cut branches when they fall on the ground.

(iii) Lift the clump/s and place the clump/s upside down. If the clump is not placed upside down, the prostrate rooted branches and the aerial old branches having aerial roots at nodes may develop into adult plants when they come in contact with the soil. Therefore, the upside–down orientation of cut clumps is critical in the prevention of regeneration of *Lantana* from cut clumps. It may be noted that *Lantana* does not produce root suckers.

(iv) After drying the clumps, the clumps may be used as fuel or burnt at the same site or all the dried clumps may be collected at one place and then burnt. The best time for removal of *Lantana* is just before rainy season, i.e. when the plants are not in flowering and fruiting.



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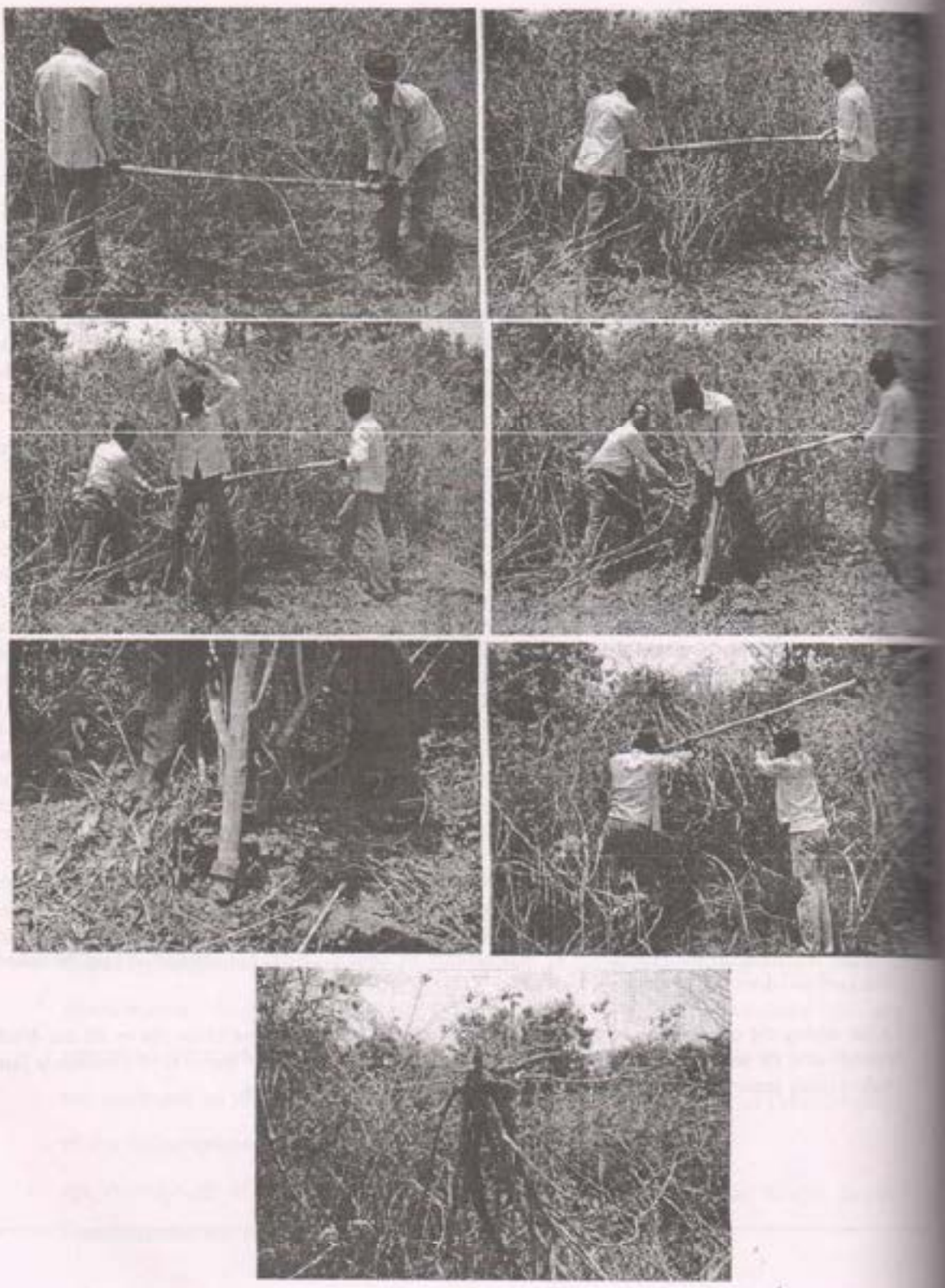

(b) MANAGEMENT OF OTHER INVASIVE ALIEN SPECIES (*PARTHENIUM, AGERATUM, EUPATORIUM*) The spread of these three species is largely restricted to the open lands including forest fringes, degraded pastures and areas having soils that are recently exposed due to landslips, erosion, soil cutting or muck dumping. The reconnaissance has shown that the there is a large overlap of areas under different invasive alien species with these three noxious weeds also occurring, though each of these occupying different niches, in most of the forests that are infested with *Lantana*.

The basic approach to rehabilitate areas infested with these three invasive species will be as under:

- **APPROACH-I (AREAS WHERE INFESTATION OVERLAPS WITH *LANTANA*):** Such situation occurs under Chil, miscellaneous broad-leaved and scrub forests. In such areas removal of these three exotic weeds will be taken up simultaneously with removal of *Lantana* and the treated areas rehabilitated with fast growing native species/ grasses.
- **APPROACH-II (AREAS WHERE THERE IS NO OR LITTLE *LANTANA* INFESTATION):** Such situation usually comes across in pastures, degraded forests and recently exposed sites. In such areas, manual uprooting of these exotic weeds just on the onset of monsoon, when the soil is moist, will be employed.

SOIL AND MOISTURE CONSERVATION The main objective is to protect hill slopes from further denudation, erosion and to maintain the equitable flow of water in the rivers, streams, perennial *nallas* that originate from these hills, thus constant efforts should be made to maintain and increase the protective vegetative cover in such areas. These forests shall, therefore, be simply protected as such. *No fellings shall be carried not even* salvage removals as these areas are highly prone to soil erosion owing to steep slopes. Comprehensive Catchment Area Treatment Plan has been made for Satluj basin which will guide the soil moisture conservation measures to be adopted in Bilaspur Division..

Map of Ranges with micro-watershed boundaries has been given here.

The grazing in these forests is required to be regulated. The rotational closures supplemented with some soil conservation measures in the eroded areas would improve protective vegetative cover. Most of the forests in lower elevations are poorly stocked, carry scattered tree growth or are devoid of adequate vegetation cover. Such areas shall

be tackled by sowing, planting of suitable species and carrying out soil conservation works. These forests can be regenerated by artificial means.

ENCROACHMENTS In recent years encroachment of forest land has emerged as a big threat to forest land. This is more so in UPF. However in PFs also the incidence of encroachment is not uncommon. Thus the boundary pillars of forests must be maintained regularly, if any shifting is noticed, action must be initiated immediately under IFA, 1927.

PREVENTIVE REMEDIAL MEASURES

- The forest officials must be well conversant with boundaries of the forests under their jurisdiction. The range officers, block officers and forest guards must check the boundary pillars frequently and in case of damage to boundary pillars, immediate legal action to punish the guilty and repair work should be undertaken on priority. DFO/ACF should also inspect the boundary pillars while inspecting forests, plantations and other forestry works.
- The old stone masonry pillars should be replaced with cement mortar after proper demarcation. The new boundary pillars of only cement mortar should be constructed in future.
- The field staff should be made accountable and sensitive towards the ever increasing menace of encroachments. The forest guard must initiate legal action as soon as the encroachment is noticed by him. He should chalk out the damage report and report the matter to range officer through block officer. The block officer should immediately seek demarcation and Chillan the case in the appropriate court. Range officer must act quickly to file the case in the court; the laxity at any level must be dealt with under CCS (CCA) Rules.
- All the encroachment cases on forest land are within the jurisdiction of DFO as collector of the division under H.P. Public Premises and Land (Eviction and Rent Recovery) Act, 1971. Range officers should challan all such cases before collector for speedy trial.
- The powers of carrying out demarcation are vested with the revenue officers under H.P.Land Revenue Act, 1954 and as such, many times, the demarcation of forests is delayed due to their pre-occupation. It is therefore, suggested that the

Tehsildar, Kanungo who are on deputation with the forest department be delegated the powers of demarcation of forests to process encroachment cases expeditiously.

STRATEGY

i) Repair all existing boundary pillars and construct more boundary pillars close to habitation. For this areas need to be identified that are prone to encroachments.

ii) Railway girders should be used in encroachment prone areas and all BP s should be depicted in digitized maps of the area which will be maintained a permanent record.

iii) As a deterrent, FIRs should be registered as soon as an encroachment is detected. Court proceedings will then follow.

iv) Latitude, longitude and altitude readings of all Boundary Pillars(old and new) to be recorded in the BP register and database in the Division office

ILLICIT FELLING With development of good network of roads, there has been an increase in incidences of illicit felling.

SMUGGLING OF TIMBER: - The high price of timber in the market has attracted/created tendency to become rich overnight and hence the smuggling of timber takes place more than often. The illicit felling and smuggling are both related, many times organized. The incidences of smuggling have, however, reduced after the amendment in Indian Forest Act (H.P.2nd Amendment 1991) vide which DFO has been designated as Authorized Officer to hear the cases pertaining to illegal transportation of Govt. property i.e. timber, resin,khairwood and katha and may order confiscation of both forest produce and the vehicle involved. The detail of cases admitted and decided in the court of Authorized Officer Bilaspur under 52A is given below:

Vehicle seized during smuggling of Forest produce.

FIR NO. and date.	Vehicle No.	Forest property seized.	Remarks.
2/2002 dated 2.1.2002	HIH 557	50 No. Resin filled Tins	Vehical released on Supurdari Bound and case Under Trial A.O.
108/2003 dated 15.3.2003	HP-28 -1628	19 resin filled Tins	Under trial A.O.
16/2006 dated 12.1.2006	HP 69-0112	31 Khair Logs	-do-
128/2008 dated 28-3-2008	HP-51B0408 Mohindra Pick Up HP 14 B-T-5328 Indica Car.	32 Khair Logs	-do-
23/2009 dated 7.2.2009	HP-20-8840	30 Khiar Logs	-do-
226/2010 dated 20.11.2010.	HP24 -3773	7 Deodar scants	-do-
24/2011 dated 13.3.2011	HP23B-5143	17 Khair Logs	-do-
Nil dated 5.4.2011.	HP67-0698	14 Khair logs	-do-

(Source: Office Record, DFO Bilaspur)

STRATEGY

i) **VAN THANA BASSI:** One Van Thana has been established in inter-state border area i.e. Bassi Block of Swarghat Range of this Division which which will control the illegal activities along the border areas and this Van Thana team is to be provided with vehicle, weapon and with effective and adequate communication equipments and will be exclusively responsible for protection works including illicit felling, illegal mining, encroachments, forest fires, wildlife poaching etc.

ii) The offences so detected by Van Thana team is to be properly and promptly dealt under the Van Thana Rules notified by the Govt. of H.P. from time to time and stringent action against offender will act as a deterrent.

iii) Whenever any vehicle is apprehended or timber is seized, that should be disposed off immediately (after seeking permission from court) before there is any depreciation in the value.

Record of Treatment and Statistics of Growth: - The record of treatment, statistics of yield and inspection notes will be kept in the respective compartment history files.

CHAPTER – IV

THE PLANTATION WORKING CIRCLE

4.1 General Constitution: - The Plantation Working Circle includes areas suitable for planting of valuable and economically important species. The forests allotted to this Working Circle are generally bare or containing inferior dry scrub and brushwood crop which is uneconomical from harvesting point of view. Existing plantations of Chil, Khair and other species not established so far are also included in this Working Circle. The areas of fuelwood working circle of the working plan under revision, where crop density is poor and are considered fit for afforestation have also been included in this Working Circle.

4.2 General Character of Vegetation: - The majority of the areas included in this Working Circle belong to the Northern Dry Mixed Deciduous Forest Type 5BC2 and its degraded stage D.S.l.(Dry Deciduous Scrub Forest). Composition and characteristics of the vegetation has been described in detail in Chapter-II of Part I of this Working Plan. Other areas included of this Working Circle are either grassy blanks or bear a scrub crop of Garna, Mehandu with a few scattered Chil and other miscellaneous trees. In some areas bits of Eucalyptus plantations having stunted growth also exist.

4.3 Special Objects Of Management:-

The special objects of management are:-

- ✓ To maintain and improve the existing plantations by under taking the cultural and beating up of failures operations.
- ✓ To plant up treeless areas with economically valuable tree species like Chil, Khair, Bamboos, Semal, Kachnar, Bahera, Harer, Shisham etc.
- ✓ To get rid of weeds like Thor, Lantana and other inferior brushwood species.
- ✓ To introduce more economically valuable tree species suited to the locality in the existing Eucalyptus plantations of stunted growth.

4.4 Block and Compartments: - Clearly defined blocks, compartments and sub compartments exist in the case of Demarcated Protected Forests and the method of naming these blocks and compartment has been explained in Chapter-I Part-II. However in the case of Undemarcated Protected Forests which have not been surveyed and mapped, no such arrangement was possible and hence name of the village has been given to the UPF in which it exists.

4.5 Area and Allotment: - The total area of this Working Circle is 17061.01 ha out of which 58.80 hac. area is reserve forest, 6970.60 ha are of Demarcated Protected Forests and 10031.55 ha of Undemarcated Protected Forests. These areas have been selected and included in this Working Circle keeping in view their suitability judged form the depth of soil or the zone of root penetration during field inspections.

The areas are generally very refractory. This combined with very hot and dry summers is one of the greatest inhibiting factors causing large scale failures of plantation efforts. Unfortunately, the plantations raised in the past have not fared well and many of the areas need complete replanting. Unless quick and impressive results are got, the people do not agree for the closure of the plantation areas. The grazing demands of the right holders are to be kept in view while affecting closures of the areas selected for raising plantations. Otherwise there is every likelihood of the plantation being grazed or destroyed. The choice regarding inclusion of areas in this Working Circle has, therefore, been kept intentionally low to ensure success.

4.6 Analysis and Evaluation of the Crop: - The forests allotted to this Working Circle have been stock mapped on 1:15000 scale. These stock maps have been placed in the respective compartment history files on which types of vegetation has been indicated.

4.7 Area Statement:

TABLE 4.2

RANGE-WISE AREAS ALLOTED TO PLANTATION WORKING CIRCLE

Sr. No	Range	Block	Type of Forest	Name of Forests	Area in ha.
1	Sadar	Brahampukhar	R.F.	C 1 Bahadurpur	58.80
			Total:		58.80
1	Bharari	Nihari	D.P.F.	C 2c Dangar-I	2.58
2	Bharari	Nihari	D.P.F.	C 2f Hari Talyanger-I	7.43
3	Bharari	Mohra	D.P.F.	C 15b Kotlu	3.36
4	Bharari	Bharari	D.P.F.	Lehri Sarel	3.63
5	Bharari	Bharari	D.P.F.	Lanjhta	2.80
6	Bharari	Bharari	D.P.F.	Jarora-II	1.86
7	Bharari	Mohra	D.P.F.	Panyala-I	7.45
8	Bharari	Mohra	D.P.F.	Panyala-III	6.50
9	Bharari	Mohra	D.P.F.	Panyala-II	7.93
10	Bharari	Mohra	D.P.F.	Doon-I	3.47
11	Bharari	Mohra	D.P.F.	Doon-II	4.90
12	Bharari	Mohra	D.P.F.	Doon-III	2.77
13	Bharari	Mohra	D.P.F.	Doon-V	2.85
14	Bharari	Bharari	D.P.F.	Taraun	2.30
15	Bharari	Bharari	D.P.F.	Barota	1.63
16	Bharari	Bharari	D.P.F.	Lanjhta	1.55
17	Bharari	Bharari	D.P.F.	Haritalyangar-III	2.26
18	Bharari	Mohra	D.P.F.	Karloti-II	4.75
19	Bharari	Mohra	D.P.F.	Chat-I	4.56
20	Bharari	Mohra	D.P.F.	Chat-II	7.23
21	Bharari	Bharari	D.P.F.	Khet	6.25
22	Bharari	Mohra	D.P.F.	C 1a Plasla	118.00
23	Bharari	Mohra	D.P.F.	C 1b Plasla	102.80
			Total:		308.67

1	Ghumarwin	Ghumarwin	D.P.F.	C 18 Sadyar	121.20
2	Ghumarwin	Harlog	D.P.F.	C1 Umari	47.20
3	Ghumarwin	Harlog	D.P.F.	C2 Umari	46.00
4	Ghumarwin	Harlog	D.P.F.	C3 Dhangoo	144.80
5	Ghumarwin	Harlog	D.P.F.	C4 Ghan	166.80
6	Ghumarwin	Harlog	D.P.F.	C 6 Jol	62.00
7	Ghumarwin	Harlog	D.P.F.	C 7 Rohan	153.20
8	Ghumarwin	Harlog	D.P.F.	C 8 Nain	71.60
9	Ghumarwin	Harlog	D.P.F.	C 10 Balh Churani	80.40
10	Ghumarwin	Harlog	D.P.F.	C 11 Malyawar	85.60
11	Ghumarwin	Paniyala	D.P.F.	C 1 Osal	32.40
12	Ghumarwin	Paniyala	D.P.F.	C 3a Paniala	71.20
13	Ghumarwin	Paniyala	D.P.F.	C 3b Paniala	9.44
14	Ghumarwin	Paniyala	D.P.F.	C 4c Dari	2.25
15	Ghumarwin	Paniyala	D.P.F.	C 5b Kulleri	78.00
16	Ghumarwin	Ghumarwin	D.P.F.	C 5c Silh	1.96
17	Ghumarwin	Ghumarwin	D.P.F.	C5d Nain-I	4.83
18	Ghumarwin	Ghumarwin	D.P.F.	C 5e Nain-II	5.44
19	Ghumarwin	Ghumarwin	D.P.F.	C 5f Nain-III	5.25
20	Ghumarwin	Paniyala	D.P.F.	C 6b Dhugli	26.00
21	Ghumarwin	Ghumarwin	D.P.F.	C 7a Pheti Dhar	105.60
22	Ghumarwin	Ghumarwin	D.P.F.	C 7 b Kiari-I	1.90
23	Ghumarwin	Ghumarwin	D.P.F.	C 7c Kiari-II	1.55
24	Ghumarwin	Ghumarwin	D.P.F.	C 8 Pheti Dhar	93.00
25	Ghumarwin	Ghumarwin	D.P.F.	C 9 Trontra	2.62
26	Ghumarwin	Ghumarwin	D.P.F.	C 10 Rachhera	5.67
27	Ghumarwin	Paniyala	D.P.F.	C 11 Glassi	3.12
28	Ghumarwin	Ghumarwin	D.P.F.	C 1b Ballu Kharyala	9.96
29	Ghumarwin	Ghumarwin	D.P.F.	Mohin-II	9.97
30	Ghumarwin	Ghumarwin	D.P.F.	Barota-II	2.51
31	Ghumarwin	Ghumarwin	D.P.F.	Rali-III	2.83
32	Ghumarwin	Ghumarwin	D.P.F.	Balhu-Kharyala	4.38
33	Ghumarwin	Ghumarwin	D.P.F.	Rachhera-III	6.00

34	Ghumarwin	Ghumarwin	D.P.F.	Panoh	4.28
35	Ghumarwin	Ghumarwin	D.P.F.	Takrera-I	2.41
36	Ghumarwin	Ghumarwin	D.P.F.	Rohin-I	2.03
37	Ghumarwin	Ghumarwin	D.P.F.	Rohin-II	5.12
38	Ghumarwin	Ghumarwin	D.P.F.	Rohin-IV	1.29
39	Ghumarwin	Ghumarwin	D.P.F.	Rohin-V	6.05
40	Ghumarwin	Ghumarwin	D.P.F.	Rohin-VI	4.00
41	Ghumarwin	Ghumarwin	D.P.F.	Amarpur-I	25.54
42	Ghumarwin	Ghumarwin	D.P.F.	Amarpur-II	25.26
43	Ghumarwin	Ghumarwin	D.P.F.	Amarpur-III	12.34
44	Ghumarwin	Harlog	D.P.F.	Chalehli-I	4.04
45	Ghumarwin	Harlog	D.P.F.	Chalehli-II	2.43
46	Ghumarwin	Ghumarwin	D.P.F.	Kseh	5.35
47	Ghumarwin	Paniyala	D.P.F.	Nurhali	4.75
48	Ghumarwin	Ghumarwin	D.P.F.	Takrera-II	2.81
49	Ghumarwin	Harlog	D.P.F.	C 12 Chaleli	15.60
50	Ghumarwin	Harlog	D.P.F.	C 5 a Kulleri Ka Chali	3.20
			Total:		**1591.18**
1	Jhandutta	Samoh	D.P.F.	Tihri	3.92
2	Jhandutta	Samoh	D.P.F.	Jajar	3.13
3	Jhandutta	Samoh	D.P.F.	C 3b Raily-II	5.93
4	Jhandutta	Samoh	D.P.F.	C3c Raily -I	5.33
5	Jhandutta	Samoh	D.P.F.	C7 Bagra	72.00
6	Jhandutta	Samoh	D.P.F.	C8a Bidwin	42.40
7	Jhandutta	Samoh	D.P.F.	C8b Gherwin-V	3.60
8	Jhandutta	Samoh	D.P.F.	C8c Gherwin-II	3.36
9	Jhandutta	Samoh	D.P.F.	C8d Gherwin-III	5.56
10	Jhandutta	Samoh	D.P.F.	C8e Gherwin-I	8.17
11	Jhandutta	Samoh	D.P.F.	C8f Gherwin-IV	4.17
12	Jhandutta	Samoh	D.P.F.	C8g Dafer	15.80
13	Jhandutta	Samoh	D.P.F.	C8h Dahad	17.34
14	Jhandutta	Samoh	D.P.F.	C10b Tungri-I	6.01
15	Jhandutta	Samoh	D.P.F.	C10c Tungri-II	2.15

16	Jhandutta	Samoh	D.P.F.	C11a Baroa-I	3.75
17	Jhandutta	Samoh	D.P.F.	C13b Ser-II	3.04
18	Jhandutta	Samoh	D.P.F.	C14 Ghanyar	8.97
19	Jhandutta	Samoh	D.P.F.	C3 Sidh Nalian	76.80
20	Jhandutta	Samoh	D.P.F.	C4 Jhoru	102.00
21	Jhandutta	Samoh	D.P.F.	C5 b Kangral	50.00
22	Jhandutta	Samoh	D.P.F.	C6a Makhwin	18.48
23	Jhandutta	Samoh	D.P.F.	C6b Makhwin	3.70
24	Jhandutta	Jhandutta	D.P.F.	C4a Khurjal	7.20
25	Jhandutta	Jhandutta	D.P.F.	C4b Materi	6.80
26	Jhandutta	Jhandutta	D.P.F.	C5 Bhaga	9.60
27	Jhandutta	Gochar	D.P.F.	C5d Jhamradian	3.74
28	Jhandutta	Jhandutta	D.P.F.	C13 Berthin	1.78
29	Jhandutta	Samoh	D.P.F.	Samoh-II	5.52
30	Jhandutta	Samoh	D.P.F.	Tikari-I	25.55
31	Jhandutta	Samoh	D.P.F.	Tikari-II	6.43
32	Jhandutta	Samoh	D.P.F.	Tikari-III	2.39
33	Jhandutta	Samoh	D.P.F.	Badol-I	6.61
34	Jhandutta	Gochar	D.P.F.	Kallar	13.56
35	Jhandutta	Jhandutta	D.P.F.	Behran-I	3.73
36	Jhandutta	Jhandutta	D.P.F.	Behran-III	10.81
37	Jhandutta	Jhandutta	D.P.F.	Amroha-I	3.74
38	Jhandutta	Jhandutta	D.P.F.	Lehar-I	5.25
39	Jhandutta	Jhandutta	D.P.F.	Lehar-II	4.31
40	Jhandutta	Jhandutta	D.P.F.	Lehar-III	2.11
41	Jhandutta	Jhandutta	D.P.F.	Nahral	2.48
42	Jhandutta	Jhandutta	D.P.F.	Nand-I	5.61
43	Jhandutta	Jhandutta	D.P.F.	Nand-II	4.13
44	Jhandutta	Jhandutta	D.P.F.	Nand-III	3.89
45	Jhandutta	Jhandutta	D.P.F.	Rohal-III	1.54
46	Jhandutta	Jhandutta	D.P.F.	Rohal-IV	1.38
47	Jhandutta	Jhandutta	D.P.F.	Dharad-I	3.54
48	Jhandutta	Jhandutta	D.P.F.	Dharad-II	3.43

49	Jhandutta	Samoh	D.P.F.	Bhadol-I	1.99
50	Jhandutta	Jhandutta	D.P.F.	Parahu-I	33.47
51	Jhandutta	Gochar	D.P.F.	Malangan-II	22.36
52	Jhandutta	Jhandutta	D.P.F.	Kharota	2.63
53	Jhandutta	Jhandutta	D.P.F.	Dol-lasawan-I	3.84
54	Jhandutta	Jhandutta	D.P.F.	Dol-lasawan-II	28.76
55	Jhandutta	Jhandutta	D.P.F.	Sangaswin	12.05
56	Jhandutta	Samoh	D.P.F.	Poli-I	15.39
57	Jhandutta	Samoh	D.P.F.	Poli-II	3.60
58	Jhandutta	Samoh	D.P.F.	Poli-III	5.25
59	Jhandutta	Samoh	D.P.F.	Poli-IV	0.97
60	Jhandutta	Samoh	D.P.F.	Kohina-I	9.23
61	Jhandutta	Samoh	D.P.F.	Kohina-II	4.58
62	Jhandutta	Jhandutta	D.P.F.	Fagog-I	10.51
63	Jhandutta	Jhandutta	D.P.F.	Fagog-II	2.02
64	Jhandutta	Gochar	D.P.F.	Balhsina -III	10.88
65	Jhandutta	Samoh	D.P.F.	Mushahn	3.23
66	Jhandutta	Jhandutta	D.P.F.	Tihri-I	3.48
67	Jhandutta	Jhandutta	D.P.F.	Tihri-II	2.46
68	Jhandutta	Samoh	D.P.F.	Khalsai-I	2.68
69	Jhandutta	Samoh	D.P.F.	Khalsai-II	1.65
70	Jhandutta	Samoh	D.P.F.	Khalsai-III	7.79
71	Jhandutta	Samoh	D.P.F.	Khalsai-IV	7.27
72	Jhandutta	Samoh	D.P.F.	Rachera-I	31.34
73	Jhandutta	Samoh	D.P.F.	Rachera-II	4.16
74	Jhandutta	Samoh	D.P.F.	Luhard-I	20.10
75	Jhandutta	Samoh	D.P.F.	Luhard-II	7.09
76	Jhandutta	Samoh	D.P.F.	Matla-I	3.15
77	Jhandutta	Samoh	D.P.F.	Matla-II	2.63
78	Jhandutta	Samoh	D.P.F.	Dari Bhari-I	2.56
79	Jhandutta	Jhandutta	D.P.F.	Balgarh-I	3.43
80	Jhandutta	Jhandutta	D.P.F.	Balgarh-II	7.26
81	Jhandutta	Jhandutta	D.P.F.	Balgarh-III	5.07

82	Jhandutta	Jhandutta	D.P.F.	Balgarh-IV	60.66
83	Jhandutta	Jhandutta	D.P.F.	Balgarh-V	10.57
84	Jhandutta	Jhandutta	D.P.F.	Balgarh-VI	8.19
85	Jhandutta	Jhandutta	D.P.F.	Bhatoli-I	2.39
86	Jhandutta	Gochar	D.P.F.	Kallar	1.54
87	Jhandutta	Jhandutta	D.P.F.	Jhareri	13.92
88	Jhandutta	Jhandutta	D.P.F.	Dharoti	2.66
89	Jhandutta	Jhandutta	D.P.F.	Randoh-I	4.98
90	Jhandutta	Jhandutta	D.P.F.	Randoh-II	1.98
91	Jhandutta	Jhandutta	D.P.F.	Bhatoli-II	1.38
92	Jhandutta	Samoh	D.P.F.	Dhararsani-I	2.13
93	Jhandutta	Samoh	D.P.F.	Dhararsani-II	2.15
94	Jhandutta	Samoh	D.P.F.	C10a Tungri	4.00
95	Jhandutta	Jhandutta	D.P.F.	C7b Jhaula	24.00
96	Jhandutta	Gochar	D.P.F.	C1a Kallar	22.00
97	Jhandutta	Gochar	D.P.F.	C3a Gandir	28.00
98	Jhandutta	Gochar	D.P.F.	Malangan-I	13.98
99	Jhandutta	Gochar	D.P.F.	Malari -II	6.11
			Total:		**1104.31**
1	Kalol	Bachhretu	D.P.F.	C1 Wansa	95.20
2	Kalol	Bachhretu	D.P.F.	C5 Boungar	26.49
3	Kalol	Bachhretu	D.P.F.	C8 Anti	114.80
4	Kalol	Malhot	D.P.F.	C10 Mareta	8.80
5	Kalol	Malhot	D.P.F.	C11 Durghat	14.80
6	Kalol	Kalol	D.P.F.	C18 Jhujnoo	5.20
7	Kalol	Kalol	D.P.F.	C22 Bharoli Kalan	36.00
8	Kalol	Kalol	D.P.F.	C23 Bharoli	2.80
9	Kalol	Bachhretu	D.P.F.	C25 Gharan	5.20
10	Kalol	Bachhretu	D.P.F.	C26 Manjher	4.80
11	Kalol	Bachhretu	D.P.F.	C27 Gangloh	12.00
12	Kalol	Bachhretu	D.P.F.	Bhagatpur	2.15
13	Kalol	Kalol	D.P.F.	Bakain-I	6.41
14	Kalol	Kalol	D.P.F.	Bakain-II	5.72

15	Kalol	Kalol	D.P.F.	Bakain-III	2.64
16	Kalol	Kalol	D.P.F.	Bakain-IV	5.00
17	Kalol	Kalol	D.P.F.	Bakain-V	1.83
18	Kalol	Malhot	D.P.F.	Suh-I	26.85
19	Kalol	Malhot	D.P.F.	Suh-II	1.31
20	Kalol	Malhot	D.P.F.	Droh	8.67
21	Kalol	Kalol	D.P.F.	Tihri -I	32.19
22	Kalol	Malhot	D.P.F.	Balthrin	30.12
23	Kalol	Malhot	D.P.F.	Droh	8.68
24	Kalol	Kalol	D.P.F.	Bhadoli Khurd	10.54
25	Kalol	Kalol	D.P.F.	Jhreri-I	4.85
26	Kalol	Kalol	D.P.F.	Jhreri-II	7.05
27	Kalol	Kalol	D.P.F.	Jhreri-III	2.06
28	Kalol	Kalol	D.P.F.	Sunihera-I	7.19
29	Kalol	Kalol	D.P.F.	Sunihera-II	6.28
30	Kalol	Malhot	D.P.F.	Dhaonoula	32.40
31	Kalol	Kalol	D.P.F.	Paploha	46.55
32	Kalol	Malhot	D.P.F.	Dhani	53.20
33	Kalol	Malhot	D.P.F.	Kot-I	30.06
34	Kalol	Malhot	D.P.F.	Kot-II	30.68
35	Kalol	Malhot	D.P.F.	Kharli-I	66.40
36	Kalol	Malhot	D.P.F.	Kharli-II	38.64
37	Kalol	Malhot	D.P.F.	Kharli-III	47.97
38	Kalol	Malhot	D.P.F.	Kharli-IV	19.08
39	Kalol	Malhot	D.P.F.	C12 Tarkhola	1.60
40	Kalol	Bachhretu	D.P.F.	C24 Khamera Khurd	4.80
41	Kalol	Kalol	D.P.F.	C32 Johar Khas	48.00
42	Kalol	Malhot	D.P.F.	C3 Bagphal	198.00
43	Kalol	Malhot	D.P.F.	C7 Malhot Godam	4.80
44	Kalol	Baseh	D.P.F.	C8 Kot Godam	7.60
			Total:		**1125.43**
1	Sadar	Sadar	D.P.F.	C 1a Sungal	24.77
2	Sadar	Sadar	D.P.F.	C 1b Badsour	36.45

3	Sadar	Sadar	D.P.F.	C 2 Dali	80.10
4	Sadar	Sadar	D.P.F.	C 3 Jhaleda	93.20
5	Sadar	Sadar	D.P.F.	C 5b Buryans	90.00
6	Sadar	Sadar	D.P.F.	C 6 Nichali Bhater	3.12
7	Sadar	Sadar	D.P.F.	C 7 Salnoo	2.82
8	Sadar	Panjgain	D.P.F.	C 1c Jamthal	70.80
9	Sadar	Panjgain	D.P.F.	C 1d Jamthal	75.00
10	Sadar	Panjgain	D.P.F.	C 2a Chamyoun	100.20
11	Sadar	Panjgain	D.P.F.	C 2c Jamthal	179.60
12	Sadar	Panjgain	D.P.F.	C 3 Sangan	191.42
13	Sadar	Panjgain	D.P.F.	C 5 Samleu	8.65
14	Sadar	Panjgain	D.P.F.	C 6 Dobba	5.37
15	Sadar	Sadar	D.P.F.	C 7a Sarad-II	20.63
16	Sadar	Sadar	D.P.F.	C 7b Sarad-II	6.59
17	Sadar	Panjgain	D.P.F.	C 8 Panjgain	4.05
18	Sadar	Sadar	D.P.F.	C 9 Punehan	5.74
19	Sadar	Panjgain	D.P.F.	Sai Brahamna-I	1.81
20	Sadar	Panjgain	D.P.F.	Bhadetar-III	2.71
21	Sadar	Panjgain	D.P.F.	Bhadetar-II	11.63
22	Sadar	Panjgain	D.P.F.	Tikari	2.32
23	Sadar	Sadar	D.P.F.	Dhamna	31.70
24	Sadar	Sadar	D.P.F.	Bandla-I	65.93
25	Sadar	Sadar	D.P.F.	Bandla-II	98.60
26	Sadar	Sadar	D.P.F.	Bandla-III	64.45
27	Sadar	Sadar	D.P.F.	Bandla-IV	2.02
28	Sadar	Sadar	D.P.F.	Bandla-V	1.57
29	Sadar	Panjgain	D.P.F.	Karot-I	84.93
30	Sadar	Panjgain	D.P.F.	Karot-II	9.24
31	Sadar	Sadar	D.P.F.	Jinanu	3.02
32	Sadar	Sadar	D.P.F.	Sandoli-I	6.46
33	Sadar	Sadar	D.P.F.	Binola-II	43.15
34	Sadar	Sadar	D.P.F.	Parnali-I	114.61
35	Sadar	Sadar	D.P.F.	Parnali-II	8.26

36	Sadar	Brahampukhar	D.P.F.	Ghial-I	6.22
37	Sadar	Brahampukhar	D.P.F.	Ghial-II	1.29
38	Sadar	Sadar	D.P.F.	Luhnu Kanaita -I	1.72
39	Sadar	Sadar	D.P.F.	Luhnu Kanaita -II	2.56
40	Sadar	Sadar	D.P.F.	Lunnu Kanaita-III	6.60
41	Sadar	Sadar	D.P.F.	Deoli- I	16.39
42	Sadar	Sadar	D.P.F.	Deoli- II	4.74
43	Sadar	Sadar	D.P.F.	Deoli-III	3.56
44	Sadar	Sadar	D.P.F.	Deoli-IV	15.82
45	Sadar	Sadar	D.P.F.	Barog-I	3.79
46	Sadar	Sadar	D.P.F.	Barog-II	40.36
47	Sadar	Sadar	D.P.F.	Sungal	34.05
48	Sadar	Brahampukhar	D.P.F.	Kuhal kattal	5.38
49	Sadar	Brahampukhar	D.P.F.	Pohni-I	9.22
50	Sadar	Brahampukhar	D.P.F.	Pohni-II	4.90
51	Sadar	Sadar	D.P.F.	Makri-I	3.96
52	Sadar	Sadar	D.P.F.	Makri-II	3.56
53	Sadar	Sadar	D.P.F.	Dalta	1.90
54	Sadar	Brahampukhar	D.P.F.	Gutrahan-I	10.37
55	Sadar	Brahampukhar	D.P.F.	Gutrahan-II	3.52
56	Sadar	Brahampukhar	D.P.F.	Gutrahan-III	4.72
57	Sadar	Panjgain	D.P.F.	Kharsi Kanaita -I	1.30
58	Sadar	Panjgain	D.P.F.	Kharsi Kanaita -II	7.66
59	Sadar	Panjgain	D.P.F.	Kharsi Kanaita-III	1.40
60	Sadar	Panjgain	D.P.F.	Kharsi Kanaita -IV	3.24
61	Sadar	Sadar	D.P.F.	Thohru-I	21.60
62	Sadar	Sadar	D.P.F.	Thohru-II	4.30
63	Sadar	Panjgain	D.P.F.	Lungari Kanetan	17.22
64	Sadar	Sadar	D.P.F.	Chamlog	1.94
65	Sadar	Brahampukhar	D.P.F.	Manjher-I	4.74
66	Sadar	Panjgain	D.P.F.	Kamlota	2.26
67	Sadar	Panjgain	D.P.F.	Sangrana-I	7.34
68	Sadar	Brahampukhar	D.P.F.	Sumari-III	1.94

69	Sadar	Brahampukhar	D.P.F.	Bag Khurd	3.64
70	Sadar	Sadar	D.P.F.	Kanjota	1.02
71	Sadar	Sadar	D.P.F.	Kathpur	1.38
72	Sadar	Sadar	D.P.F.	Mangrot-I	40.74
73	Sadar	Sadar	D.P.F.	Mangrot-II	16.68
74	Sadar	Sadar	D.P.F.	Baggi	20.27
75	Sadar	Brahampukhar	D.P.F.	Kahali	6.24
76	Sadar	Brahampukhar	D.P.F.	Soshan-I	3.18
77	Sadar	Brahampukhar	D.P.F.	Soshan-II	2.84
78	Sadar	Brahampukhar	D.P.F.	Soshan-III	1.03
79	Sadar	Brahampukhar	D.P.F.	Dagsech-I	2.73
80	Sadar	Brahampukhar	D.P.F.	Dagsech-II	2.94
81	Sadar	Brahampukhar	D.P.F.	Dagsech-III	13.94
82	Sadar	Brahampukhar	D.P.F.	Palog-I	7.73
83	Sadar	Brahampukhar	D.P.F.	Palog-II	2.99
84	Sadar	Brahampukhar	D.P.F.	Palog-III	3.04
85	Sadar	Brahampukhar	D.P.F.	Dadog-I	1.45
86	Sadar	Brahampukhar	D.P.F.	Dadog-II	1.32
87	Sadar	Brahampukhar	D.P.F.	Kotla	2.11
88	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-I	3.13
89	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-II	24.83
90	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-III	3.31
91	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-IV	2.05
92	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-V	2.11
93	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-VI	7.55
94	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-VII	2.73
95	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-VIII	3.45
96	Sadar	Brahampukhar	D.P.F.	Niharkhan Basla-IX	1.37
97	Sadar	Brahampukhar	D.P.F.	Kothi-I	14.21
98	Sadar	Brahampukhar	D.P.F.	Kothi-II	18.41
99	Sadar	Brahampukhar	D.P.F.	Dunglu-I	4.21
100	Sadar	Brahampukhar	D.P.F.	Dunglu-II	2.37
101	Sadar	Brahampukhar	D.P.F.	DunguJII	1.60

102	Sadar	Brahampukhar	D.P.F.	Sai Noduwan-I	7.40
103	Sadar	Brahampukhar	D.P.F.	Sai Noduwan-II	8.14
104	Sadar	Sadar	D.P.F.	Sihra-I	5.79
105	Sadar	Sadar	D.P.F.	Sihra-II	7.39
106	Sadar	Panjgain	D.P.F.	Panjail Khurd	13.16
107	Sadar	Panjgain	D.P.F.	Sakroha	3.74
108	Sadar	Panjgain	D.P.F.	Jamthal-I	43.06
109	Sadar	Panjgain	D.P.F.	Jamthal-II	23.63
110	Sadar	Panjgain	D.P.F.	Jamthal-III	5.78
111	Sadar	Panjgain	D.P.F.	Kolnu-I	4.35
112	Sadar	Panjgain	D.P.F.	Kolnu-II	5.20
113	Sadar	Panjgain	D.P.F.	Neri	7.34
114	Sadar	Panjgain	D.P.F.	Behli	3.71
115	Sadar	Brahampukhar	D.P.F.	Khalota	1.03
116	Sadar	Panjgain	D.P.F.	Chanjota-I	6.94
117	Sadar	Panjgain	D.P.F.	Chanjota-II	3.60
118	Sadar	Panjgain	D.P.F.	Janer-I	9.95
119	Sadar	Panjgain	D.P.F.	Janer-II	2.85
120	Sadar	Panjgain	D.P.F.	Galod	14.11
121	Sadar	Panjgain	D.P.F.	Ghanser	1.58
122	Sadar	Sadar	D.P.F.	C 4 Buryans	154.00
123	Sadar	Sadar	D.P.F.	C 5a Buryans	88.40
124	Sadar	Panjgain	D.P.F.	C 1b Jamthal	90.00
125	Sadar	Panjgain	D.P.F.	C 2b Chamyoun	39.80
			Total:		**2587.49**
1	Swarghat	Swarghat	D.P.F.	C 11 Jajjar	101.60
2	*Swarghat*	*Rattanpur*	*D.P.F.*	*C 1 Jamli*	*59.58*
3	*Swarghat*	*Swahan*	*D.P.F.*	*C 10 Dadnal*	*25.60*
4	*Swarghat*	*Swahan*	*D.P.F.*	*C 12 Dindroo*	66.80
			Total:		**253.58**
1	Bharari	Mohra	U.P.F.	UPF Kotlu	1.00
2	Bharari	Bharari	U.P.F.	UPF Lehari Seral-II	2.69
3	Bharari	Bharari	U.P.F.	UPF Barog	6.63

4	Bharari	Mohra	U.P.F.	UPF Paniala-III	17.00
5	Bharari	Mohra	U.P.F.	UPF Karloti-II	3.95
6	Bharari	Mohra	U.P.F.	UPF Makra	9.00
7	Bharari	Mohra	U.P.F.	UPF Galian	5.26
8	Bharari	Mohra	U.P.F.	UPF Mundkhar	7.56
9	Bharari	Mohra	U.P.F.	UPF Mohra	13.00
10	Bharari	Mohra	U.P.F.	UPF Junala	6.05
11	Bharari	Mohra	U.P.F.	UPF Khungan	11.36
12	Bharari	Mohra	U.P.F.	UPF Chhat-III	5.25
13	Bharari	Mohra	U.P.F.	UPF Kotlu Brahmna	29.70
14	Bharari	Mohra	U.P.F.	UPF Karyalag	7.90
15	Bharari	Mohra	U.P.F.	UPF Kuthalag	11.00
16	Bharari	Bharari	U.P.F.	UPF Hatwar	1.68
17	Bharari	Mohra	U.P.F.	UPF Jari	4.60
18	Bharari	Mohra	U.P.F.	UPF Paplah	12.43
19	Bharari	Mohra	U.P.F.	UPF Sunali	26.43
20	Bharari	Mohra	U.P.F.	UPF Kuthakar	8.75
21	Bharari	Mohra	U.P.F.	UPF Naswal	2.80
22	Bharari	Mohra	U.P.F.	UPF Himar	21.93
			Total:		**215.97**
1	Ghumarwin	Ghumarwin	U.P.F.	UPF Duhak	4.10
2	Ghumarwin	Ghumarwin	U.P.F.	UPF Sunhani	8.74
3	Ghumarwin	Ghumarwin	U.P.F.	UPF Bard	3.12
4	Ghumarwin	Ghumarwin	U.P.F.	UPF Barimajherwan	22.00
5	Ghumarwin	Ghumarwin	U.P.F.	UPF Karangora	7.11
6	Ghumarwin	Ghumarwin	U.P.F.	UPF Chehri	11.18
7	Ghumarwin	Harlog	U.P.F.	UPF Hawani	5.87
8	Ghumarwin	Harlog	U.P.F.	UPF Ropakulatar	4.68
9	Ghumarwin	Harlog	U.P.F.	UPF Drolla	12.82
10	Ghumarwin	Harlog	U.P.F.	UPF Palela	12.30

11	Ghumarwin	Harlog	U.P.F.	UPF Ladha	19.20
12	Ghumarwin	Harlog	U.P.F.	UPF Jabliana	33.17
13	Ghumarwin	Harlog	U.P.F.	UPF Bal Churani-I	2.11
14	Ghumarwin	Harlog	U.P.F.	UPF Bal Churani-II	3.31
15	Ghumarwin	Harlog	U.P.F.	UPF Chhujala	2.74
16	Ghumarwin	Harlog	U.P.F.	UPF Nanowan	2.38
17	Ghumarwin	Harlog	U.P.F.	UPF Sakroha	9.40
18	Ghumarwin	Harlog	U.P.F.	UPF Malyawar	11.20
19	Ghumarwin	Harlog	U.P.F.	UPF Muthani	40.61
20	Ghumarwin	Harlog	U.P.F.	UPF Nain Gujran	3.36
21	Ghumarwin	Harlog	U.P.F.	UPF Baldwara	4.07
22	Ghumarwin	Harlog	U.P.F.	UPF Salon Mandal	13.00
23	Ghumarwin	Ghumarwin	U.P.F.	UPF Bakroa	5.62
24	Ghumarwin	Ghumarwin	U.P.F.	UPF Bhager	29.81
25	Ghumarwin	Ghumarwin	U.P.F.	UPF Dakri	8.65
26	Ghumarwin	Ghumarwin	U.P.F.	UPF Tikkari	7.67
27	Ghumarwin	Ghumarwin	U.P.F.	UPF Barota -I	21.93
28	Ghumarwin	Ghumarwin	U.P.F.	UPF Gehra	2.26
29	Ghumarwin	Ghumarwin	U.P.F.	UPF Marhol	6.81
30	Ghumarwin	Ghumarwin	U.P.F.	UPF Mehran	4.73
31	Ghumarwin	Ghumarwin	U.P.F.	UPF Takrera-II	0.50
32	Ghumarwin	Paniyala	U.P.F.	UPF Paniala	7.72
33	Ghumarwin	Paniyala	U.P.F.	UPF Bhel	8.83
34	Ghumarwin	Paniyala	U.P.F.	UPF Churadi	2.20
35	Ghumarwin	Paniyala	U.P.F.	UPF Sindhar	11.11
36	Ghumarwin	Paniyala	U.P.F.	UPF Hawani	14.18
37	Ghumarwin	Paniyala	U.P.F.	UPF Jhukhan	12.55
38	Ghumarwin	Ghumarwin	U.P.F.	UPF Vijaypur	5.30
			Total:		**386.34**
1	Jhandutta	Samoh	U.P.F.	UPF Samoh-II	2.78

2	Jhandutta	Jhandutta	U.P.F.	UPF Balghar-IV	5.79
3	Jhandutta	Jhandutta	U.P.F.	UPF Behran-IV	2.11
4	Jhandutta	Samoh	U.P.F.	UPF Barsand	12.37
5	Jhandutta	Samoh	U.P.F.	UPF Pashol	6.75
6	Jhandutta	Samoh	U.P.F.	UPF Balla	2.34
7	Jhandutta	Samoh	U.P.F.	UPF Bijoura	21.60
8	Jhandutta	Samoh	U.P.F.	UPF Luharad	26.66
9	Jhandutta	Samoh	U.P.F.	UPF Maltla-I	3.60
10	Jhandutta	Samoh	U.P.F.	UPF Jawaha-II	1.80
11	Jhandutta	Samoh	U.P.F.	UPF Kohina-I	1.15
12	Jhandutta	Gochar	U.P.F.	UPF Jhamardian-II	5.41
13	Jhandutta	Gochar	U.P.F.	UPF Malangan-I	5.99
14	Jhandutta	Jhandutta	U.P.F.	UPF Bhatoli-II	8.83
15	Jhandutta	Jhandutta	U.P.F.	UPF Dharoti	4.53
16	Jhandutta	Jhandutta	U.P.F.	UPF Ree	10.67
17	Jhandutta	Samoh	U.P.F.	Dhararsani	2.69
18	Jhandutta	Gochar	U.P.F.	UPF Kallar	38.27
			Total:		**163.34**
1	Kalol	Bachhretu	U.P.F.	UPF Jai Shree Devi	18.18
2	Kalol	Bachhretu	U.P.F.	UPF Naghiar	22.66
3	Kalol	Bachhretu	U.P.F.	UPF Bhagatpur	4.35
4	Kalol	Bachhretu	U.P.F.	UPF Ghamarpur	17.75
5	Kalol	Bachhretu	U.P.F.	UPF Jol	168.30
6	Kalol	Bachhretu	U.P.F.	UPF Jarot	28.30
7	Kalol	Bachhretu	U.P.F.	UPF Khameri Kalan	62.90
8	Kalol	Kalol	U.P.F.	UPF Jaddu	72.05
9	Kalol	Bachhretu	U.P.F.	UPF Majher	22.54
10	Kalol	Kalol	U.P.F.	UPF Baroli Kalan-I	47.55
11	Kalol	Kalol	U.P.F.	UPF Baroli Kalan-II	36.88
12	Kalol	Kalol	U.P.F.	UPF Baroli Kalan-III	3.98

13	Kalol	Kalol	U.P.F.	UPF Baroli Kalan-IV	3.42
14	Kalol	Kalol	U.P.F.	UPF Tihri-I	32.19
15	Kalol	Kalol	U.P.F.	UPF Kadoh	25.15
16	Kalol	Kalol	U.P.F.	UPF Jhunjunu	28.20
17	Kalol	Kalol	U.P.F.	UPF Makri	27.90
18	Kalol	Kalol	U.P.F.	UPF Silh	9.46
19	Kalol	Kalol	U.P.F.	UPF Dolag	29.25
20	Kalol	Kalol	U.P.F.	UPF Paploa	16.80
21	Kalol	Kalol	U.P.F.	UPF Khairi	6.03
22	Kalol	Malhot	U.P.F.	UPF Kuthern	5.38
23	Kalol	Malhot	U.P.F.	UPF Kot	22.19
24	Kalol	Malhot	U.P.F.	UPF Salwar-I	2.11
25	Kalol	Malhot	U.P.F.	UPF Salwar-II	3.22
26	Kalol	Malhot	U.P.F.	UPF Salwar-III	6.21
27	Kalol	Malhot	U.P.F.	UPF Seri	37.60
28	Kalol	Malhot	U.P.F.	UPF Balh Chalog	36.60
29	Kalol	Malhot	U.P.F.	UPF Kharli	16.25
30	Kalol	Malhot	U.P.F.	UPF Parli	7.16
31	Kalol	Malhot	U.P.F.	UPF Dhanni	20.59
32	Kalol	Malhot	U.P.F.	UPF Sasota	19.24
33	Kalol	Malhot	U.P.F.	UPF Khukhnera	20.25
34	Kalol	Malhot	U.P.F.	UPF Chalog	21.60
35	Kalol	Kalol	U.P.F.	UPF Dohag	3.60
36	Kalol	Kalol	U.P.F.	UPF Malroun	42.50
37	Kalol	Bachhretu	U.P.F.	UPF Bargaon	57.34
38	Kalol	Bachhretu	U.P.F.	UPF Kuljiar-II	112.50
39	Kalol	Kalol	U.P.F.	UPF Gah	45.66
40	Kalol	Malhot -	U.P.F.	UPF Durghat	49.11
41	Kalol	Malhot	U.P.F.	UPF Kathiun	8.57
42	Kalol	Malhot	U.P.F.	UPF Dhanoula	8.25
			Total:		**1229.78**

1	Sadar	Sadar	U.P.F.	UPF Nihai Saharli	49.48
2	Sadar	Sadar	U.P.F.	UPF Kothipura	37.40
3	Sadar	Sadar	U.P.F.	UPF Rajpura	56.25
4	Sadar	Sadar	U.P.F.	UPF Nowa	55.48
5	Sadar	Brahampukhar	U.P.F.	UPF Mamnu	4.95
6	Sadar	Brahampukhar	U.P.F.	UPF Dabar-I	5.20
7	Sadar	Brahampukhar	U.P.F.	UPF Dabar -II	1.74
8	Sadar	Brahampukhar	U.P.F.	UPF Tepra-I	1.76
9	Sadar	Brahampukhar	U.P.F.	UPF Tepra-II	3.03
10	Sadar	Brahampukhar	U.P.F.	UPF Kuhabi Chetta	5.23
11	Sadar	Brahampukhar	U.P.F.	UPF Tyaman-II	2.93
12	Sadar	Brahampukhar	U.P.F.	UPF Luharada-I	3.77
13	Sadar	Brahampukhar	U.P.F.	UPF Luharada-III	1.40
14	Sadar	Brahampukhar	U.P.F.	UPF Bhajoon	62.42
15	Sadar	Brahampukhar	U.P.F.	UPF Boh	20.91
16	Sadar	Brahampukhar	U.P.F.	UPF Prohi	37.23
17	Sadar	Brahampukhar	U.P.F.	UPF Sagirdi	10.00
18	Sadar	Brahampukhar	U.P.F.	UPF Seola	49.00
19	Sadar	Brahampukhar	U.P.F.	UPF Shoshan-I	10.09
20	Sadar	Brahampukhar	U.P.F.	UPF Shosahan-III	4.00
21	Sadar	Sadar	U.P.F.	UPF Kuddi	6.45
22	Sadar	Sadar	U.P.F.	UPF Bharathu-I	2.60
23	Sadar	Sadar	U.P.F.	UPF Nog -II	2.18
24	Sadar	Sadar	U.P.F.	UPF Sihra	227.42
25	Sadar	Sadar	U.P.F.	UPF Kathpur	10.39
26	Sadar	Sadar	U.P.F.	UPF Kavi	68.60
27	Sadar	Sadar	U.P.F.	UPF Barota Jattan	2.49
28	Sadar	Panjgain	U.P.F.	UPF Jamthal	61.41
29	Sadar	Panjgain	U.P.F.	UPF Nehar	22.56
30	Sadar	Panjgain	U.P.F.	UPF Deola Chamb	12.37

31	Sadar	Panjgain	U.P.F.	UPF Bohat Kasol	94.50
32	Sadar	Panjgain	U.P.F.	UPF Solag Jurasi	87.50
33	Sadar	Panjgain	U.P.F.	UPF Chamyoun	6.37
34	Sadar	Panjgain	U.P.F.	UPF Sair-I	41.60
35	Sadar	Panjgain	U.P.F.	UPF Sair-II	6.35
36	Sadar	Panjgain	U.P.F.	UPF Sair -III	4.54
37	Sadar	Panjgain	U.P.F.	UPF Sair-IV	9.80
38	Sadar	Panjgain	U.P.F.	UPF Darobbar	13.50
39	Sadar	Panjgain	U.P.F.	UPF Dhar Tatoh	427.30
40	Sadar	Panjgain	U.P.F.	UPF Rani Kotla-II	10.00
41	Sadar	Panjgain	U.P.F.	UPF Surhar	4.99
42	Sadar	Panjgain	U.P.F.	UPF Sai-I	1.80
43	Sadar	Panjgain	U.P.F.	UPF Sai-II	1.40
44	Sadar	Panjgain	U.P.F.	UPF Sai-III	3.09
45	Sadar	Panjgain	U.P.F.	UPF Dhabbar-I	5.05
46	Sadar	Panjgain	U.P.F.	UPF Dhabbar-II	5.17
47	Sadar	Panjgain	U.P.F.	UPF Dhabbar-III	6.72
48	Sadar	Panjgain	U.P.F.	UPF Bholi	7.14
49	Sadar	Panjgain	U.P.F.	UPF Pahlwana-I	4.14
50	Sadar	Panjgain	U.P.F.	UPF Pahwana-II	1.52
51	Sadar	Panjgain	U.P.F.	UPF Dhadas-I	3.92
52	Sadar	Panjgain	U.P.F.	UPF Dhadas-II	2.97
53	Sadar	Sadar	U.P.F.	UPF Goind	5.21
54	Sadar	Panjgain	U.P.F.	UPF Hard Kothi	13.58
55	Sadar	Panjgain	U.P.F.	UPF Charaoo	17.41
56	Sadar	Panjgain	U.P.F.	UPF Thach	18.65
57	Sadar	Panjgain	U.P.F.	UPF Samog Brahmana	10.54
58	Sadar	Panjgain	U.P.F.	UPF Chambi	5.39
59	Sadar	Panjgain	U.P.F.	UPF Ghamrada	16.60
60	Sadar	Panjgain	U.P.F.	UPF Kyaran	1.70

61	Sadar	Panjgain	U.P.F.	UPF Bag Phuglata	13.96
62	Sadar	Panjgain	U.P.F.	UPF Panjail Khurd	1.84
63	Sadar	Panjgain	U.P.F.	UPF Janer	17.76
64	Sadar	Panjgain	U.P.F.	UPF Chandpur	14.96
65	Sadar	Panjgain	U.P.F.	UPF Panjaili	6.01
66	Sadar	Panjgain	U.P.F.	UPF Barnoo	7.57
67	Sadar	Panjgain	U.P.F.	UPF Rathoh Chilag	6.15
68	Sadar	Panjgain	U.P.F.	UPF Grour	2.50
69	Sadar	Panjgain	U.P.F.	UPF Chilag	2.17
70	Sadar	Panjgain	U.P.F.	UPF Bhughar	3.95
71	Sadar	Panjgain	U.P.F.	UPF Tikri-II	2.39
72	Sadar	Panjgain	U.P.F.	UPF Bathoh-I	2.48
73	Sadar	Panjgain	U.P.F.	UPF Bathoh-II	1.67
74	Sadar	Panjgain	U.P.F.	UPF Kanoun	11.41
75	Sadar	Panjgain	U.P.F.	UPF Gherta	8.60
76	Sadar	Panjgain	U.P.F.	UPF Gouri	9.40
77	Sadar	Panjgain	U.P.F.	**UPF Kothi Battala**	9.00
78	Sadar	Panjgain	U.P.F.	UPF Mensh	19.16
79	Sadar	Panjgain	U.P.F.	UPF Chhakoh	25.00
80	Sadar	Panjgain	U.P.F.	UPF Asha Majari	69.70
81	Sadar	Panjgain	U.P.F.	UPF Sakroa	1.33
82	Sadar	Panjgain	U.P.F.	UPF Soldha	66.59
83	Sadar	Panjgain	U.P.F.	UPF Malokhar	24.39
84	Sadar	Panjgain	U.P.F.	UPF Malothi	58.32
85	Sadar	Brahampukhar	U.P.F.	UPF Tyaman-I	1.66
86	Sadar	Sadar	U.P.F.	UPF Nog-I	2.91
87	Sadar	Sadar	U.P.F.	UPF Banola-I	2.29
88	Sadar	Panjgain	U.P.F.	UPF Dhan Kothi	39.16
			Total:		**2109.77**
1	Swarghat	Bassi	U.P.F.	UPF Jhirian	48.67
2	Swarghat	Swahan	U.P.F.	UPF Meoth-I	119.16

3	Swarghat	Swahan	U.P.F.	UPF Sinwa Sadha	13.33
4	Swarghat	Swahan	U.P.F.	UPF Maloun	2.63
5	Swarghat	Swahan	U.P.F.	UPF Bharsara	6.17
6	Swarghat	Swahan	U.P.F.	UPF Tarbar	31.36
7	Swarghat	Swahan	U.P.F.	UPF Gara	54.84
8	Swarghat	Swahan	U.P.F.	UPF Swahan	18.79
9	Swarghat	Swahan	U.P.F.	UPF Ree	144.70
10	Swarghat	Swarghat	U.P.F.	UPF Dadrana	70.24
11	Swarghat	Swarghat	U.P.F.	UPF Majher	70.34
12	Swarghat	Swarghat	U.P.F.	UPF Thapna	33.31
13	Swarghat	Swarghat	U.P.F.	UPF Jeor	15.00
14	Swarghat	Swarghat	U.P.F.	UPF Dagrahan	97.16
15	Swarghat	Swarghat	U.P.F.	UPF Talli	25.10
16	Swarghat	Swahan	U.P.F.	UPF Dolra	2.80
17	Swarghat	Swarghat	U.P.F.	UPF Gohalan	2.93
18	Swarghat	Swarghat	U.P.F.	UPF Khurgal	14.00
19	Swarghat	Rattanpur	U.P.F.	UPF Kallar	19.54
20	Swarghat	Rattanpur	U.P.F.	UPF Dhaliar	9.06
21	Swarghat	Rattanpur	U.P.F.	UPF Kot	68.78
22	Swarghat	Rattanpur	U.P.F.	UPF Mohai	39.23
23	Swarghat	Rattanpur	U.P.F.	UPF Chehri	39.86
24	Swarghat	Bhakra	U.P.F.	UPF Nehla	81.00
25	Swarghat	Bhakra	U.P.F.	UPF Dhar Pachingal	78.30
26	Swarghat	Bhakra	U.P.F.	UPF Samtehan	153.01
27	Swarghat	Bhakra	U.P.F.	UPF Chamarda	37.98
28	Swarghat	Bhakra	U.P.F.	UPF Changar Tarsuh	267.25
29	Swarghat	Bhakra	U.P.F.	UPF Tarsuh	29.63
30	Swarghat	Bhakra	U.P.F.	UPF Barota Dhowala	450.59
31	Swarghat	Bhakra	U.P.F.	UPF Dahen	486.97
32	Swarghat	Bhakra	U.P.F.	UPF Rod Jaman	312.16
33	Swarghat	Bhakra	U.P.F.	UPF Jandour	292.73

34	Swarghat	Bassi	U.P.F.	UPF Kudini	106.39
35	Swarghat	Bassi	U.P.F.	UPF Dabat Majari	314.11
36	Swarghat	Bassi	U.P.F.	UPF Dolan	107.30
37	Swarghat	Bassi	U.P.F.	UPF Behrera	192.43
38	Swarghat	Bassi	U.P.F.	UPF Lakhnu	6.53
39	Swarghat	Swahan	U.P.F.	UPF Pangwana	38.53
40	Swarghat	Swahan	U.P.F.	UPF Khairian	97.59
41	Swarghat	Swahan	U.P.F.	UPF Behal	268.98
42	Swarghat	Swahan	U.P.F.	UPF Lakhala	102.77
43	Swarghat	Swahan	U.P.F.	UPF Maura	56.20
44	Swarghat	Swahan	U.P.F.	UPF Khatera	32.00
45	Swarghat	Swahan	U.P.F.	UPF Mehla	48.13
46	Swarghat	Swahan	U.P.F.	UPF Tirli	16.24
47	Swarghat	Swarghat	U.P.F.	UPF Dadwal	4.65
48	Swarghat	Swarghat	U.P.F.	UPF Khurani	250.93
49	Swarghat	Rattanpur	U.P.F.	UPF Patta	31.93
50	Swarghat	Rattanpur	U.P.F.	UPF Tunu	100.70
51	Swarghat	Rattanpur	U.P.F.	UPF Ball Pothar	83.62
52	Swarghat	Rattanpur	U.P.F.	UPF Chharol	98.68
53	Swarghat	Rattanpur	U.P.F.	UPF Ball Kanetan	71.09
54	Swarghat	Rattanpur	U.P.F.	UPF Jamli	198.73
55	Swarghat	Rattanpur	U.P.F.	UPF Neri	49.13
56	Swarghat	Bassi	U.P.F.	Ghatewal	513.07
			Total:		**5926.35**
		Grand Total:			**17061.01**

4.8 Enumerations: - Enumerations of all valuable tree species down to 10 cm diameter have been carried out and summarized in appendix-i (IV).

4.9 Silvicultural System: - No silvicultural system is required as the introduction of the indigenous and most economically valuable and ecologically suitable tree species by planting is the main plank of management in this Circle.

4.10 Rotation and Treatment Period: - Rotation at this stage is of no practical importance. There is a tremendous pressure of grazing in all these forests. Disproportionate closures and disregarding the grazing demand of local population will defeat the efforts to convert these blank and poor quality forests into better quality and stocked forests. Keeping in view the closure period of 10 years and extent of closure at a time, the treatment period is kept as 30 years.

4.11 Planting programme: - The sequence of annual planting and maintenance has been suggested in table 4.3. As the planting programme depends mainly on the budget allocation, so it is left at the discretion of the D.F.O. to increase or decrease the targets accordingly. However, while finalising the annual planting programmes as far as possible, the sequence of planting programme suggested below should be adhered to. For each year a planting programme for about 200 ha has been proposed. This would ensure that during the Working Plan period about 3000 ha of degraded forests will be planted up while framing the planting sequence efforts have been made that not more than 1/3rd of the forest should remain closed except for very small areas. The adjoining forests of such small forests will be kept open so that people may exercise their rights in those forests.

TABLE- 4.3

ANNUAL PLANTING PROGRAMME

Year	Range	Block	Name of Forests	Total Area in hac	Area to be planted	Remarks
1	2	3	4	5	6	7
2012-13	Swarghat	Fatehpur	C 11 Jajjar	101.60	20.00	
	Sadar	Brahampukhar	C 1 Bahadurpur	58.80	20.00	
	Bharari	Mohra	C1a Plasla	118	20.00	

	Jhandutta	Samoh	Tikkri I	25.55	20.00	
	Ghumarwin	Paniala	C3a Paniala	71.2	20.00	
	Kalol	Bachhretu	CI Wansa	95.2	20.00	
					120.00	
2013-14	Bharari	Mohra	C1a Plasla	118	20.00	
	Ghumarwin	Harlog	C11Malyawar	85.6	20.00	
	Jhandutta	Gochar	DPF Malngan II	22	20.00	
	Kalol	Kalol	DPF Paploha	46.55	20.00	
	Sadar	Sadar	Baggi	20.27	20.00	
	Swarghat	Rattanpur	CI Jamli	59.58	20.00	
					120.00	
2014-15	Bharari	Mohra	CIB Plasla	102.8	20.00	
	Ghumarwin	Harlog	C2 Umari	46	20.00	
	Jhandutta	Samoh	C8a Didwin	42.4	20.00	
	Kalol	Bachhretu	C5 Boungar	26.49	20.00	
	Sadar	Sadar	Cia Sungal	24.77	20.00	
	Swarghat	Swahan	C10Dadnal	25.6	20.00	
					120.00	
2015-16	Bharari	Mohra	Sunali	26.43	20.00	
	Ghumarwin	Ghumarwin	Bari majherwan	22	20.00	
	Jhandutta	Samoh	UPF Bajora	21.6	20.00	
	Kalol	Bachhretu	UPF Bargaon	57.34	20.00	
	Sadar	Sadar	Upf Nihai Saharli	49.48	20.00	
	Swarghat	Rattanpur	UPFTunu	100.7	20.00	
					120.00	
2016-17	Bharari	Mohra	Cia Plasla	118	20.00	
	Ghumarwin	Harlog	C3 Dhangoo	144.8	20.00	
	Jhandutta	Samoh	C7 Bagra	72	20.00	
	Kalol	Kalol	C22 Bharoli Kalan	36	20.00	
	Sadar	Sadar	c5b Buryans	90	20.00	
	Swarghat	Swahan	C12 Dindroo	66.8	20.00	
					120.00	
2017-18	Bharari	Mohra	UPF Himar	21.93	20.00	
	Ghumarwin	Harlog	UPF Jabliana	33.17	20.00	
	Jhandutta	Gochar	UPF Kallar	38.27	20.00	
	Kalol	Bachhretu	UPF Naghiar	22.66	20.00	
	Sadar	Brahampukhar	UPF Bhajoon	62.42	20.00	

	Swarghat	Bhakra	UPF Barota Dhowala	450.59	20.00	
					120.00	
2018-19	Bharari	Mohra	UPF Kotlu Brahmna	29.7	20.00	
	Ghumarwin	Harlog	UPF Muthani	40.61	20.00	
	Jhandutta	Samoh	UPF Luharad	26.66	20.00	
	Kalol	Bachhretu	UPF Baroli Kalan II	26.88	20.00	
	Sadar	Brahampukhar	UPF Seola	49	20.00	
	Swarghat	Bassi	UPF Kudini	106.39	20.00	
					120.00	
2019-20	Bharari	Nihari	C2 f HariTalyangar Ist	7.43	5	
		Mohra	DPF Paniala I	7.61	5	
		Mohra	DPF Paniala II	7.93	5	
		Mohra	Chhat II	7.23	5	
	Ghumarwin	Ghumarwin	C18 Sadyar	121.2	20.00	
	Jhandutta	Samoh	C3 Sidh Nalian	76.8	20.00	
	Kalol	Bachhretu	C8 Anti	114.8	20.00	
	Sadar	Sadar	c2 Dali	80.1	20.00	
	Swarghat	Swarghat	C11 Jajjar	101.6	20.00	
					120	
2020-21	Bharari	Mohra	CI b Plasla	102.8	20.00	
	Ghumarwin	Ghumarwin	C7a Pheti Dhar	105.6	20.00	
	Jhandutta	Jhandutta	Parahu I	33.47	20.00	
	Kalol	Malhot	DPF Dhani	53.2	20.00	
	Sadar	Sadar	DPF Parnali I	114.61	20.00	
	Swarghat	Swahan	UPF Mehla	48.43	20.00	
					120.00	
2021-22	Bharari	Mohra	UPF Mohra	13	10.00	
		Mohra	Parahu I	12	10.00	
	Ghumarwin	Harlog	DPF GhanC4	166.25	20.00	
	Jhandutta	Samoh	DPF C5b Kangral	50	20.00	
	Kalol	Malhot	DPF Suh I	26.85	20.00	
	Sadar	Sadar	C3 Jhaleda	93.2	20.00	
	Swarghat	Bhakra	UPF Bahen	486.97	20.00	
					120.00	
2022-23	Bharari	Mohra	DPF Panila III	17	10.00	

		Mohra	UPF Khungan	11.36	10.00	
	Ghumarwin	Harlog	C7 Rohan	153.2	20.00	
	Jhandutta	Jhandutta	DPF Dolasawan II	28.76	20.00	
	Kalol	Malhot	DPF Kharli	66.4	20.00	
	Sadar	Panjgain	C2a Chamyoun	100.2	20	
	Swarghat	Bhakra	UPF ChangerTarsuh	267.25	20.00	
					120.00	
2023-24	Bharari	Mohra	Cia Plasla	118	20.00	
	Ghumarwin	Harlog	C10Bal Churani	80.4	20.00	
	Jhandutta	Samoh	C4 Jhoru	102	20.00	
	Kalol	Malhot	C3 Bagphal	198	20.00	
	Sadar	Sadar	DPF Bandla 2	98.6	20.00	
	Swarghat	Bhakra	UPF Samtehan	153.01	20.00	
					120.00	
2024-25	Bharai	Mohra	UPF Kuthalag	11	5.00	
	Ghumarwin	Paniala	C5b Kulleri	78	35.00	
	Jhandutta	Jhandutta	DPF Balgarh IV	60.66	20.00	
	Kalol	Malhot	Kot Ist	30.06	20.00	
	Sadar	Sadar	DPF Sungal	34.05	20.00	
	Swarghat	Bassi	UPF Ghatewal	513.07	20.00	
					120.00	
2025-26	Ghumarwin	Harlog	C8 Nain	71.6	20.00	
		Harlog	C8 PhetiDhar	93	20.00	
	Jhandutta	Samoh	C8g Dafer	15.8	10.00	
		Samoh	C8h Dahad	17.34	10.00	
	Kalol	Kalol	DPF Tihri I	32.19	20.00	
	Sadar	Sadar	C4Buryans	154	20.00	
	Swarghat	RattanPur	UPF Neri	49.13	20.00	
					120.00	
2026-27	Ghumarwin	Harlog	C3 Dhangoo	144.8	20.00	
	Sadar	Panjgain	UPF Asha Majari	69.7	20.00	
	Jhandutta	Samoh	DPF Rachhera	31.34	20.00	
	Kalol	Malhot	DPF Kharli III	47.97	20.00	
	Sadar	Sadar	Bandla I	65.93	20.00	
	Swarghat	Bhakra	UPF Jandour	292.73	20.00	
					120.00	
2027-28	Ghumarwin	Ghumarwin	UPF Bhager	29.81	10.00	

		Ghumarwin	UPF Barota Ist	21.93	10.00	
	Jhandutta	Gocher	C ia Kallar	22	10.00	
		Gocher	C3a Gandir	28	10.00	
	Kalol	Bachhretu	UPF Kuljiar II	112.5	20.00	
	Sadar	Sadar	UPF Rajpura	56.25	20.00	
	Swarghat	Bassi	UPF Dabat Majari	314.11	20.00	
		Bassi	UPF Dolan	107	20.00	
					120.00	

4.12 Choice of species: -

The main species would be Chil, Khair, Shisham and Bamboos. Chil plantation does not succeed in scrubby areas below 800 meters in height. More over the competition for moisture during the dry months is rather very heavy, therefore areas below 800 meters are considered more suitable for Khair and Shisham. Bamboo should be planted preferably in depressions and in areas having better water regime and soil depth.

4.13 Planting Technique: -

The planting technique of Khair and Chil by raising seedlings in polythene tubes is well established as a standard practice in the Department. The salient features of the technique are described as under:-

4.13.1 Selection of site and preparation of Treatment Map:-

This is important in case the total area of the forest/compartment is not prescribed for planting. The site must be personally inspected by the DFO one year in advance of planting with a view to ascertain its suitability for planting, difficulty of closure, possibility of further extension and facility of supervision etc. The area should be demarcated on the ground and also mapped on 1:15000 scale indicating the species to be planted in the area along with any other treatment required for stocking the area. The treatment map should be placed in the compartment history file of the area.

4.13.2 Closure: - A closure notification for a period of 10 years of the plantation area should be got issued one year in advance of planting and the area then fenced. The area is protected effectively against grazing lopping and fire.

4.13.3 Seed Collection: - Seed collection will be done departmentally from the seed stands otherwise certified seed will be procured from the seed certification unit of Silviculture Division. There is only one seed stand of Chil in Fatehpur C1. Swarghat Forest having 193 trees in Swarghat Range. Collected seed will then be cleaned and stored in air tight containers to maintain its viability after mixing insecticides or ash etc.

4.13.4 Raising of Nurseries:-Existence of well planned and well managed nursery is a prerequisite for the success of any plantation programme. Thus, efforts should be made to raise at least one main permanent nursery in each Range. Such a nursery should be centrally located as far as possible, if the plantation area is quite far away from this main nursery then temporary nursery either in the proposed plantation area, or in its near proximity should be established. Sufficient plants required for planting up the area should be raised well in advance keeping in view the period required by the plants to attain the plantable size. Important characteristics of some of the main species that should help in raising the nurseries are given below:-

S. No.	Species	Month in which Seed Ripens	No. of seed per Kg	Method of Raising Plantation	Plant Age at Planting Time
	1.	2.	3.	4.	5.
1.	Chil	Feb. - April	8800 to 12300	Polythene bags	5½ months
2.	Khair	Jan. - March	40000	Polythene bags	5½ months
3.	Bamboo	April - June	32000	Rhizome/ETP	12 months
4.	Kachnar	May - June	2000 to 3520	Entire Plant	3 months
5.	Semal	March - May	21430 to 38500	Root/shoot cutting	12 months
6.	Siris	Jan. - March	8000 to 13000	Root/shoot cutting or ETP	3 months
7.	Shisham	Nov. - March	53000	Sowing, root/shoot	3 months

8.	Bahera	Nov. – Feb.	423	Entire	12 months
9.	Tun	April - June	55000	Entire	12 months
10.	Jaman	June - July	1200	Entire	12 months

4.13.5 Nursery Technique: - This includes:

i) **Pretreatment of Seed:** - The nature of Pretreatment of seed depends on hardness of the testa. Seeds which have soft seed coats generally do not need pretreatment. However it is always advisable to put the seed in water for 24 hours and dry them in shade before sowing. Seeds with hard coats can be subjected to a number of treatments which can be classified as:-

a) Physical method: - This includes soaking and baking e.g. Harer (*Terminalia belerica*), storing of seed in moistened medium e.g. Walnut (*Juglans regia*); boiling in water for a minute e.g. *Robinia pseudoacacia*.

b) Chemical method: - This includes emersion of seed in Sulphuric acid (spp. Gravity 1.84) for about six hours or more e.g. *Acrocarpus fraxinifolius*.

c) Bio Chemical method: - In this method seed is allowed to pass through animal stomach e.g. Kikar (*Acacia nilotica*).

ii) Sowing of Seed: - The required quantity of pretreated seed is sown in the nursery beds, boxes or polythene bags as the case may be. Small seeds are sown either through Broadcasting or in lines after mixing with equal quantity of sand. The large seeds are sown in lines touching each other. The depths of the seed are kept equal or double the seed thickness depending on the period of germination. The depth of the seed germinating early is kept low. The distance between the lines is kept 2-3 cm. in polythene bags 2 to 3 seeds are sown per bag. After sowing the seed the soil is covered with paddy straw or other similar material and watered with a rose can.

iii) Watering: - Regular sprinkle watering is required till the germination is complete. Excessive and under watering should be avoided. In summer season two watering one in the early morning and another in the late evening should be given. In winter watering once a day or on alternate day can suffice.

iv) Weedings: - Weeding entails removal of unwanted plants. The intensity of weeding depends upon the growth of weeds in the nursery. Normally it should be done fortnightly. Hoeing should also be done along with seeding but it should be ensured that seedling roots are not unduly disturbed.

v) Transplanting: - The pricking out of seedlings is carried out when the cotyledons have dropped off or two primary leaves have emerged. The seedling stems attain reasonable strength to stand transplanting. This period varies from species to species but generally it is 3 to 4 weeks. This operation is done preferably on a rainy day or in the evening and adequately watered. The transplanting bed is provided with shade for about a week. The distance between the transplants varies. Generally it is kept 5 to 7 cm along the lines and also access if the seedlings are to be maintained for 6 to 8 months. The distances are increased if the retention of seedlings exceeds 8 months.

4.13.6 Construction of Inspection Path: - In the plantation an Inspection path of 0.6 meter in width is to be laid in such a way that it covers the whole area and has a gentle gradient. This will facilitate the execution of works, supervision and inspection.

4.13.7 Bush Cutting: - In case the area is infested with a heavy growth of bushes, these will be cut in strips along the contour and disposed off before carrying out the earth work. Lantana should be uprooted and burnt in the plantation area itself.

4.13.8 Earth Work: - Earth work should be completed before the planting starts so that earth has weathered well before it is filled back in the pits or trenches. For areas having elevation up to 1000m, contour trenches of 1m x 45cm x 45cm at a spacing of 3 meters with a pits of 30 cm x 30 cm x 30 cm size in case of Chil & Khair or 45 cm x 45 cm x 45 cm in case of Bamboos and other miscellaneous broad leaved species in the middle of the two trenches are recommended. In areas above 1000 meters pits along with contour terraces of 100cm x 30cm x 5 cm should be dug with pit sizes remaining the same as above. This work must be completed by 15th March each year so that planting can commence immediately after onset of monsoons and completed at a quicker pace during the months of July and August itself. Timely planting always results in earlier better.

4.13.9. Time of Planting: - Monsoons is the most suitable time of planting in this Division as winter rains are undependable erratic and of short duration. The planting should be started after receiving a few good showers of summer rains.

4.13.10. Carriage of Plants from the Nursery: - The maximum damage to the plants is done during transportation of the plants from nursery to the plantation area. This damage can be avoided by careful packing of the plants into boxes. Before the plants are lifted from the nursery these should be graded according to their height and general health. To minimize damage to roots during transportation of plants to planting sites, seedlings should be thoroughly treated with urea solution made by mixing 100 gms of urea in 20 liters of water before packing in boxes.

4.13.11. Planting: - After few good showers of rains the planting is started. If the seedlings have been raised in Polythene bags, the Polythene bags are cut with a blade with the cut running from top downwards towards the bottom in such a way that ball of earth is separated from the bag. The ball of earth containing the seedling is then kept in the pit in such a manner that collar of the plant is flush with the ground level. The pit is then filled with dug out clean soil and pressed all around till it becomes compact and air tight. Light watering is then given. The cut polythene bag is then spread round the plant to act as mulch. Entire plants and root shoot cuttings are also planted in the same manner but with care so that no damage occurs to the side roots of the plants. A fresh slanting cut is given to the roots and shoots before planting if it is noticed that their tips have been dried up.

4.13.12. Cultural Operations: - Two weedings and hoeings in 1st year and one weeding in 2nd year are necessary. Regular bush cutting is required till the plants are safe from suppression. The area is to be protected from Grazing and fire. Regular climber cuttings are also required. Regular repair of inspection paths and fence should be carried out. Cleanings and thinning will be required in due course of time.

4.14. Treatment of Existing Plantations: - The existing plantations will be tended and cleaned. Beating up of failures is required to be taken up on a large scale for filling up the gaps. Closure notifications of these plantations are required to be got issued on top priority to ensure effective protection of the area from grazing and lopping.

4.15 Record of Plantations: - All details of operations like beating up of failures, weedings, cleanings etc will be recorded in the concerned compartment history files on

the attached standard forms. A record of inspection notes of the visiting officers should also be kept in Good print in these files. The record of growth of labeled plants should also be kept in compartment history files.

4.16 Growth Record: - Fifty plants of each species in each plantation should be selected at random and measured to keep a record of diameter and height growth of them. This record will be maintained in the following pro forma:-

Year	Height (mts)			Diameter (d.b.h) cms		
	Max	Min	Average	Max	Min	Average

4.16.1 These measurements will be taken only once in the month of December every five years. The record will be maintained throughout the life of the plantation and kept in the compartment history files.

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CHAPTER –V

THE KHAIR (OVER LAPPING) WORKING CIRCLE

5.1 General Constitution: - This Working Circle over laps all other working circle described in the previous chapters except the Rehabilitation Working Circle.

5.2 General Characters of Vegetation: - This has been described separately in individual chapters and also in Chapter-II, Part-I of this Plan.

5.3 Special Objects of Management:- These are :-

- ✓ To harvest all mature and over mature stock of Khair.
- ✓ To increase the proportion of Khair both by artificial and natural regeneration in suitable areas.
- ✓ To provide Khair wood as raw material to the local *katha* manufacturing units and employment directly or indirectly to the people.
- ✓

5.4 Analysis and Evaluation of the Crop: - Khair mostly occurs singly and scattered in the miscellaneous broad leaved and scrub forests. It also occur in pure patches as a result of past plantations..All these areas have been stock mapped separately on 1:15000 scale.

5.4.1 Enumerations: - The enumerations of Khair trees in 5 cm diameter classes have been carried out down to 10 cm d.b.h. and its details are given in appendix-I(vi). The abstract of these enumerations for each Working Circle is given in Table 6.1.

TABLE 6.1									
DISTRIBUTION OF KHAIR TREES IN DIAMETER CLASSES IN ALL WORKING CIRCLES									
Working Circle	V	IV	III	II A	II B	I A	I B	Total	Volume (m3)
Chil Working Circle	26161	9120	1374	308	0	1	1	36965	3097.584
Protection Working Circle	7115	3663	471	29	1	1	0	11280	1014.903
Plantation Working Circle	60839	18417	2670	330	31	2	0	82289	6473.039
Grand Total:	**94115**	**31200**	**4515**	**667**	**32**	**4**	**1**	**130534**	**10585.526**

TABLE 6.1.1

DISTRIBUTION OF KHAIR TREES IN 5 cms. DIAMETER CLASSES IN ALL WORKING CIRCLES															
	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	Total
	11234	14927	4001	5119	662	712	107	201	0	0	1	0	1	0	36965
	3540	3575	1839	1824	240	231	12	17	1	0	1	0	0	0	11280
	29411	31428	9252	9165	1302	1368	158	172	16	15	1	1	0	0	82289
	44185	49930	15092	16108	2204	2311	277	390	17	15	3	1	1	0	130534

5.5 Silvicultural System:- The khair trees will be worked on selection system

5.6 Exploitable Diameter:- It is fixed at 25 cm d.b.h. as the trees above this size tend to deteriorate.

5.7. Felling Cycle:- The felling cycle is kept 10 years. All areas allotted will be gone over once during the plan.

5.8 Calculation of yield:- The yield is prescribed and regulated by the number of trees of and above exploitable size. The yield is calculated by the smithies formula as under:-

$$X = \frac{f}{t} \text{ (II-Z\% of II) \&}$$

$$Y = \frac{X}{1+\frac{X}{2}} \times 100+A$$

Where f = Felling Cycle i.e. 10 years.

t = time taken by the trees of sub exploitable diameter class i.e. 20 to 25 cm class to go to 25 to 30 cm class= 10 years

II = Existing number of trees in the sub exploitable diameter class= 12459.

I = existing number of trees of and above the size of exploitable diameter= 19795 excluding protection working circle.

Z = Percentage of II class trees that disappear in t years due to various reasons= 30%

A = An arbitrary constant.

From the growth figure of khair as mentioned in chapter-IV Part-I, it is evident that approach class (20-25 cm dia) trees pass on to the exploitable class (25 cm dbh & over) in about 15 years. It is also presumed that 30% trees disappear during this 15 years period when they pass on to the exploitable class.

The yield is therefore estimated as under:-

$$X = \frac{f}{t} (II - Z\% \text{ of } II)$$

$$= 15/15\ (12459-3737)$$

$$= 8722$$

The annual yield works out as under:-

$$Y = \frac{X}{\frac{1+X/2}{100}+A} = \frac{8722}{19795+4361} \times 100 \pm 6.76$$

$$= 8722/24156 \times 100 \pm 6.76$$

$$= 42.86$$

$$\sim 45$$

Giving a value of (-) 6.76 to A the annual yield becomes 45% of the exploitable trees present in the area. In all 8907 trees of 20 cm dbh and above will be available for felling in next 15 years. The yield prescribed is 593 trees or say 600 trees per annum with a deviation of 15% which should be squared up to during the following 5 years so that at the end of a block of 5 years the total deviation should not increase 10%.

5.8.1. **Regulation of yield:-** The yield will be regulated by area for which equiproductive coups have been prepared and proposed in the sequence of felling.

5.9 **Methods of executing felling:-**Marking officers will be guided by the following principles:

1. The marking will correspond to conservative selection principles. No marking on steep slopes, 30 meters on either sides of roads and perennial nallas and in portions susceptible to soil erosion will be carried out.
2. 80% of trees above 25 cm dbh will be marked for fellings and the remaining will be retained for seed and protection.
3. All dead, diseased and fallen trees will be marked.
4. Isolated trees will not be marked.
5. the stumps left should not be more than 15 cm above the ground to ensure the production of coppice shoots. The marking numbers should be written as low as possible.
6. Felling must be completed by the end of March every year.

5.10 **Sequence of felling:-** The following sequence for executing felling for khair trees proposed.

TABLE 6.2

Year	Range	Block	Forest	Area	Remarks
2012-13	Ghumarwin	Ghumarwin	UF Bari Majherwan	22	
	Kalol	Bachrretu	UF Kothi	44.07	
	Kalol	-do-	UF Piungli	29.25	
				95.32	
2013-14	Kalol	Bachrretu	C27 Gangloh	12	
			C28 Sanihara	54.40	
		Malhot -	C45 Dhani	75.60	
				142	
2014-15	Swarghat	Swahan	UF Gara	54.84	
	Ghumarwin	Paniyala	C3a Paniyala	71.20	

		Paniyala	C5b Kulehri	78	
	Jhandutta	Jhandutta	C6c Jhoula	73.75	
			C7a Jhoula	10.40	
			UF Balghar	54.89	
	Kalol	Bachrettu	UF Gharwasra	8.41	
				351.49	
2015-16	Ghumarwin	Jhanjiar	UF bard	3.12	
	Jhandutta	Gochar	C5a Kathiun	41.60	
			UF Jhabola	55.15	
	Kalol	Bachrettu	UF Jole	168.30	
			UF Chalawa	11.16	
			UF Malhot	62	
				341.33	
2016-17	Kalol	Bachrettu	C4 Gharwasra	17.20	
			C9 Chountas	58.04	
			UF Kulziar	44.88	
			UF Koserian	30.57	
				145.69	
2017-18	Ghumarwin	Paniyala	UF Bhel	8.83	
	Jhandutta	Samoh	UF Salasi	2.68	
			UF –do-II	1.65	
			UF Rachrea	4.16	
		Gochar	C1c Kallar	50.40	
			UF changer Talai	30.03	
	Kalol	Bachrettu	C41 Buhar	39.20	
				136.95	

2018-19 & 2019-20	Jhandutta	Gochar	C6a Gujrera	24	
			C5b Kathiun	36.6	
				60.60	
2020-21 & 2021-22	Kalol	Bachrettu	C2 Ghatra	80.4	
			UF Jai Devi	18.18	
		Bachrettu	C44 Harawali	110.80	
				209.38	
2023-24	Jhandutta	Samoh	C3 Nalla ka Sidh	76.80	
			UF Tikri	25.55	
		Gochar	UF Kallar	44.40	
				146.75	
2024-25 & 2025-26	Ghumarwin	Ghumarwin	C18 Sadiar	121.20	
	Jhandutta	Goacher	UF Malangan	22.36	
				143.56	
2027-28	Kalol	Bachrettu	UF Piungli	55	
			UF Koserian	30.57	
		Bachrettu	UF Fufli Jhalwana	11.23	
				96.80	

5.11 **Subsidiary Silivicultural Operation's:-** These have been prescribed separately for each working circle over which the khair working circle overlaps.

CHAPTER –VI

THE BAMBOO (OVER LAPPING) WORKING CIRCLE

6.1 General Constitution: - This working circle overlaps all the working circles described in the previous chapter having bamboo bearing forests with bamboo clumps either in compact patches or occurring scattered and single in the whole area.

6.2 General characters of Vegetation: - This has been described separately in the individual working circles and also in Chapter-II, Part-I of this Plan. The condition of the bamboo clumps on the whole is bad except in case of Rattanpur C1. Kasal and Bachhretu C4. Garwasra. The culms in most of the clumps are congested, broken and malformed. Regeneration of bamboo is very scanty and absent in most areas due to heavy grazing.

6.3 Special objects of Management:- The special objects of management are:-

- ✓ To improve the bamboo clumps by judicious cleanings and thinnings for increasing the productivity
- ✓ To obtain maximum progressive sustained yield of bamboos from these areas.
- ✓ To regenerate bamboo areas by artificial means.
- ✓ To provide for the bonafide requirements of the local people.
- ✓ To encourage bamboos as under storey and ground cover in plantation, scrub and Rehabilitation Working Circles.

6.4 Area and Allotment: - The Range wise and Block wise break up of forests allotted to this Working Circle is given in Table 6.1

TABLE 6.1

AREA STATEMENT OF BAMBOO BEARING COMPARTMENTS/FORESTS

	Chil Working Circle			
Sr. No.	Range	Forest/Compt.	Area in ha.	Bamboo clumps
1	Ghumarwin	C-6 (b) Dugli	26	47

2	Ghumarwin	DPF C-2Tiun Khas	54	5
3	Kalol	C-1 Dhanaula	14.8	3
4	Kalol	C-20 Ladeh	8.8	55
5	Sadar	Upf Challeli	37.9	70
6	Sadar	DPF Jamthal C-I(a)	61.8	12
7	Swarghat	C-10 Dadnal	25	690
		Total:	228.3	882
	Plantation Working Circle			
1	Kalol	C-5 Baungar	26.49	316
2	Sadar	UPF Rajpura	56.25	1060
3	Sadar	UPF Seola	39	7
4	Sadar	DPF Chamyaun C-2 (a)	100.2	529
5	Kalol	UPF Makri	27.9	2227
		Total:	**249.84**	**4139**
	Rehb. Working Circle			
1	Kalol	C-32 Johar Khas	48	321
2	Bharari	DPF Hatwar	1.68	8
3	Sadar	DPF Brayance C-S (a)	88.4	130
		Total:	**138.08**	**459**
	Scrub Working Circle			
1	Bharari	DPF Thandora	3.92	9
2	Kalol	UPF Gharan	45.1	820
3	Swarghat	UPF Jabbal	23.37	274
			72.39	**1103**
		Grand Total:	**688.61**	**6583**

6.5 Analysis and Evaluation of Crop: - Bamboo mostly occurs either in pure patches or mixed with miscellaneous broad leaved and scrub species as an under storey. All bamboo bearing areas have been stocked mapped on 1:15000 scale and maps placed in the compartment history files.

6.6 Enumerations: - Enumeration of clumps has been carried out along with enumeration of valuable species. On the basis of these enumerations the average number of clumps come out to be 17 per ha.

6.7 Silvicultural System: - Bamboo crump will form the unit of management. The bamboos will be harvested on a selection system coupled with cleanings and thinning.

6.8 Rotation And Felling Cycle: - A bamboo Culm attains its entire height and diameter during the first growing season. But it is not fully mature till it is two years old. The culms start deteriorating after 5th year. Therefore, it is the felling cycle and not the rotation which is important in case of bamboos. Keeping in view the conditions of the clumps and the objects of management, a felling cycle of 3 years has been adopted.

6.9 Regulation of Yield: - The yield will be regulated by area. For harvesting purposes more or less equiproductive coupes have been laid and prescribed. Determination of exact yield in case of bamboos is not possible because the appearance and growth of new culms depend on a number of factors, some of which cannot be regulated or controlled. However on rough estimates the bamboo yield on an average has been estimated to be about 10 bamboos per clump or 170 bamboos per ha. The salvage removal of Bamboo Working Circle will be counted towards the main yield. Petty felling to be approved by the competent authority and the removal will be counted towards the main yield.

6.10 Sequence of Fellings: - The felling programme will be as under:-

TABLE - 6.2

FELLING PROGRAMME OF BAMBOOS

Year	Range	Name of Forest	Area in ha.	Area under Bamboos in ha.	Method of treatment
	Swarghat	C-10 Dadnal	25.60	9.49	Improvement fellings
	Swarghat	UPF Khurgal	14.00	1.50	do
		C1 Jamli	59.58	1.58	do
		UPF Jamli	198.73	20.00	do
		UPF Neri	49.13	2.25	do
		Total Swarghat Range	**347.04**	**34.82**	
	Jhandutta	C4 Jhoru	102.00	40.73	Commercial fellings
		C5b Kungral	50.00	12.19	Commercial fellings
		Total Jhandutta Range	**152.00**	**52.92**	
	Kalol	C1 Wansa	95.20	22.65	Commercial fellings
		C-7 Piungli	55.00	1.20	Improvement fellings
		UPF Kothi	44.07	2.00	do
2012-		UPF Bargaon	57.34	5.00	do
13,		UPF Jarot	28.30	1.22	do
2015-		C-7 Malhot Godam	4.80	2.00	do
16,		C-8 Kot Godam	9.60	4.60	do
2018-		C-25 Gharan	5.20	1.70	do
19,		C-26 Manjher	4.80	0.80	do
2021-		C-40 Jhoar Sundri	133.65	3.76	do
22,		C-42 Paploa	87.80	10.20	do
2024-25		C-43 Gadiana	74.80	4.14	do
		Total Kalol Range	**600.56**	**59.27**	
2013-	Sadar	C-4 Kasal	39.20	26.20	Commercial fellings

14, 2016-17, 2019-20, 2022-23, 2025-26		C-1a Jamthal	61.80	0.40	Improvement fellings
		Total Sadar Range	**101.00**	**26.60**	
	Kalol	C-4 Gharwasra	17.20	12.43	Improvement fellings
		C-9 Chaunta	53.04	3.71	do
		C-22 Bharoli Kalan	36.00	10.29	do
		C-38 Chaknar	32.80	7.40	do
		UPF Bharoli Kalan-I	47.55	47.55	do
		UPF Bharoli Kalan-II	36.88	36.88	do
		Total Kalol Range	**223.47**	**118.26**	
2014-15, 2017-18, 2020-21, 2023-24, 2026-27	Bharari	C-1a Plasla	118.00	14.81	do
		Total Bharari Range	**118.00**	**14.81**	
	Ghumarwin	C-5 b Kulehari	78.00	2.13	Improvement fellings
		C-7a Phetidhar	105.60	29.60	Commercial fellings
		C-8 Phetidhar	93.60	60.00	do
		UPF Amarpur	62.73	10.00	Improvement fellings
		Total Ghumarwin Range	**339.93**	**101.73**	
	Kalol	C-2 Ghatera	80.40	4.46	Improvement fellings
		UPF Gharwasra	8.41	0.70	do
		C-27 Gangloh	12.00	6.00	do
		C-39 Kojar Sura Pani	112.63	2.51	do
		C-41 Bohar	39.20	2.00	do
		Total Kalol Range	**252.64**	**15.67**	
		Grand Total:	2134.64	424.08	

6.10.1 If the forests prescribed for improvement fellings, are found suitable for commercial exploitation in any subsequent felling cycle then such forests after field inspections 12271 will be worked for commercial fellings and should be included in the commercial felling programme of that year.

6.11 Method of Executing Fellings: - The bamboo clumps have deteriorated due to maltreatment by the right holders and others and also due to the neglect by the Department in the past. For the improvement of bamboo crop full enforcement of felling

rules as enunciated below, correct maintenance of the record as removals and strict supervision have to be ensured. The following felling rules shall be strictly adhered to:-

- ✓ Work of extraction shall be allowed between November and March only.
- ✓ No area or clumps shall be left unworked, except for those on the periphery, where the growth may be poor. The tendency of not working the congested clumps should be curbed as congestion in the clumps retards the production of new culms and render them inferior in quality.
- ✓ Each clump will be treated as a unit of working. In each clump, old culms equal in number of new culms but not less than 6 shall be retained. The old culms retained should not be more than 4 years old. This is necessary for the adequate foliage for food supply to the rhizomes and sufficient support for the new culms. This is also necessary for better production and quality of bamboos.
- ✓ If no new culm is found in a clump, half of the old culms in the clump shall be retained.
- ✓ The old culms retained in a clump should be well grown of full length and as evenly distributed over the clump as possible, preferably along the periphery of the clump. The leading exterior culms shall not be cut even if they are malformed, as their retention is in the interest of outward growth of rhizomes. The culms in the clump shall be cut in a horse shoe pattern with opening in the downhill side.
- ✓ All dead, dying, insect attacked and half cut culms shall be removed.
- ✓ Culms less than 3 years old are somewhat immature and less than 2 years are unacceptable in the market. Therefore these are not to be cut.
- ✓ Culms should be cut just above the 1st node and not higher than 15 cms above the ground level. In badly congested clumps the cuttings should be done at the lowest possible point.
- ✓ Cutting of *manus* for binding bamboo bundles is prohibited. Similarly hacking and lopping of the culms for fodder by the right holders is strictly prohibited.
- ✓ Only sharp instruments shall be used for cutting the culms so that their stumps are not torn or split. The culm should be cut in one stroke and in slanting position.
- ✓ Digging out or extraction of rhizomes is strictly prohibited.

- ✓ No culm shall be cut in its year of flowering. It will be cut after the seed has been shed.
- ✓ Climbers damaging the culms and interfering with the growth shall be cut.
- ✓ xv) Removal should be cautious on hot aspects, near the ridges or where the growth of bamboos is poor.
- ✓ xvi) Felling shall be constantly supervised by a forest official, capable of deciding the silvicultural limits of operations.

6.12 Regeneration: - Bamboo flowering is highly sporadic, therefore production of seed is scarce. Immediately after the gregarious flowering of bamboos as all the clumps dry up, it shall, therefore be necessary to close the flowered area against exercise of all rights to help it to regenerate naturally. Natural regeneration in such an event should be supplemented by planting of seedlings raised in Polythene bags.

6.13 Subsidiary Silvicultural Operations: - Cultural operations are absolutely essential to improve the condition and productivity of the clumps. These operations will be carried out either with the main cuttings or in the year following the cuttings. Very old and large clumps which are obviously past recovery will not be touched and the operations will remain confined to the thrifty and culturable clumps which are likely to respond to treatment. The cultural operations will consist of cleanings and thinning on the following principle:-

- Clumps, raised above the ground or consisting of thin switches will not be touched.
- The operations shall be confined not only to congested clumps but all clumps in need of treatment will also be attended to.
- The interior clumps should be cleaned and opened up to reduce congestion to such an extent that it is possible to see through them.
- In very old and congested clumps where cleaning is considered impracticable, clear felling of the clump in 3 seasons i.e. 1/3 in each season is allowed.
- Dense crown inferior species interfering with the growth of bamboos should be removed. Light crown species like Khair, Semal and Chhal shall be retained.
- The slash collected during the culturāl operations shall be removed to safer places and disposed off either by sale or by burning.
- All climbers damaging the clumps shall be cut.

6.14 Planting: - Since this Working Circle overlaps the other Working Circle as such no separate planting programme has been prescribed for it. The treatment prescribed in the concerned Working Circle will be followed but in the bamboo areas more emphasis will be on the introduction and improvement of bamboo on the principle laid down in this chapter.

6.15 Determination of the age of Culms: - The new culms (*manus*) are produced in the rainy season and as a rule don't attain full size untill September. The following characteristics of the culms based on their appearance in winter should be useful in determining their age.

i) **New or one year old Culms:** - These are the culms sprouted in the last rains. These are uniformly green and have fresh looking brown yellow sheath still adhering to the internodes. There is an abundance of way bloom on the internodes which comes off with light touch. These have either few or no branches

ii) **Two seasons old Culms:** - Culms having sheath of dark grey in colour are 2 seasons old. Sometimes the sheaths hang on to the nodes. The internodes are greenish with a thin patchy grayish white bloom Side branches are present on the nodes.

iii) **Three season old Culms:** - Culm sheaths are usually absent on these culms. The bloom on the internodes is no longer uniform but is variegated by darker blotches and is not readily removed by rubbing The internodes are still green in colour.

iv) **Four seasons old Culms:** - These are darkish green with little or no bloom on cooler sites there are generally big dark blotches on the surface of internodes.

v) **More than four years old Culms:** - These have yellow patches on green surface which are sure signs of their maturity.

6.16 Rights and Concessions: - Local people have rights in almost all bamboo bearing forests for meeting their bonafide requirements. The bamboos are normally available to the required extent but the uncontrolled lopping and un-scientific extraction of bamboos in the past has deteriorated the bamboo clumps which have reached on the verge of extinction in some forests like Plasla. Serious efforts are needed for their improvement. Lopping of bamboos is not to be allowed under any circumstances.

6.17 Miscellaneous: - Record of previous gregarious flowering of the bamboos in these forests is not available. This important information should be recorded in the

compartment history files. Whenever gregarious flowering occurs in any of the areas following steps should be taken:-

- The area under flowering shall be immediately and strictly closed to grazing and exercise of other rights for a minimum period of 10 years.
- Culms in the flowered area will not be cut until the seed has been shed. After the seed has fallen the flowered culms shall be clear felled irrespective of the felling programme. This will ensure safety against fires besides full economic utilization of the produce.
- The entire area shall remain protected against fire.

6.18 Annual Closure:-All the bamboo bearing areas shall continue to remain closed to grazing for 3 months every year during monsoons i.e., form 1st July to 30rd September.

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CHAPTER VII

THE JOINT FOREST MANAGEMENT (OVERLAPPING) WORKING CIRCLE

7.1 JOINT FOREST MANAGEMENT IN HIMACHAL PRADESH In 1985, social forestry was given impetus by the National Social Forestry (Umbrella) Project. The project achieved its objective of planting more than 100,000 hectares of plantations, but physical targets took precedence over participatory objectives, and social and equity issues could not be addressed.

In the 1980s the World Bank-supported Social Forestry project (1984-92) and the Indo-German Integrated Dhauladhar project (1982-92) were taken up in HP. Both were more participatory than previous FD projects. In the 1990s both donors switched their focus to the Shivalik hills with the Indo-German Changer Project that went on till 2005-06, as did the WB IWDP Kandi project.

The framework for JFM in HP is provided by the Government of HP Order of 12 May 1993, which followed the June 1990 Government of India (JFM) Circular enabling the spread of JFM. The HP Order was compiled following study of JFM resolutions issued by other states.

The JFM Order coincided with the development of a donor-led (DFID) project for Mandi and Kullu districts, in which JFM was a key element. This Himachal Pradesh Forestry Project (HPFP) may be seen to have facilitated the introduction of JFM statewide. Donor support to Mandi and Kullu districts continued until March 2001. But as one HPFD officer put it: *"There were no rules and this plagued everything".*

Table 7.1 Growth of JFM in Kullu and Mandi

Year	No. of VFDCs in Kullu	Area (ha)	No. of VFDCs in Mandi	Area (ha)	Total no.	Total area
1995-96	4	1870	-		4	1870
1996-97	4	2685	8	3110	12	5795
1997-98	12	8930	13	5537	25	14467
1998-99	21	12426	35	7134	56	19560
1999-00	14	7000	42	21174	56	28174
Total	**55**	**32911**	**98**	**36955**	**153**	**69866**

In addition in Mandi there are 35 Forest Management Plans (FMPs) covering about 10,500 hectares, and in Kullu there are 21 FMPs covering about 10,000 hectares. While efforts were made to integrate these FMPs into Working Plans and a nascent GIS facility started at FTI, Sundernagar, and talk of using remote sensing for WP writing on the Karnataka model, the whole thing fell through after 2001 with the end of the second phase of the DFID project. At the end of the second phase of the HP Forestry Project in 2001, it was agreed that all the 153 VFDCs formed in Kullu and Mandi would be taken over by the SVY and converted into societies.

Until 1998, JFM in HP was confined to donor-supported pilot activities (DFID, GTZ, World Bank). Then, as in earlier years (see above with illegal timber) the arrival of a new PCCF in 1998 meant the search for a new programme to make a positive public relations impact. Participation was the buzzword from Delhi, and a small group of three or four FD staff were tasked with developing plans for the new scheme. The Chief Minister was persuaded to launch *Sanjhi Van Yojna* (SVY). 'Entry point activities' – such as making pots, water taps, mending temples, small infrastructure developments; all designed to attract people to the project – were given a budget so that DFOs could be seen to be dispensing something worthwhile.

To support the state JFM Order, Participatory Forest Management (PFM) Rules were developed for HP, and notified on 23 August 2001. These Rules make provision for

increasing the institutional autonomy of Village Forest Development Committees (VFDCs) by registering them as Village Forest Development Societies (VFDSs) under the Societies Registration Act. Importantly, the PFM Rules encourage VFDS formation panchayat wardwise thereby attempting to link these bodies directly with the panchayat structure with each elected panch being on the executive committee of the VFDS, *ex officio*. However, the role of the VFDSs continues to be viewed narrowly, focusing mainly on helping the HPFD to police forests and on wage-based micro-plan activities.

This resulted in the 'New SVY' rules and guidelines being announced by the GoHP in August 2001. They contain provisions for VFDSs to become, in legal terms 'the forest officer' (not notified as on July 2011) for levying fines etc, and for 100 per cent share in intermediate usufructs while on final harvest 75 per cent would go to the VFDS and 25 per cent to the panchayat. The GoHP agreed to completely forgo any share from JFM areas.

Under 'New SVY': entry point activities are abandoned but "income-generating activities" introduced; forest guards will not be the member secretary of the Executive Committee; but local organisers – usually led by a literate woman linked to a local community-based organisation, helps mobilise towards a properly representative VFDS based on a panchayat ward. Several meetings are held before a microplan is initiated – this shows VFDS maturity. The FD sends a cheque to a local bank account. The VFDS agrees with the FD to furnish a 'utilisation certificate' which can be monitored and checked.

Since January 2001 the Government of India agreed to bring "better" forests under JFM but how many have actually been included under microplans is not known. Even under FDAs, JFM continues to be restricted to degraded forests.

At the policy level the PFM Rules and SVY Rules and Guidelines of August 2001 are seen as a major step forward, laying the basis for uniformity in approach to community based forest management. It also makes JFM poverty focussed and is targeted to the resource dependent.

In 2003, MoEF started the Forest Development Agencies (FDAs) at district level – with DFOs getting direct access to central funding – for forest and plantation work for employment generation objectives. This is an 100 per cent central sector scheme,

created to reduce the multiplicity of schemes with similar objectives (it merges four existing central schemes), ensure uniformity in funding pattern and implementation mechanism, avoid delays in availability of funds to the field level and institutionalise peoples' participation in project formulation and implementation. FDAs will be constituted at the territorial/ wildlife forest division level, and JFM committees will be the implementing agencies at grassroots level. FDAs are to work through forest guards / deputy rangers- and thus appear to conflict with SVY rules which allow for the member secretary to be elected by the JFMC / VFDS.

The growth of FDAs and therefore of JFMCs since 2003 appears to be fluctuating as figures culled out from various departmental reports indicate. In March, 2003, 670 JFMCs were reported covering a forest area of about 1640 km^2 distributed in RFs, DPFs & UPFs. In March, 2005, 1690 JFMCs are reported covering a forest area of over 4200 km^2. As of December, 2008, 1381 JFMCs stand listed. However, as per field reports only 986 of these are said to be active. Area covered is not mentioned. In March, 2010, a total of 1109 JFMCs have been reported covering again an area of about 4200 km^2. In July 2010, the total number of JFMCs has been pegged at 1270 but how much forest area they cover is not indicated.

7.2 THE LESSONS LEARNT The last three decades of dabbling with JFM / PFM under various EAPs and the homegrown SVY and now the Centrally administered FDA do hold some valuable lessons and insights for the future of participatory natural resource management in the state.

1. PFM should focus in and around pockets of poverty i.e. remote, forested areas (better forests) and where livelihood dependence on forests is high. This would entail several genuine joint management activities (other than plantation) like collective protection against illicit felling, fires, poaching and so forth. Issues of Rights, equity and benefit sharing are better addressed and conflicts resolved.

2. In participatory approaches, the ***process*** is more important than achieving targets. Choosing and regularly training the right persons for the job is therefore critical.

3. Sharing of removals, including resin, intermediate and salvage felling with VFDSs are necessary to establish long term stake of local communities in PFM.

4. Continual policy and Rules adjustment and calibration to promote better market returns for wood and non-wood based enterprises. Example, the recent decontrol of bamboo trade and transit. Next: efficient markets for value added products.

5. Local Leadership – this is a critical role. Successful examples of JFM or CFM show that local leadership roles have been crucial in making the change. It could be an enlightened, accepted local person, an elected representative, a dedicated NGO/ CBO or even a committed forest officer. This is also important for sustainability of groups.

Why consolidate forest committees?

- Allow economies of scale to be applied, reducing the number of micro-plans to be established by one-quarter,
- More economical to produce field maps at a scale smaller than 1:20,000 and identifying all present land uses
- Development issues common to all villages could be addressed in a more efficient, coordinated and economic manner, including road upgrading, health and education, service delivery of agriculture and forestry extension, and minor irrigation,
- Facilitate dealing with common forestry problems
- Promote development of marketing cooperatives or federations, based on economies of scale for product sales, and improve market positions,
- Facilitate training for the communities by covering a larger, yet similar group,
- Support landscape-level forest planning that address conservation and economic goals,
- Allow scope for zoning community forests into areas conducive for timber and pole production, NTFPs, grazing and biodiversity conservation (with limited access).

Source: **Unlocking Opportunities for Forest Dependent People, World Bank, 2006**

7.3 CONCEPT OF PARTICIPATORY FOREST MANAGEMENT The concept of Joint or Participatory Forest Management is an intervention to evolve organized and collective thinking on the issues of forest management keeping in view the fact that the forest resources are limited and the claim over these are varied, no single solution can satisfy the needs of all. The philosophy aims at involving all the stakeholders in resource generation activities through motivation, active involvement in the process of management and sharing of benefits through adequate institutional arrangements.

Joint management of forest lands is sharing of responsibilities, control, decision making authority and products over forest lands between Govt. and local user groups. The primary purpose of PFM is to create conditions at the local level which enable improvements in forest conditions and productivity. It is a movement towards a more

democratic management of natural resources founded on the principle of equity, transparency and social justice.

It is widely acknowledged that the Govt. and development agencies alone can not solve the growing problem of degradation of forests and natural resource depletion. The traditional approach to management worked satisfactorily in the past when the population was less but depleting natural resources have led to the concept and practice of participatory management.

7.4 SPECIAL OBJECT OF MANAGEMENT The basic objects of Joint or Participatory Forest Management are:-

i) To evolve consensus on the basic issues for the conservation of forest resources including soil and water.

ii) To provide an effective treatment for wastelands, degraded forests and forest lands situated near villages through protection, afforestation, pasture development, soil conservation by active participation of local people.

iii) To maintain the environmental stability through preservation of natural resources through involvement of local people in management.

iv) To augment fuel wood, fodder and small timber production for use by local people.

The Govt. of HP has notified Himachal Pradesh Participatory Forest Management Regulations, 2001 and the Sanjhi Van Yojna Scheme, 2001 which have strengthened the JFM approach to a great extent.

7.5 IMPLEMENTATION OF JFM IN BILASPUR DIVISION The JFM approach has been implemented in the division through projects like Overseas Development Administration or DFID & Sanjhi Van Yojna. The micro plans were prepared in accordance with project philosophy and works executed by VFDC/VFDS, the list of which is given in Table 6.1.

Activities like soil conservation, afforestation, village development activities, fire protection, grazing have been undertaken in the past but almost in all cases, the

participation of locals remained upto fund flow only. Most of the committees are totally inactive now. There is a need to revive, activate and involve these rural committees in forest management activities.The list of the JFMCS IN Bilaspur Forest Division is given as below.

S. No.	Name of Range	Name of JFMCs	Area planted through JFMCs
1	Swarghat	Dabat-I	
2	Swarghat	Dabat-II	
3	Swarghat	Dabat-III	
4	Swarghat	Dabat-IV	
5	Swarghat	Illewal	
6	Swarghat	Samtehan	
7	Swarghat	Dahlet-IV	
8	Swarghat	Gwalthai	
9	Swarghat	Jandaur-II	
10	Swarghat	Behal-I	
11	Swarghat	Behal-II	
12	Swarghat	Behal-III	
13	Swarghat	Kudini	
14	Swarghat	Tiun	
15	Swarghat	Manjher	
16	Swarghat	Dabhetta	
17	Swarghat	Nal	
18	Swarghat	Dagrahan-II	
19	Swarghat	UF Khurgal	
20	Swarghat	Bhater	
21	Swarghat	Tanbol	
22	Swarghat	Jeor	
23	Swarghat	Chelli	

24	Swarghat	Dagrahan-I	
25	Swarghat	Rauna	
26	Swarghat	Chamb Bhujan	
27	Swarghat	Malaun	
28	Swarghat	Kathla-I	
29	Swarghat	Kutehla	
30	Swarghat	Matnoh	
31	Swarghat	Kathla-II	
32	Swarghat	Dadwal	
33	Swarghat	Khurani	
34	Swarghat	Dagrahan-III	
35	Swarghat	Dhanswai	
36	Swarghat	Talli	
37	Swarghat	Bassi	
38	Swarghat	Gara	
39	Swarghat	Katirarh	
40	Swarghat	Tarwar	
41	Swarghat	Sinwa Sadha	
42	Swarghat	Meoth-II	
43	Swarghat	Meoth-I	
44	Swarghat	Pangwana	
45	Swarghat	Bhuwai	
46	Swarghat	Ree	
47	Swarghat	Kharian	
48	Swarghat	Dollan	
49	Swarghat	Behrera	
50	Swarghat	Nand Behal	
	Total Area planted (w.e.f. 2003-04 to 2006-07		**1500 Hac.**

51	Swarghat	Jamli	
52		Kacholi	
53		Patta	
54	Ghumarwin	Bari Majjherwan	
55	Ghumarwin	Nain	
56	Ghumarwin	Takrehra	
57	Ghumarwin	Rohin Bhyatar	
58	Ghumarwin	Panol Chowri	
59	Ghumarwin	Tantha	
60	Ghumarwin	Tundwin	
61	Ghumarwin	Randoh	
62	Ghumarwin	Challelli	
63	Ghumarwin	Baldwara Bhan	
64	Ghumarwin	Gharwasra Miun	
65	Ghumarwin	Jblayana	
66	Ghumarwin	Gwal Muthani	
67	Ghumarwin	Malywar	
68	Ghumarwin	Nain Gujrran	
69	Jhandutta	Changer Talal	
70	Jhandutta	Jhabolla	
71	Jhandutta	Kuthera	
72	Jhandutta	Kallar	
73	Jhandutta	Malagan	
74	Jhandutta	Jhamradian	
75	Jhandutta	Malari	
76	Kalol	Bakian	
77	Kalol	Kalol	
78	Kalol	Jhareri	
79	Kalol	Kharian Bharari	
80	Kalol	Tihri	
81	Kalol	Dholag Chaknar	
82	Kalol	Gah	

83	Kalol	Paploa	
84	Kalol	Buhar	
85	Bharari	Kaloh	
86	Bharari	Himmar	
87	Bharari	Kotlu	
88	Bharari	Padyalag	
89	Bharari	Chokhna	
90	Sadar	Kharsi	
91	Sadar	Karot	
92	Sadar	Sayar	
93	Sadar	DharTatoh	
94	Sadar	Solag	
95	Sadar	Jurasi	
96	Sadar	Soldha	
97	Sadar	Malothi	
98	Sadar	AshaMajari	
99	Sadar	Seola	
100	Sadar	Luharda	
101	Sadar	Sumari	
	Total area planted during 2011-12		**93**
	G.Total area planted through 101 JFMCs		**1593 Hac.**

(Source: Office record DFO Bilaspur)

7.6 FUTURE SCOPE

7.6.1 There is tremendous scope for the JFM activities in the division. All the forests allotted to the plantation and protection working circles are suitable/ potential sites for afforestation, soil conservation, grassland improvement, NTFP development besides other forests.

7.6.2 IDENTIFICATION OF JFM AREAS The degraded forest areas as well as common village land located in the vicinity of the villages are potential sites for JFM implementation. The deficiencies and strengths of these areas with regard to soil condition, water availability, grazing pressure, fuel wood production and requirements need to be understood. While touring the division, the following Panchayats, beats have been identified and are recommended for adopting JFM approach in future. The list is indicative only and the DFO is at liberty to include or exclude any area while implementing the JFM approach.

7.6.3 NON TIMBER FOREST PRODUCE JFM can play an important role in collection, marketing and propagation of NTFPs. Many villagers are dependent on the collection of NTFP to sustain their livelihood. They usually collect various medicinal herbs and sell it to the middleman who further sells in the market. The various medicinal herbs that are found or can be introduced in the tract, their method of cultivation, collection, harvesting have been discussed in Chapter V.

7.7 POTENTIAL ACTIVITIES OF JFM COMMITTEES The JFM/PFM committees are the future agencies of forest development, conservation and expansion. The potential activities to be executed through JFMCs can be:-

- Afforestation activity (both departmental and MNREGS)
- Soil & water conservation through treatment of macro and micro watersheds in a catchment.
- Recharging of water bodies like boulies, ponds and underground water.
- Minor construction works of road, paths, and buildings.
- Awareness programme for forest protection, fire protection ,propagation of medicinal herbs on a larger scale

- Livelihood options like bee keeping, mushroom cultivation, vermicomposting, cutting & pruning etc. through effective training.
- Collection, value addition and marketing of NTFP.

7.8 **MODE OF WORKING** Traditionally Forest Department has been involved in protection of forests and the concept of involving people in forest management is relatively recent in Forest Department. Forest Department especially Forest Guards who have more regular and direct interaction with people have to adopt 'carrot and stick policy' which is not always easy. Thus it is desirable to involve local CBOs, NGOs etc. in implementation of programmes involving 'people'. Forest staff is not imparted specialized training on participatory management of natural resources, which is vital for success of any people centric programme. To start with the mode of working could be as follows which will further evolve with time:

i) **'USER GROUPS':** Whenever a plantation is raised or a water harvesting structure is constructed, it must be in consultation with local people, essentially with their end user. Such people should be constituted into User Groups, who will maintain assets, use them and if need be extend them. Thus Forest Department will be not only relieved of its function of monitoring each and every small plantation/ structure but will also be in a better position to connect with people. Such user groups will be registered and will have an account. Thus the budget received for plantation/ WHS etc can be directly transferred to their account. However, FD will monitor the quality of work and give technical guidance. Plants will be provided from departmental nurseries

ii) **Vermicomposting** : In departmental nurseries a large amount of vermicompost is required (approximately to the extent of 500 tons for 0.5 ha nursery) and this demand is difficult to meet with departmentally. Thus training may be imparted to local people preferably to women on vermicomposting (without construction of cemented structures as discussed in Chapter II, Part II) and the department can give them buy back assurance. This will give a livelihood option to local people.

CHAPTER – VIII

WILDLIFE CONSERVATION (OVERLAPPING) WORKING CIRCLE

8.1 General: - Forest management cannot be considered complete without including Wildlife protection in it. It should be clearly recognised that existence of plant life and animal life in which animals, birds and reptiles are included is inter dependent. Every kind of species has its own place in nature's Plan. Bilaspur Forest Division is gifted with variety of vegetation & ideal habitat suitable for a great variety of Wildlife the details of which have been described in Chapter-II of part-I of this plan.

8.2 Need for the Protection of Wild Life: - The protection and preservation of Wildlife is essential due to the following reasons.

Cultural & Aesthetic

i) The various Wildlife creatures whether animals, birds, insects, reptiles, fish or amphibia should be preserved because they are part of our heritage and because knowledge of them and acquaintance with them is part of our culture. They also give peculiar aesthetic joy and pleasure in shooting, fishing, photography and even in mere sight seeing.

ii) Economic And Scientific: - Many industries are based on the products of Wildlife like skins, horns, musk etc. Monkeys, hare etc. are used in medical research and in the search for cure of the diseases that afflict the human race. Tourism based on Wildlife is also progressing these days. Thus a large number of people are dependent for their livelihood directly or indirectly on wildlife.

iii) Ecological: - The preservation of wildlife is essential for the maintenance of balance of nature. The reduction of the natural food of the leopards through excessive killings of their natural prey i.e. deer and pigs results in their becoming cattle lifters. On the other hand elimination of carnivores in turn results in the multiplication of the population of herbivores doing much damage to the agricultural crops.

8.3 Wild Life Management:-The management of Wildlife in sanctuaries falling in this Division is with the Wild Life Wing of the Department and in all other forests it is being looked after by the territorial staff. The increasing pressure of human and cattle population is constantly making in roads into the Wild Life habitat. As a first step towards preservation of Wildlife, the Himachal Pradesh Govt., has imposed a complete ban on hunting of Wild animals and birds since 1983-84. This has helped in rejuvenating the

wildlife in some posts of the tract. So much so in certain pockets the leopard menace is now being increasingly reported. Many leopards are reported to become cattle lifters. Table 8.1 show the different animals killed in the last six years by leopards in different Ranges of this Division.

TABLE 8.1

Data of Cattles killed and human injuries caused by the attack of Wild Animal w.e.f. 1994-1995 to 2009-2010 and compensation paid thereof. Data in respect of Bilaspur Forest Division

Year	Human injuries	Bufallow	Cows	Ox/ Calf	Horse/ mule	Goat/ Kid	Sheep lamb & pig	Total No. of animal killed	Compensation paid
1994-1995	0	4	8	15	2	152	31	212	7[illegible]
1995-1996	0	10	3	12	2	103	27	157	74[illegible]
1996-1997	1	12	11	19	3	205	11	261	127[illegible]
1997-1998	0	5	7	5	1	162	13	193	103[illegible]
1998-1999	4	11	11	6	1	228	8	269	141[illegible]
1999-2000	0	3	2	13	1	128	7	154	60[illegible]
2000-2001	0	8	2	14	3	115	7	149	84[illegible]
2001-2002	5	7	8	6	6	85	9	126	101[illegible]
2002-2003	4	4	5	2	5	24	1	45	64[illegible]
2003-2004	2	2	0	3	0	26	0	33	20[illegible]
2004-2005	1	4	2	3	0	64	0	74	43[illegible]
2005-2006	1	0	1	1	0	8	0	11	7[illegible]
2006-2007	3	7	5	4	2	59	0	80	62[illegible]
2007-2008	6	3	4	3	1	6	0	23	126[illegible]
2008-2009	6	4	1	4	1	22	1	39	199[illegible]
2009-2010	7	6	7	1	0	50	0	71	196[illegible]
2010-2011	27	0	4	2	1	10	0	17	149[illegible]
2011-2012	30	3	9	5	1	78	1	97	317[illegible]

8.3.1 From the analysis of the above table it is revealed that maximum damage has been done in

Sadar Range followed by Ghumarwin Range. The main reason of this damage is attributed to the shortage of natural prey of the leopards because of:

- Grant of nautors to Bhakra Dam and Barmana Cement Factory oustees, landless people, encroachments, excessive grazing by the ever increasing live stock of the local and migratory graziers in the forests. Due to this disturbance the herbivora migrated from the area on a large scale.
- Illegal hunting and shooting by the poachers and use of better arms in the garb of crop protection has aggravated the position further.
- Disturbance to sanctum sanctorum of wildlife in forests which are now easily accessible by roads and paths.

8.4 Preservation of Wild Life: - For the preservation of wildlife the following measures are suggested to be undertaken. In fact most of these have been included in the management of forests in different working circles of this plan.

- To close the areas against grazing and make available sufficient grass for the Wild Life.
- To raise mixed plantations instead of pure plantation so that Wildlife may get appropriate shelter.
- Moratorium on fellings in a strip of 30 meters on either side of the road and nallahs to reduce disturbance to Wildlife.
- To retain some dry and hollow trees for the wildlife like squirrels to live there.
- To control burn the water logged areas for inducing the fresh grasses.
- To undertake soil and water conservation measures in the catchment area of Sutlej so that wildlife may get water throughout the year.

8.5 Protection of Wild Life: - After independence and merger of princely State of Bilaspur with Himachal Pradesh, the Punjaf Wild Birds and Wild Animal, Act of 1933 was extended to the forests of this Division. Separate rules under this act were notified in the year 1958. These rules remained in force till the new central wildlife (Protection) Act 1972 was adopted in the State on 2.4.1973. New rules under this act were framed and made effective from 24.2.1975. The notification regarding these rules as well as the

wildlife (Protection) Act 1972 and various amendments have been given in Himachal Pradesh Forest Manual Vol.-I and may be consulted for details.

8.5.1 Salient Features of Wildlife (Protection) Act:

- Constitution of State Wildlife Advisory Boards to advise the state Govt.
- In selection of areas to be declared as sanctuaries, National Parks, Game reserves, closed areas and their administration.
- In formulating the policy of granting licenses and permits under this act and other such allotted matters.
- Lays clown procedure for the creation of sanctuaries, National Parks, Game reserves and closed areas and also guide lines for their management.
- Appointment of chief wild Life warden and other officials.
- Lays down rules for hunting of Wild animals and grant of hunting permits.
- Provides for control on trade or commerce in Wild animals, animal articles and trophies.

8.6 Wildlife Sanctuaries: - There are two wildlife sanctuaries in this Division namely Shri Naina Devi and Gobind Sagar . The Sh. Naina Devi wild life sanctuary is under the control ofDFO Wild life division Hamirpur & the Gobind Sagar Wild Life Sanctuary is under the control of Divisional Forset Officer Bilaspur. The details of these sanctuaries have been given in para 2.63 of Chapter-II of Part-I of this plan. **The number of different Wild animals and birds counted in Naina Devi Sanctuary during the latest 1990 Wild Life Census are depicted in Table 8.2 :-**

Table 8.2 (WILD LIFE INFORMATION)

1.	Leopard	14
2.	Wild boars	32
3.	Barking deer	85
4.	Sambhar	69
5.	Ghoral	50
6.	Wild hares	15
7.	Monkeys	370
8.	Apes	813
9.	Jackals	14
10.	Mangoose	1
11.	Snake	1
12.	Porcupines	3
13.	Pea Fowls	17
14.	Red jungle fowls	331
15.	Kalij Pheasants	131
16.	Pigeons	14
17.	Black Partridges	2

Table 8.3

Data of Monkeys in Bilaspur Division as per 2011 census

Name of Range	Name of Beat	Nos of Locations	Adult	Infant	Total
Jhandutta	Samoh	5 Nos.	376	134	510
	Jhandutta	2 Nos.	108	30	138
	Rahan	2 Nos.	285	75	360
	Jhaulla	3 Nos.	200	65	265
	Berthin	2 Nos.	74	46	120
	Barwar	2 Nos.	44	20	64
	Thuran	1 No.	25	8	33
	Gochar	3 Nos.	41	28	169
	Jhabola	1 Nos.	78	6	84
		Total:	**1231**	**412**	**1743**

Kalol	Dhani	2 Nos.	219	111	330
	Kharli	3 Nos.	274	131	405
	Amrotan	5 Nos.	580	370	950
	Chalawa	2 Nos.	184	121	305
	Kalol	2 Nos.	85	55	140
	Gah	2 Nos.	168	102	270
	Malraon	2 Nos.	209	131	340
	Tihri	2 Nos.	83	47	130
	Kulziar	2 Nos.	138	102	240
	Bachhretu	3 Nos.	149	94	243
	Koserian	1 Nos.	84	41	125
	Duhak	1 No.	39	31	70
		Total:	**2212**	**1336**	**3548**
Bharari	Bharari	1 No.	100	85	185
	Kamloti	2 Nos.	70	24	94
	Maryani	2 Nos.	100	42	142
	B/ Ghat	1 Nos.	100	83	183
		Total:	**370**	**234**	**604**
Sadar	Lakhanpur	6	179	46	225
	Kothipura	2	90	25	115
	Binaula	3	93	16	109
	Markand	4	139	22	161
	Kuddi	5	172	45	217
	Brahmpukhar	8	352	147	499
	Namhol	4	268	96	364
	Deoth	4	228	76	304
	Bahadurpur	2	196	56	249
	Chhakoh	3	95	22	117
	Bathoh	2	148	28	176
	Panjgain	7	232	60	292
	Mugrani	2	152	37	189
	Chamyoun	2	146	34	180
	Jamthal	3	72	15	87
		Total:	**2562**	**725**	**3283**
Swarghat	Chharol	3	190	52	242
	Kacholi	1	242	89	331
	Kallar	1	182	41	223
	Swarghat	6	318	69	387
	Baner	3	137	23	160
	Zakatkhana	5	379	56	435
	Swahan	3	245	55	30
	Garamora	3	262	41	303
	Behal	2	146	23	169
	Bassi	1	46	12	58
	Dabat	1	124	28	152

	Dharot	1	50	19	69
	Gwalthai	2	73	12	85
	Samtehan	1	93	17	110
	Jandraur	2	188	37	225
		Total:	**2675**	**574**	**2979**
Ghumarwin	Panol	1 No.	85	25	110
	Takrera	2 Nos.	102	21	123
	Ghumarwin	0	0	0	0
	Sandiar	0	0	0	0
	Paniyala	5 Nos.	474	66	540
	Mehri Kathla	6 Nos.	1443	215	1658
	Tantha	4 Nos.	200	22	222
	Harlog	4 Nos.	398	68	466
	Malyawar	2 Nos.	38	2	40
	Dangoo	0	0	0	0
		Total:	**2740**	**419**	**3159**
		Grand Total:	**11790**	**3700**	**15316**

		ABSTRACT RANGE WISE			
	Sr. No.	**Name of Range**	**Adult**	**Infant**	**Total**
	1	**Jhandutta**	**1231**	**412**	**1743**
	2	**Kalol**	**2212**	**1336**	**3548**
	3	**Bharari**	**370**	**234**	**604**
	4	**Sadar**	**2562**	**725**	**3283**
	5	**Swarghat**	**2675**	**574**	**2979**
	6	**Ghumarwin**	**2740**	**419**	**3159**
		Total:	**11790**	**3700**	**15316**

8.6.1 Management Staff :- Sh. Naina Devi wild Sanctuary comes under the administrative control of Divisional Forest Officer (Wildlife), Hamirpur and the Gobind Sagar Wild Life Sanctuary comes under the administrative control of Divisional Forest Officer Bilaspur.

8.6.2 Rationalization of Boundaries: - Under rationalization of Boundaries of Protected Areas in Himachal Pradesh, It has also been proposed to rationalize the boundary of these Sanctuaries. The case for the denotification of the Gobind sagar wild life sanctuary has been sent to the Govt. of India in the year 2011 & the outcome is still awaited. Similarily the rationalization of the boundaries of Sh. Naina Devi Wild Life Sanctuary have also been sent to the G.O.I. The decision is awaited. In Naina Devi Wildlife Sanctuary an area

of 47.73 sq.km has been proposed for exclusion and remaining area of 17.01 sq km has been proposed for conservation reserve.

8.7 Injuries to which fauna are liable: - The fauna of the tract is decreasing due to reduction of the habitat as a result of ongoing development activities. The need of growing population is the cause of animal-human conflict. The normal living conditions of the wild life are disturbed which is a matter of concern. The following are the hazardous influences threatening the wild life:-

1. Development Activities: - The state is in the development phase and the road, path construction is the main activity which in turn is slowly damaging/destroying the natural habitat. The tendency to expand the cultivations into the forests/ natural habitat of wild life is another cause of animal-human conflict.

2. Hunting: - In spite of complete ban on hunting, the stray incidences of hunting wild animals do take place particularly, when the animals migrate to lower elevations due to unfavorable conditions. The damage to orchards and agriculture crops prompts local people to resort to hunting.

3. Fires: - Forest fires destroy the habitat and the wild animals are trapped, killed. The fires destroy the eggs, young ones in the hollow rocks, dead stumps and nest built in stumps and on ground.

4. Climatic Conditions: - Sometimes the adverse climatic conditions like heavy rains, heavy snow, and prolonged drought affect the wild animals particularly the young ones.

8.8 Man Animal Conflict: - Most of the cases of man -animal conflict pertain to leopard killing livestock at the animal sheds and child lifting. Habitat degradation, shrinking space and shortage of food often forces the wild animals towards populated areas and it has resulted into the loss of lives of domestic animals as well as property local people. Due compensations were granted to the grieved family. The cases of killing the domestic animal and cattle are reported every year. For the last 10 years around 200 cattle/sheep/goats were killed. An amount of about Rs. 5.50 lakhs was paid as compensation to the affected. Of late the monkey menace has been increasing in the rural areas, destroying the crops sown. In order to ameliorate the situation, plantation of fruit bearing trees is to be encouraged in the forest areas. Few stray incidences of black bear attacking human beings have also been reported in last ten years. As a long term strategy, habitat improvement can be done by planting fruit trees in the forest areas. In recent years a few cases of monkey biting have also been reported. As in other parts of the state,

monkeys are attracted to towns and other habitation for easy availability of food which is catered to them by piles of garbage lying in open. To address this issue, proper management of garbage needs to be done.

8.9 Measures for Protection:-Wildlife tourism is the latest trend being extensively projected in the state. The complete check on poaching through local people participation is the key for protection. The road communication has increased the menace of hunting. The following measures are suggested:-

- ✓ Renewal of existing arms licenses and grant of new ones to be judiciously done.
- ✓ Adequate staffing, particularly of FGs is a must for the protection of wild life.
- ✓ Seeking public cooperation and rewarding informers who help apprehending poachers.
- ✓ Addressing the problem of crop damage by wild life on priority.
- ✓ Wide publicity for wildlife protection. Services of retired teachers, ex-servicemen, NGOs should be taken for this onerous task.

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CHAPTER-IX

THE SOIL AND WATER CONSERVATION (OVERLAPPING) WORKING CIRCLE

9.1 General:- Bilaspur Forest forms the direct catchment of Gobind Sagar and Sutlej river. Indiscriminate land use, irrational method of cultivation, destruction of forests and over grazing have led to heavy soil erosion in this hilly catchment. Besides setting up of a cement factory at Barmana, and construction of large number of roads and buildings have aggravated the problem. These activities have created serious imbalance in the eco-system. According to a study conducted by the Bhakra Beas Management Board authorities, Gobind Sagar is getting silted up at the average annual rate of 3318 ha meters. It is estimated that life of Bhakra Dam constructed on Sutlej river in 1963 will now be 152 years only for electricity production. If no serious efforts are made to arrest this rate of erosion the consequences will be disastrous. Sedimentation studies of various reservoirs have lent support to the view that a vigorous and concerted action is indispensable for prolonging the life of dams. The works of soil and water conservation in this division are being done under River Valley Project a Centrally Sponsored Scheme of Government of India since the IIIrd five year plan.

9.2 Objectives:- The objectives of management will be:-

i. To check soil erosion and minimize silt flow in Gobind Sagar with a view to prolong the life of Bhakra Dam.
ii. To improve land capability and moisture regime in the Watershed.
iii. To prevent the degradation of catchment by adopting multi-disciplinary integrated approach.
iv. To increase the productivity through optimum land use management.
v. To reduce peak flow into the river system by reducing the run off from the catchment.
vi. To ensure adequate irrigation of command area for increasing production.
vii. To upgrade the skills in planning and execution of land development programme and also to seek the involvement of people connected with the watershed.

9.3 Strategy:- To achieve the above objectives, the strategy should comprise of the following actions:

i. Adoption of a project approach for the treatment of Catchment.

ii. Integration of sectoral measures for comprehensive watershed development and maintenance.

iii. Consolidation of treatment efforts through projectisation approach and proper choice of work areas.

iv. Emphasis on sustainability of treatment measures.

v. Higher thrust for construction of strategically located structures (Light check dams) along drainage lines to retard velocity of run off and to impound water in the watershed.

vi. Involvement of the population, dependent on a watershed in the planting and execution from time to time of its development.

vii. Measures for sustaining the benefits of treatment through institutional and operational mechanism.

viii. Promotion of skils of farmers and field functionaries through appropriate institutional linkage and

ix. Effective administrative arrangements for direction, control and co-ordination of the programme.

9.4 Approach:- The treatment of watershed is to be planned on a project basis. For this purpose watershed has been divided into sub watersheds comprising an area of 20 to 40 sq.k.m. Each sub watershed has been assigened a code number and a definite local name. The code number is based on classification system of all India Land Use Survey organization. The treatment of each sub watershed is phased over a period of 3 to 5 years so as to saturate the whole watershed in a periodic of 5 years.

9.5 Selection of Area for Treatment:- The All India Soil and Land use survey organization surveyed the Sutlej Catchment for the assessment of erosion intensity in 1976. According to the magnitude and criticality of degradation, the sub watersheds have been categorized into very high, medium, low and very low areas. The categorization of the areas surveyed of this Forest Division is as under:

Grading	No. of watersheds	Area in ha.	Percentage of total area surveyed of Bilaspur Forest Division

a. Very high	29	49130	61.23
b. High	7	8884	11.07
c. Medium	7	13200	16.45
e. Low	4	8040	10.02
f. Very low	1	988	1.23
	48	80242	100.00

List of erosion prone areas of Bilaspur Forest Division

S.No	Name of Range	Beat	Name of Forest	Area
1	Bharai	Nihari	C10 Nihari	23.20
		Maryani	C5b Tiamblo	29.60
		Kamloti	C2a Kamloti	60.40
		Kamloti	C3c Chokna	24.00
		Mohra	DPF Karloti I	8.13
		Badahaghat	C13 a BadaGhat	28.40
		Badahaghat	C15 Doon	24.80
		Hatwar	DPF Hatwar	1.68
		Hatwar	DPF Kotlu	1.00
		Bharari	DPF Barog	6.63
		Bharari	DPF Lanjta I	2.79
		Bharari	DPF Thandora	3.92
	Jhandutta	Dhad	C8 g Dafer	15.80
		Dhad	DPF Dahad	17.34
		Dhad	DPF Tikkri III	2.39
		Thuran	DPF Rachhera	31.34
		Dhad	DPF Kalshai I	1.65
		Dhad	C6 B Mekhwin	3.70
		Jhaula	C7 Jhaula	24.00
		Barthin	DPF Ree	10.67
	Sadar	Jamthal	DPF Jamthal Cia	61.80
		Chamyoun	DPF Chamyoun C2a	100.20
		Markand	UPF Mangrot I	40.74
		Kuddi	DPF Buryans C5b	90.00

		Kuddi	DPF Brathu I	2.60
		Deoth	UPF Bhajoon	62.42
		Namhol	DPF NiharKhan Basla	17.56
		Namhol	DPF Dagsach	19.43
		Binola	UPF Binola	2.29
	Ghumarwin	Dhangoo	C4 Ghan	166.80
		Dhangoo	C1 Umri	47.20
		Pannoul	CI Osal jaman	62.40
		Pannoul	DPF Amarpur III	12.34
		Harlog	C5 b Harlog	32.40
		Takrera	DPF Rohan I	2.03
		Takrera	DPF Roain II	5.11
		Sadyar	C18 Sadyar	121.20
		Ghumarwin	DPF Badota	21.93
		Paniala	DPF Raw I	8.45

9.5.1 The details of sub watersheds identified on the basis of very high and high priority categories for treatment in this division are as per table below:-

TABLE-9.1

STATEMETN SHOWING VERY HIGH AND HIGH PRIORITY WATERSHEDS

S. No.	Code	Area in hac	Priority No.	Remarks
a) Very High Priority				
1	Sg 1b	1236	2	
2	Se 2f	1080	3	
3	Sg 1a	1740	4	
4	Sf 2a	2072	5	
5	Sf 1c	1184	6	
6	Se 2j (Part)	2060	8	
7	Se 2d	2188	9	
8	Se 1a	1560	11	
9	Sc 3f	1532	13	

10	Sc 3h	3092	14	
11	Se 1b	1400	22	
12	Se 2g	1130	24	
13	Sc 1b	1448	26	
14	Se 2h	1384	28	
15	Se 2b	1336	31	
16	Se 2i	1644	32	
17	Sc 3k	4944	35	
18	Sf 1a	892	36	
19	Se 1c	1952	39	
20	Sb 2a	1256	40	
21	Sc 1e (Part)	1244	45	
22	Sc 1a	2268	50	
23	Sc 3a	2300	52	
24	Se 1d	992	56	
25	Sf 1b	1568	62	
26	Se 2c	1916	74	
27	Sd 2a	472	78	
28	Sc 31	1148	83	
29	Sf 1e	2092	85	
	Total Area:-	**49130**		
b) High Priority				
1	Sc 3g	1988	93	
2	Sc 3e	1312	106	
3	Se 2e	1592	115	
4	Se 2a	1288	117	
5	Sc 3c	988	118	
6	Sb 2b	388	119	
7	Sc 2b	1328	139	
	Total Area:-	**8884**		
	Total Area a & b	**58014**		

9.8 Status of Soil Conservation Works:- The soil conservation works in Sutlej Catchment were started with the implementation of IIIrd five year plan. Funds under different schemes in River Valley Project went on increasing for intensive working. From IVth plan onwards special attention was paid towards soil conservation works when salutation of Bhakra Dam rose alarmingly high.

9.8.1 There are in all 36 sub watersheds having very high and high priority status with an area of 58014 ha. Out of these, 15 sub watersheds covering an area of 25348 ha. have so far been treated and thus shed off. To get the maximum benefits in the years to come, maintenance of works carried out is done up to 3-5 years depending upon the locality and availability of funds.

9.9 Organisation And Co-ordination:- Departments of Forest and Agriculture are involved in the implementation of River Valley Project Schemes. The former is nodal agency. Except for a brief between 1981 to 1984 when the soil conservation works were carried out through a specially created soil conservation Department with personals drawn from both the departments, each department has its own field set up. Under Forest sector soil conservation works are carried out through territorial administration units under the over all supervision of Chief Conservator of Forests (Planning and Development). There is one Conservator of Forests Soil (Headquarters), three Deputy Conservators of Forests to assist Chief Conservator of Forests (Planning and Development) in this task. Agriculture land is being treated under the over all supervision of Director of Agriculture Himachal Pradesh. He is assisted in this task by District Agriculture Officers and Assistant Soil & Conservation Officers in the field. From the year 1993-94 Horticulture Component has also been included in the centrally sponsored scheme which is being looked after by the Director Horticulture Himachal Pradesh with the help of District Horticulture Officers.

9.10 Monitoring And Evaluation:- Data in the prescribed proforma is maintained at the Division and State level. It is submitted to Govt. of India through periodical reports where it is studied and evaluated to ascertain whether the programme is going according to the approved work plans or not. Data in respect of bench marks which have been identified for the evaluation of the project is collected annually to make a judgement of the fulfillment of the objectives and the extent to which these have been achieved.

Hydrologic and sediment monitoring data on run off and sedimentation by empirical methods at the exit point of watersheds is collected at the time of under taking the watershed for implementation and there after annually along with rain fall data during rains for assessing the effectiveness of the treatment measures. The progress of implementation and evaluation of the schemes is also reviewed in the meetings at state and National levels, through periodically visits by the Regional, State and National level functionaries and also the joint inspection teams constituted from the all concerned departments for the purpose.

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CHAPTER-X

THE NTFP (OVERLAPPING) WORKING CIRCLE

10.1 Special objects management:-

- To document important NTFP species found in the division.
- To preserve and improve the quaintly and quality of NTFPs in the division and manage them on a sustainable basis.
- To preserve & develop the resource base for food security of wildlife.
- To decide and adopt strategies for the above purpose in the changing context like climate change.

10.2 The list of important NTFP available in Bilaspur Division:

Sr. No.	Common / Local name	Botanical name	Type	Part used	Uses
1.	Rati	*Abrus precatorius*	Climber	Seed/ Root	Bruised seeds are poisonous, seeds are used as purgative, emetic, aphrodisiac and used in nervous disorder. Root is known as Indian liquorice.
2.	Khair	*Acacia catechu*	Tree	Heart wood	Yield 'Katha' used as astringent, digestive, used in cough & diarrhea. Externally applied to boils & eruptions on skin.
3.	Babul, Kikar	*Acacia nilotica*	Tree	Bark	Used for its demulcent effect. An ingredient of bases is used for pastilles & lozenges.
4.	Puthkanda	*Achyranthes aspera Linn*		Entire plant	Used in cough & a decoction in given in dropsy & bronchial infection.
5.	Bansa, Basuti	*Adhatoda vasica*	Herb	Leaves, flowers	Used in treatment of cough, Asthama, Opthalmia.
6.	Bel	*Aegle marmelos*	Tree	Fruit	Fruit is chiefly used in chronic diarrhea & dysentery, sweet drink soothing for intestines. The ripe fruit is stringent, digestive & stomachic. Leaves are useful in diabetics.
7.	Ramban	*Agave Americana*	Shrub	Leaves and stem	Fiber for rope making
8.	Kikki, Siris	*Albizzia lebbeck*	Tree	Root, Bark, Flower	Used in hemicranias, cooling, Alexiteric, anthelmintic, in asthma & snake bite.

9.	Barbadis akie, Ghikawar	*Aloe barbedensis*	Shrub	Leaves	Source of resinous drug which is used as purgative.
10.	Janmani, Jonkmari	*Anagalis arvensis*			Entire plant
11.	Kateli, Shialkanta, Mexican prickly, poppy	*Argemone Mexicana*			Roots, Seeds. Juice of plant
12.	Barna, Jau	*Artenisia scoparia waldst. & kit*			Fruits and leaves
13.	Kakatudi, Kauradoodi	*Asclepias curassavica Linn*			Roots/Juice of leave
14.	Safed musli	*Asparagus adcendens/ Roxb*			Root
15.	Dante	*Baliaspermum montanum Muell*		Shurb	Roots/Seed
16.	Tadrelu	*Barleria cristata*		Shurb	Roots & leaves
17.	Kaliar, Lal Kachnar	*Bauhinia purpurea Linn*		Tree	Root. Bark, Folwer
18.	Maljhan. Tour	*Bauhinia vahlii*		Tree	Seed
19.	Kachnar	*Bauhinia variegata*		Tree	Bark
20.	Kashmal	*Berberis lyceum*		Shrub	Roots
21.	Phutium	*Bidens pilosa*			Flower
22.	Bimol, Ciar, Khaksha	*Boehmeria platyphylla*		Shrub	Bark
23.	Simal	*Bombax ceiba*		Tree	Wood/ Root
24.	Dhak, Palas	*Butea monosperma*		Tree	Wood/ Bark of roots/ flower
25.	Ak	*Calotropis procera*		Shrub	Roots/ leaves
26.	Bhang	*Cannabis sativa*		Shrub	Leaves/ flowers
27.	Amaltas	*Cassia fistula*		Tree	Pods, Root, bark
28.	Kandiari	*Caesalpinia sepiaria*		Climber	Seed/ bark
29.	Daia	*Callicarpa macrophylla*		Shrub	Leaves
30.	Heart pea, kanphuti	*Cardiaspermum halicacabum*			Root/ Leaves
31.	Chilla	*Casearia tomentosa*		Tree	Wood/ Fruit
32.	Chaksu	*Cassia absus*			Leaves
33.	Chakunda, Kasonda	*Cassia occidentalis*		Weed	Roots
34.	Panwar Chakunda	*Cassia tora*		Weed	Leaves
35.	Malkangi	*Celastrus paniculata Wild*		Climber	Seed/ Leave
36.	Somraj	*Centratherum anthelminticum*		Herb	Seeds
37.	American worm seed	*Chenopodium ambrosiodes*		Herb	Entire plant

38.	Mush kapoor	*Cinnamomum camphora*		Tree	Tree
39.	Akanadi Harjori	*Cissampelos pareira*		Climber	Tree
40.	Lanjai	*Clerodendron inerme(L) Gaerth*		Shurb	Leaves and roots
41.	Dughi, Karanta	*Cryptolepis buchanani*		Climber	Milk
42.	Akas-bel, Sarag bali	*Cuscuta reflexa*		Climber	Leaves
43.	Mirchagandh	*Cymbopogon martini*		Grass	Roots/ Leaves
44.	Kaladhatura	*Daturametel Linn*		Shrub	Leaves, Flowering tops and seeds
45.	Thorn apple,Safed Dhatura	*D.stramonium Linn*		Shrub	Leaves, Flowering tops and seeds
46.	Nirbisi	*Delphinium denudatum wall*		Shrub	Roots
47.	Potatoyam , gaithi, Ratalu	*Dioscorea bulbifera Linn*			Tubers
48.	Bhangra Mochkand	*Eclipta alba Hassk*			Entire plant
49.	Amla, Aonla	*Emblica officinalis*		Tree	Fruit
50.	Dhaul ,Dhak, Madar, padyara	*Erythrina suberosa*		Tree	Wood
51.	Laldudhi	*Euphorhbis hirta*		Shrub	Entire plant
52.	Pipal	*Ficus religiosa*		Tree	Bark
53.	Kangu	*Flacourtia indica*		Shurb	Seed
54.	Pit- papra	*Fumaria parviflora Lam*			Entire plant
55.	Goose grass	*Galium aparine*			Entire plant
56.	Glory, Lilly, kalihari	*Gloriosa superb*		Herb	Tubers leaf juice
57.	Marorphali	*Helictris isora*		Shurb	Fruit/ Bark/ Root
58.	Kura	*Holarrhena antidysentrica*		Tree	Seed/ bark
59.	Kathi, Hakna, Nil.	*Indigofera pulchella*		Shrub	Root
60.	Rungru	*Kalnchoe spathulata*			Leaves
61.	Goma. Matapati	*Leucas cephalotes*		Flowers	Used in form of syrup for cough & cold.
62.	Barnasi	*Limonia crenulata*	Shrub	Leave/Root	Tonic, appetiser & useful in fever
63.	Jalapapili	*Lippia nudiflora Rich.*		Leaves	Alcoholic extract shows antibacterial activity.
64.	Aam	*Mangifera indica*	Tree	Fruit/ bark	Acrid, cooling, astringent to the bowels.
65.	Drek	*Melia azaderach*	Tree	Leaves/ Seeds	Anthelmintic, Used in rheumatism

66.	Jangli pudina	*Mentha longifolia Huds*	Shrub	Leaves	Carminative and stimulant
67.	Indian wild thyme	*Micromeria biflora Benth*	Shrub	Entire plant	Used as an application for worm infested wounds of cattle.
68.	Kambel, Rohni, Kamala	*Mallotus Philippinensis*	Tree	Bark. Fruit	Drug Kamela used for destroying tapeworms used externally in treatment of shin diseases.
69.	Maruabel	*Marsdenia tenacissima*	Shrub	Bark/ Juice	Bark yields a silky white fiber used for fishing lines, bow string by mountaineers, coagulated milky juice used as Indian rubber
70.	Sahjan	*Moringa pterigosperma*	Tree	Fruit/ Bark/ Leaves	Used in gout and acute rheumatism
71.	Ganghela	*Murraya koenigii*	Shrub	Leaves	Used for flavor to curries
72.	Kaiphal, Kaphal	*Myrica esculanta Buch-Ham*	Tree	Bark	Decoction used for asthma, diarrhea, lung affection, chronic bronchitis.
73.	Banwan	*Myrsine Africana*	Shrub	Fruit	Used as anthelmintic
74.	Kaner	*Nerium indicum Mill*	Shrub	Leave	Anthelmintic especially for tapeworm.
75.	Tamakhu	*Nicotiana tabacum*	Shrub	Leave	
76.	Harsinga	*Nyctanthes arbor-tristis*	Tree	Leave/ Flowers	Leaves are used for polishing wood, in medicine as a febrifuge and flower used as orange dye.
77.	Sandan	*Ougenis oojeinensis*	Tree	Bark	Used as febrifuge and also as fish poison.
78.	Chil	*Pinus roxburghii*	Tree	Pine needles/ Oil	As liniment in rheumatic pains as stimulant, expectorant & in chronic bronchitis.
79.	Khajur/ Palm	*Phoenix sylvestris*	Tree	Fruit / Leaves	Fruits are edible . cooling , tonic, useful in diarrhea and urinary problems.
80.	Kakkar	*Pistacia integerrima*	Tree	Galls	Kakarsinghi used in native medicines
81.	Chicha, Chita	*Plumbago zeylanica linn*	Shrub	Roots	As an appetizer, used in skin diseases, diarrhea, piles, used as application in scabies and unhealthy ulcers.
82.	Raniphul	*Polugonum plebejum R.Br*	Shrub	Entire plant	For bowel complaints and in pneumonia
83.	Bhekhal. Bekkra	*Prinscepia utilis*	Shrub	Entire plant	Yield oil used as a rubefacient & in rheumatism
84.	Siali, Sural	*Pueraria tuberosa*	Shrub	Flowers Roots	Cooling , aphrodisiac, Demulcent & rheumatism
85.	Anardana	*Punica*	Tree	Fruit	Used in diarrhea and dysentery

		granatum			
86.	Rara	*Randia dumetorum*	Tree	Fruit	Fruit are edible & pulp of fruit is also given in dysentery
87.	Chandra-bhaga	*Rauvolfia serpentine*	Shrub	Entire plant	Used as anti-hypertensive & as sedative. Also employed for relief of various central nervous system disorders, for intestinal disorder
88.	Basabthi	*Reinwardtia indica*	Shrub	Stempa & Leaves	Applied to wounds infected with maggots, used for treatment of paralysis.
89.	Brass	*Rhododendron arboretum*	Tree	Flower	Flowers used for making drinks & jams also used in diarrhea & in preparation of snuff. Tender leaves are edible & applied on forehead, wood used for making tool handles.
90.	Arandi	*Ricinus communis*	Shrub	Seeds	Made into paste & are applied on sores, bils7 rheumatic swelling.
91.	Locus tree, Robinia	*Robinia pseudoacacia*	Tree	Leaves & Flowers	Antispasmodic, laxative & emollient
92.	Kunjo, Kuja	*Rosa moschata*	Shrub		
93.	Guma	*Roylea elegans well*	Shrub	Roots & Leaves	Used as febrifuge
94.	Majith, Satavar	*Rubia cordifolia linn*	Climber	Entire plant	Used in rheumatism & several Ayurvedic preparations
95.	Jangali palak	*Rumex nepalensis*	Shrub	Roots	Purgative , also used for venereal diseases.
96.	Gurgumma	*Salvia moorcroftiana*		Roots/ Seeds/ Leaves	Used in cough As emetic, For guinea-worm and itching
97.	Ritha	*Saptndus mukorossi*	Tree	Fruit	Used in salivation, epilepsy, chlorosis.
98.	Sahdevi	*Sida rhombifolia*	Shrub	Roots & Leaves	Aphrodisiac, tonic useful in fever, heart diseases, burning sensation, piles.
99.	Barikatai	*Solanum indicum*	Shrub	Roots	For Treating cough, catarrhal affection, colic & nasal ulcers
100.	Kateli	*Solanum Khasianum Clarke*		Berries	Steroidal drugs
101.	Makoi	*S.nigrum*	Climber	Entire plant	In treating cirrhosis of liver & for patients suffering from dropsy
102.	Jangali gainda	*Targets minuta*	Shrub	Flowers	Flowers source of essential oil which shows hypotensive, spasmolytic and anti-inflammatory properties. Also as stomachic, diuretic & diaphoretic.
103.	Dulal	*Taraxacum officinalis weber*	Climber	Entire plant	Used as diuretic, stomachic , hepatic stimulant & tonic
104.	Sarpokha	*Tephrosia*		Roots	Alexipharmac good for ulcers and

		purpurea(l) pers			wounds, useful in enlargement of the spleen
105.	Arjun	*Terminalia arjuna*	Tree	Bark	Cooling, Alexiteric, styptic, tonic, antidysenteric, diseases of heart, anemia, excessive , perspiration, asthma.
106.	Bahera	*Terminalia belerica*	Tree	Bark	Mild diuretic , useful in anaemia & leucoderma
107.	Harad	*T. Chebula*	Tree	Fruit	Astringent, useful in dysentery & diarrhea, good in ophthalmia, disease of the spleen, piles. Cold in the head.
108.	Andhahuli	*Trichrodesma indicum linn*		Entire plant	Beneficial in diseases of eyes. It helps in the expulsion of the dead foetus.
109.	Common Nettle	*Urtica dioica*		Roots	Diuretic
110.	Gidartamaku	*Verbascum Thapsus linn*		Entire plant	Demulcent, astringent & pectoral. Used in pulmonary diseases
111.	Sododi, Sadori	*Vernonia cinerea less*		Entire plant	Tonic, stomachic, astringent. Cures asthma , bronchitis.
112.	Banafsha	*V. Serpens*	Herb	Roots	Purgative, good febrifuge, tonic, expectorant, diuretic, removes inflammation.
113.	Ban, Banda	*Viscum album*		Berry	Laxative, tonic, aphrodisiac , diuretic, cardio-tonic, used in inflammations
114.	Nirgundi, Bana, Sahalu	*Vitex negundo*	Shrub	Leaves	Considered tonic, smoked for headaches and applied to rheumatic swelling of joints
115.	Akri, Ashwagandha	*Withania somnifera(L) Dunal*		Fruits	Used for liver complaints, asthma & biliousness.
116.	Dawi, Dhai	*Woodfordia fruticosa Kurz*	Shrub	Flowers	Used in dysentery , astringents tonic & in disorders of the mucous membrane.
117.	Banokara	*Xanthium stramonium linn*	Shrub	Fruits	Rich is vitamin C used against chronic malaria and urinary troubles.
118.	Tejphal. Tirmira	*Zanthoxylum armatum DC*	Shrub	Bark fruit & seed fruits	Carminative, stomachic & anthelmintic.
119.	Jhaeber, Jhaeberi	*Z.nummularia (burn.f.) wt & A rn*		Fruits	Appetizer , stomachic
120.	Ber	*Zizyphus mauritiana*	Shrub	Leaves/. Fruit	Laxative, given in throat trouble. source of vitamin 'C' & Sugars

10.3 Three Year Rotation Cycle For Collection Of Herbs:

Years for the collection of herbs	2012-13 2015-16 2018-19 2021-22 2024-25	2013-14 2016-17 2019-20 2022-23 2025-26	2014-15 2017-18 2020-21 2023-24 2026-27
Name Of Blocks	Sadar, Jhandutta, Kalol, Swarghat, Bharari, Ghumarwin and Swahan.	Panjgain, Samoh, Malhot, Harlog, Nihari and Rattanpur.	Mohra, Paniyala, Bhakra, Bassi, Bachrettu, Gochar and Brahampukhar

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CHAPTER- XI

THE FOREST PROTECTION (OVERLAPPING) WORKING CIRCLE

11.1 General:- Forest fires are one of the greatest natural destroyers of our forests. The fires both accidental and incendiary are very common in this tract due to very hot and dry summers and dense population in the vicinity of the forests. Not only considerable forest area gets burnt every year causing enormous damage immune from fires. Mixed deciduous and scrub forests adversely affected. Oak forests are generally immune from fires. Mixed deciduous and scrub forests are also not prone to fire. It is the Chil forests that constitute the real danger zone from the view point of forest fires. Forest fires upset the prescription and time schedule of various operations in the management of these forests as has happened in the past. All efforts should be made to protect forests from fires for the effective implementation of the prescriptions of this Working Plan.

11.2 Causes of Forest Fires:- The cause of forest fires can be either of the following:

i. Natural:- This is caused due to lightning, friction between quartzite stones and dry bamboo culms. Such fires are rare.

ii. Accidental:- This type of fire is more common and caused due to negligence by way of throwing burning cigarattes/Bidi butts, leaving the burning fire behind by the hunters, wood collectors, graziers, honey collectors, etc. in the forest. The other causes of this type of fire are attributed to coal driven railway engines, uncontrolled/ill supervised control over debris burning and also burning of thorns in agricultural fields and pastures.

iii. Incendiarism:- The general motives behind this type of fires are (a) Green and ignorance of the local people and belief that burning of forest ground produces copious and good grass, (b) Concealing and covering of the misdeeds, like illicit fellings, illicit fellings, illicit resin tapping of trees etc. (c) For the extension of encroachments by the land grabbers and (d) facilitate killings of animals by the poachers etc.

11.2.1 A critical analysis of 213 incidences of fires in which and area of about 1699.60 ha. was burnt in the last 18 years i.e. from 1994-95 to2011-12 the causes of the fires can be classified as under:

Table 11.2

LIST OF FORESTS BURNT IN BILASPUR FOREST DIVISION

Year	Name of range	Name of forest	Area in hac	Cause of fire
1976-77	Ghumarwin	C13a Badhaghat	0.20	These fires are due to negligence of people passing through forests, accidentally, lightening due to thundering and by mischief
		C4c Maryani	0.81	
1977-78	Sadar	DPF Jamthal	2	
1978-79	Sadar	C1 Swarghat	2	
		C 6b Kulah	6	
		C8 Baner	35	
	Ghumarwin	C8a Mundkhar	10	
		C2a Kamloti	45	
1979-80	Ghumarwin	UF Maryani	2	
		C4 Bhiyoo	4	
		C8b Mundkhar	34	
		C5a Tiamloo	20	
		C4a Maryani	1.62	
		C4b Maryani	14	
		C10 Nihari	13	
1980-81	Ghumarwin	C5b Kulehri	5	
		UPF Juah	16	
	Naina Devi	C1 Palsed	0.5	
		C2 Bhakra	1	
	Jhandutta	UPF Jhabola	1	

		UF Kharli	1	
		UF Daroh	0.16	
		UF Sohar	0.32	
	Sadar	UF Karot	25	
		UF Niharkhan	0.24	
		C1a Jamthal	4	
		DPF Dindru	1.20	
		UF Swahan Toba	1.60	
		UF Makri	2	
		C9 Mundkhar	2	
		UF Kathla	4	
		C2 Dali	25	
		DPF Chamyon	40	
		UF Sangan	60	
		UF Dhar Tatoh	50	
		UF Tatoh	6	
		UF Thoudu	40	
		`UF Bhati ka Gahra	15	
		UF Oel	10	
		UF Seola	12	
		UF Luharda	5	
1981-82	Sadar	C1 Swarghat	5	
	Naina Devi	C6 Malloun	4.80	
1982-83	Ghumarwin	C6a Chandoh	12	
		C6b Chandoh	12	
		UF Jaswani	1	
1983-84	Jhandutta	C2b Kuthera	25	
1984-85	Ghumarwin	C1 Osal	6	
		UF Haritlyanger	6	
		C4c Maryani	0.04	

		C4a Maryani	1	
		C4g Maryani	17	
		C5b Tiamloo	29.60	
		UF Kamloti	4	
		C3b Chokhna	30	
		C4a Maryani	29	
		C6b Chandoh	3	
		UF Jangla	2	
		C3b Chokhna	5.60	
		C3e Chokhna	2	
		C4 Bhajoon	15	
		C5a Tiamloo	32.4	
		C5c Dadnal	28.40	
		C5d Paniyala	13.6	
		C5e Tiamloo	8.5	
		C4Ghann	2	
		UF Poli	0.30	
		C6a Chandoh	8	
		C6b Chandoh	2	
		C13a Badhaghat	1.5	
		C1a Plasla	3.5	
		C8a Mundkhar	7.6	
		C8b Mundkhar	39.6	
		C8e Mundkhar	19.2	
		C9a Sahib Kund	35.10	
		C9b Sahib Kund	20.50	
		UF Jaswani	1.60	
		C10 Nihari	1.2	
		UF Maryani	1	
		C13a Badhaghat	2	

1984-85	Sadar	UF Bhuwai	10	
		UF Kathla	14	
		C9 Mundkhar	18	
		C8 Baner	32	
		C10b Sangan	8	
		C10g Sangan	2.84	
		C2 Chamyon	20	
		UF Seola	3	
		UF Sayer Toba	10	
		UF Bandla	13	
		UF Bandla	10	
		UF Bhatti ka Gahra	10	
		UF Dhamna	30	
		UF Badsour	8	
		UF Bandla	10	
		UF Bandla	10	
		UF Bhatti ka Gahra	10	
		UF Dhamna	8	
1984-85	Naina Devi	UF Lehri	180	
	Jhandutta	C9 a Chalelhi	0.5	
		UF Prahu	0.25	
		C1 Wansa	12	
		C9b Chalelhi	2.05	
		UF Jhareri	12	
		C9b Chalelhi	8	
		C1b Kallar	15	
		C1c Kallar	40	
		C2a Kuthera	34	
		C3a Ghandir	20	
		C3b Ghandir	32	

		UF Ghandir	5	
		C4a Kathiun	34	
		C4b Kathiun	11	
		C4c Kathiun	5	
		C5a Kathiun	41.60	
		UF Ghandir	12	
		C4d Kathiun	35	
		C5b Kathiun	7	
		C28 Sanira	12	
		UF Talai	1	
		C8c Chalelhi	0.25	
		C9a Chalelhi	1.5	
		C8b Chalelhi	5	
		C6a Gujrera	23.20	
		C6b Gujrera	24	
		C8a Chalelhi	24	
		UF Jhabola	30	
1986-87	Swarghat	UFCharan	0.5	
		UF Tunnu	1	
		UF Ladhera	0.16	
		C6 Dhar Kanshi	2	
		UF Kutehla	1	
		UF Saikli	0.10	
1987-88	Bharari	C2a Kamloti	10	
		C5a Tiamloo	20	
		C4a Maryani	2	
		C4b Maryani	10	
		C6a Chandoh	11	
1988-89	Kalol	DPF Chugan	12	
		DPF Wansa	15	

	Ghumarwin	C4 Bhiyaoo	11	
		C3 Paniyala	7	
		Tiun, Maswar, C4 Bhiyoo, Rahat, Kamloti, Patta, Chandoh, Manglot, Maryani, Jaroda, Sahib-kund and Doon	296.40	
	Jhandutta	C6b Gujrera	6	
		UF Rohal	0.02	
		UF Rohal	0.08	
1989-90	Ghumarwin	DPF Bhiyoo	11	
		Paniyala	7	
		C6b Gujrera	6	
		C6b Gujrera	5	
1990-91	Jhandutta	C4a Kathiun	1	
		C5a Kathiun	2	
1991-92	Jhandutta	C8a Chalelhi	22	
		C9a Chalelhi	2	
		C9b Chalelhi	15.6	
		C6a Gujrera	18	
		C6b Gujrera	10	
		UF Jhabola	7	
		UF Gujrera	3	
		UF Balhseena	1	
		UF Gehra	5	
		UF Seu- Talai	0.5	
		UF Balhseena	3	
		C2 Kolka	0.75	
		C2 Jangla	0.25	
		C6b Gujrera	6	

	Swarghat	UF Chalelhi	8	
		DPF Kachouli	14	
	Bharari	C2a Manglot	5	
		C13a Badhaghat	3	
		C4a Maryani	4	
		C4b Maryani	15	
		UF Barog	4	
		C15 Doon	20.80	
		C2a Kamloti	60.40	
		C2b Kamloti	50	
		UF Baloh	6	
		UF Junala	2	
		C8a Mundkhar	7.6	
		C8b Mundkhar	35	
		C8c Mundkhar	18	
		C9a Sahib Kund	35	
		C9b Sahib Kund	20	
		C10 Nihari	20	
	Ghumarwin	DPF Rahat	40	
		C2 Tiun	30	
	Sadar	DPF Bryans	73	
1992-93	Swarghat	UF Kathla	30	
		UF Panga	10	
		UF Majher	5	
		C6b Kulah	25	
	Jhandutta	C5a Kathiun	20	
		C5b Kathiun	20	
		UF Jhamrarian	4	
		C4a Kathiun	15	
		C4b Kathiun	35.6	

		C4d Kathiun	35.20	
		UF Kathiun	0.5	
		C4d Kathiun	10	
		UF Ghandir	5	
	Ghumarwin	C4 Bhiyao	77	
		UF Randoh	9	
		C3 Paniyala	8	
1993-94	Swarghat	C3 Kutehla	4.5	
	Kalol	UF Kuthern	3	
	Jhandutta	UF Bakain	0.5	
		C8c Chalelhi	0.5	
		C 9a Chalelhi	10	
		C9b Chalelhi	2	
		C7 Dholikhala	12	
	Ghumarwin	UF Panol	8	
	Bharari	C5 a Tiamloo	20	
1994-95	Jhandutta	C1b Kallar	20	
		C1c Kallar	50	
		UF Behran	8	
		UF Talai	8	
		C7 Dholikhala	1	
		UF Balhseena	2	
	Kalol	C1 Wansa	20	
		Dohak Badgaon	2	
		UF Kharian	2	
		DPF Kharian	6	
	Jhandutta	UF Jhabola	16	
	Sadar	UF Prohi	20	
		UF Chalelhi	30	

	Swarghat	UF Tunu	15	
		UF Kachouli	15	
		Sai Kanatian	5	
	Jhandutta	C1b Prahoo	40	
		C2 Kolka	46.80	
		UF Balghar	5	
		UF Prahoo	8.2	
		C6a Jhoulla	5.6	
		C6b Jhoulla	30	
		C6c Jhoulla	70	
		C7a Jhoulla	10.40	
		C5 Bagra	3	
		DPF Dahad	30	
	Sadar	UF Swan Toba	6	
		UF Dookli	7	
		UF Bandla	7	
	Swarghat	UF Swarghat	5	
		C6 Kulah	40	
		UF Sunun	50	
		C4 Kiarian	12	
		UF Dhanswai	11	
		C3 Kutehla	5	
		C5 Jhal	48	
		C4 Jhal	39	
		C6a Dharkanshi	100	
		UF Dharkanshi	20	
		DPF Kakroa	30	
		UF Sai	15	
		UF Kachouli	8	
		C9 Mundkhar	5	

		UF Dhar-Bartha	10	
1995-96	Jhandutta	UF Gujrehra	1.5	
		C6b Gujrera	13	
		C1a Prahoo	4.8	
	Ghumarwin	C5b Kulehri	4	
		C1Osal jaman	10	
		DPF panol	3	
		C17 Sadiar	15	
	Bharari	C4c Maryani	10	
		C6a Chandoh	3	
		C6b Chandoh	3	
	Jhandutta	UF Dhararsani	8	
		UF Samleta	2	
		UF Jawah	23	
		DPF Jawah	9	
	Swarghat	UF Maithi	10	
	Sadar	UF Bandla	12	
		UF Markand	4	
	Ghumarwin	DPF Raili Nihan	4	
		C16a Rahat	10	
		C16b Rahat	10	
		UF Bhager	2	
	Kalol	C39 Kojar sara pani	10	
		C40 Johar Sundri	1	
	Jhandutta	C7a Dholi Khala	7	
		DPF Dholi Khala	1.5	
		C6a Jhoulla	7.6	
		C6b Jhoulla	29	
		C6c Jhoulla	68	
		C7b Jhoulla	4	

		UF Nand	8	
		C5 Mandikhar	4	
		C6a Sidh Phat	20	
		C1a Kallar	22	
		C1b Kallar	44.4	
		C1c kallar	50.4	
		C2a Kuthera	34	
		C2b Kuthera	50	
		C3a Ghandir	28	
		C3b Ghandir	35.6	
		UF Kallar	6	
		C5a Kathiun	40	
		C4a Kathiun	30	
		UF Jhamrarian	2	
		UF Kothi	5	
		UF Dagsech	2	
	Bharari	C4c Maryani	40	
		C4b Maryani	10	
		C4a Maryani	30	
		C3b Chokhna	30	
		C6a Chandoh	8	
		C6a Chandoh	13	
		C6b Chandoh	11	
		C8a Mundkhar	7.6	
		C8b Mundkhar	40	
		C8c Mundkhar	19.2	
		C10 Nihari	20	
		C4b Maryani	7	
		C5a Tiamloo	12	
	Swarghat	UF UF Kathla	93	

	Jhandutta	UF Dol	2	
		UF Baloh	4	
		UF Baroha	30	
		UF Amroha	12	
	Sadar	UF Dhartatoh	4	
		UF Malokhar	5	
		UF Sangan	36	
		UF Rajpura	36	
		UF Seola	15	
		UF Bhatti ka gahra	5	
		UF Bandla	10	
1996-97	Ghumarwin	C5a Bardin	5	
		C4 Bhiyoo	5	
	Jhandutta	C5a Kathiun	2.75	
1997-98	Swarghat	UF Dhar Bhartha	2	
	Jhandutta	C2 Jangla	3	
	Swarghat	UF Challi	3	
1998-99	Ghumarwin	C2 Dhingoo	4.5	
	Sadar	UF Rajp[ura	4	
	Ghumarwin	DPF Panol	15	
	Sadar	DPF Rajpura	59	
		Uf Seola	6	
		UF Luharda	4	
	Swarghat	UF Chharol	1	
	Ghumarwin	C1 Osal Jaman	18	
		C2 Dhingoo	8	
		DPF Bhager	3	
	Sadar	UF Oel	1.5	
	Jhandutta	C-7 Dholi khala	10	
		C-4 Kathiun	2.5	

		C.5 Kathiun	10	
	Ghumarwin	C-17 Sadyar	11	
1999-2000	Sadar	UF Sair	6	
		UF Bandla	5	
		UF Parnali	2	
		Kasal	9	
		UF Parnali	5	
		Dhamna	5	
	Ghumarwin	DPF Sadiar	5	
		UF Sai Brahamna	7	
	Swarghat	C1 Swarghat	7	
	Sadar	UF Doba	4	
		UF Jabli	5	
		UF Sihra	4	
	Swarghat	UF Behal	3	
		UF Kachouli	7	
	Jhandutta	DPF Chalelhi	16	
		C9 jamothi	6	
		UF Nallian	4	
		C4a Kathiun	11	
		UF Amroa	5	
	Kalol	UF Bharoli Kalan	5	
	Sadar	UF Jamthal	39	
	Swarghat	Chharol	18	
		UF Tunnu	6	
	Jhandutta	C6a Sidh Phat	54.4	
		C4a Suhar phat	17	
	Swarghat	UF Bassi	48	
	Ghumarwin	C16 Rahat	9	

		UF Tantha	12	
	Kalol	UF Silwin	10	
	Swarghat	UF Jamli	10	
	Sadar	UF Kahvi Sihra	8	
		RF Bahadurpur	13	
	Kalol	UF Chaknar	5	
		Balh-Chlog	5	
	Swarghat	UF Gharwasra & Bhuawi	496	
	Ghumarwin	C2 Dhingoo	7	
	Kalol	UF Marottan, Bagfal, Dhaner`	15	
	Jhandutta	C4a & b Suhar phat	3	
	Sadar	UF Rajpura, DPF Bhadroun, UF Bharari	36	
	Swarghat	UF, Palti, Tarsooh, Dehan	178	
	Jhandutta	C5 Mandikhar, Sidh phat, suharphat	41	
	Kalol	C6 Marottan, UF Kakriar, Dholagchaknar, C2 tihri	29	
		C35 Tangwal, DPF Dholag , Malraon, Bharoli Kalan	45	
		UF jharari & DPF Sanihra	20	
	Jhandutta	C1b Prahoo, C3b Balh-Chalog, UF Thuran & C3 Ghagas	117	
	Bharari	C2b Kamloti, C3 Chokhna	54	
	Kalol	DPF Bharoli Khurad	5	
	Ghumarwin	C4 Bhiyoo	8	
	Sadar	UF Chehar, Sihra, Sungal, soldha & Oel	47	

2000-01	Ghumarwin	C4 Ghan & C3 Dhingoo	3	
2001-02	Sadar	DPF Baryans	10	
		DPF Chalehli & Niharkand Basla & Bandla	25	
	Bharari	C11b Padyalag	2.5	
2002-03	Sadar	UF Sai Farda, Manwan	5	
	Ghumarwin	C2 Dhingoo	6	
	Bharari	C4c Maryani, c5a Tiamloo, C1b Plasla, C2a Kamloti, C1a Plasla,	69.19	
	Kalol	UF Sooh, C3 Baghfal	10.5	
	Swarghat	UF Kathla	4	
	Ghumarwin	C8 Fetidhar	10	
	Jhandutta	UF Behran, Amroha, Prahoo, Ner, C2 Jangla & C1 Seru Salasi	11	
	Swarghat	C8 Baner & C1 Swarghat	4	
	Ghumarwin	C1 Osal jaman	2	
	Bharari	C4 maryani, UF Junala, UF Paniala,DPF Paniala, c1b Plasla & C12 Sohni Devi	26	
	Jhandutta	C8 a Chalelhi & C4b Kathiun	9	
	Swarghat	UF Rod Jamun	22	
	Sadar	UF Bagi, Sihra, Sangan, DPF Chamyon & UF Dhar Tatoh	65	
	Bharari	C4a & b Maryani, & C2a Kamloti	49	
	Ghumarwin	C4 Bhiyoo	24	
	Kalol	C9 Chalawa	9	

	Sadar	DPF Kasol	5	
2003-04	Swarghat	UF Tunnu, Cheli, Methi & Saikli	21	
	Sadar	UF Rajpura, Parnali, Seola, Chalelhi, Rajghati, Dagsech	66.5	
	Swarghat	UF Kurgal & Dhanswai	8	
	Sadar	DPF Binoula, UF Sihra	12	
	Jhandutta	DPF Jawah	3	
	Swarghat	UF Sasota	5	
	Ghumarwin	UF Balhu Kharyala	6	
	Bharari	C5a & b Tiamloo, C5c Dadhol & C4C Maryani	70.5	
	Sadar	UF Luharda, bhajoon & Sumari	77	
	Jhandutta	C4c Kathiun, DPF Ghandir	30	
		C4b, C5a, b Kathiun, DPF Jhamriarian	77	
	Swarghat	C3 Kuthela, UF Thunj	2.5	
	Jhandutta	C3 Ghagas, Neras, C7 Bagra & C1 Seru Salasi	54	
	Bharari	DPF Karloti & Makra	8	
	Ghumarwin	C16a Rahat	30	
	Bharari	C15 Doon	14	
	Ghumarwin	C4 Ghaan	6	
	Swarghat	UF thunj, Jhal & DPF Kutehla	8.5	
	Bharari	C14a & b Kallar, C12a & B Sohni Devi & C13a Badhaghat	50.8	
	Ghumarwin	C8 Fetidhar	12	

	Sadar	DPF Sagan	18	
	Bharari	C2a Kamloti	20	
		C2b Kamloti, C3b&c Chokhana & C7 Andrla phat	76.5	
	Swarghat	UF Bhuwai, dharkanshi, Chehri & Changar Tarsooh	7.5	
	Kalol	C1 Wansa, UF Naghiar	9	
	Swarghat	UF Saikanaitan	2	
	Bharari	C13a Badhaghat	15.4	
	Jhandutta	C9 Jamothi	25	
	Ghumarwin	C2 Tiun	2	
	Swarghat	UF Balh kanaitan		
2004-05	Sadar	UF Kothipura, DPF Parnali, UF Nouni	60	
	Swarghat	UF Kathla & Mundkhar	20	
	Sadar	DPF Dhar Tatoh	20	
	Ghumarwin	C2 Dhangoo, C8 Fetidhar & C3a Paniala	10	
	Sadar	UF Dhar Tatoh & C2c Chamyon	23	
	Swarghat	UF Baner, Jandour	2.5	
	Bharari	C5a Tiamloo, C4a,b,c Maryani, DPF Patta, C3a & c Chokhna	49	
		C2a Kamloti, C3c Chokhna	69.10	
	Ghumarwin	C17 Sadiar	15	
	Swarghat	DPF Satgarh	1	
	Kalol	C9 Chalwa	20	
	Swarghat	UF Chilla & Dharbachingal	11	
	Ghumarwin	C6a Masour	20	

	Jhandutta	C8c Chalelhi	16.2	
	Swarghat	C3 Kachouli	3	
	Ghumarwin	Osal jamun	4	
	Sadar	UF Jamli	1	
	Bharari	C6b Chandoh	10	
	Jhandutta	C6 Sidhphat	12	
2005-06	Bharari	C5a & b Tiamloo	10.5	
		C2a Kamloti	40	
		C3a Chokhna	2	
	Ghumarwin	DPF Panol	5	
	Jhandutta	DPF Thuran & Nihan	15	
	Bharari	C1a Plasla	5	
	Swarghat	UF Dhanswai	5	
	Ghumarwin	DPF Barota	4	
	Swarghat	UF Kulah & C2 Swarghat	9	
	Kalol	UF Seri	10	
	Ghumarwin	Balhu Kharyala	1	
	Bharari	DPF Makra, Muchhwan & Karloti	6	
	Ghumarwin	DPF Bardi & C5a Palti	11	
	Jhandutta	C4a Suharphat, C5b Mundkhar & C6a & B Sidhphat	60	
2006-07	Kalol	C29 Kothi	20	
	Bharari	C2b Kamloti	25	
2007-08		DPF Karloti	4.5	
	Kalol	C6 Amrottan	20	
	Ghumarwin	C2 Dhangoo	1	
	Bharari	C10 Nihari & C8b Mundkhar	13	
	Sadar	DPF Binoula	10	

	Bharari	C2a & b Kamloti	16	
	Jhandutta	UF Talai	4	
	Bharari	C3a Chokhna & C2b Kamloti	9.5	
2008-09	Sadar	DPF Baryans	8	
	Jhandutta	DFP Dafer	10.5	
	Bharari	C4 Sahib kund	11.5	
	Sadar	UF Badsour & DPF Bandla	20	
	Swarghat	UF Baner	3	
	Jhandutta	C1Seru Salasi & C2 Jangla	70	
	Sadar	Swana Toba	5	
	Swarghat	UF Dhar Bhartha, Nalla	20	
	Sadar	UF Sumari, Luharda	10	
	Ghumarwin	DPF Rohin	5	
	Sadar	DPF Dhar Tatoh,	47	
	Ghumarwin	C3 Paniyala	7	
	Kalol	UF Jaddu	5	
	Sadar	UF mangrot, Dagsech & Niharkand Basla	6.5	
		DPF Chamyon	20	
	Bharari	C1a Plasla	5	
	Ghumarwin	C3a paniala	4	
	Bharari	C15 Doon	2.5	
2009-10	Sadar	DPF Kasal, Chalelhi & Prohi	25	
	Jhandutta	*DPF Kallar, C9b Chalelhi &* DPF Talai	*41.5*	
	Swarghat	GG Patti	20	
	Sadar	UF Sihra &-Dhamna	24	
	Jhandutta	C9 Chelehli	2	
	Sadar	DPF Bryans	40	

	Jhandutta	DPF Thuran	2	
		C4 Suharphat	2	
	Sadar	UF Sihra	1.5	
	Bharari	C5b Tiamloo	3	
	Sadar	UF Dhar	8	
		UF Dunglu	3	
	Jhandutta	DPF Balhseena	4	
	Ghumarwin	C2 Dhingoo	17	
	Sadar	DPF Sangan & UF Dhar Tatoh	20	
	Jhandutta	UF Dholi Khala	9	
	Swarghat	UF Dhara	8	
	Jhandutta	C4c Kathiun	9	
	Kalol	UF Kakriar	3	
	Bharari	DPF Karloti & Makra	3	
	Sadar	DPF Parnali & UF Nouni	10	
	Bharari	C10 Nihari, C8a Mundkhar	45	
	Jhandutta	C1b Prahoo	8	
	Sadar	UF Seola	10	
2010-11	Jhandutta	C9a & b Chalehli	8	
	Swarghat	UF Bansa	5	
	Ghumarwin	C4a Bhiyoo	12	
	Sadar	UF chamyon	48	
	Swarghat	UF charol & DPF Kachouli	20	
	Kalol	UF Kakrair	55	
	Jhandutta	DPF Jhabola, C11 Gochar & C4d Goacher	179	
	Sadar	UF Prohi, DPF Kasal, Bharthu, Sangirthi & Chalelhi	38	

	Jhandutta	C8c Chalelhi	10	
	Sadar	RF Bahadurpur	6	
		UF Dabar	2	
	Ghumarwin	C5b Kulehri	5	
	Jhandutta	C1b Kallar	5	
	Swarghat	C2 Rattanpur & Swarghat	2.8	
	Jhandutta	C4a Khujral & DPF Talai	5	
	Sadar	UF dhartatoh	10	
	Bharari	UF Junala	2	
	Jhandutta	Prahoo, C2a Kuthera & C.1 Kallar	13	
2011-12	Sadar	UF Parohi	2	
	Swarghat	C8 Baner	5	
	Kalol	UF durghat	3.5.	
	Sadar	UF Sui	1	
	Jhandutta	UF Thuran	3	
	Sadar	Kot	4	
	Ghumarwin	C7b Kulehri	4	
		Total: 1994-95 to 2011-12	1699.6	

11.2.2 From the above it is clear that the main cause of fires in this Division is attributable to mischief by people who set the forest on fire under the misguided notion of getting good grass and fuel wood. The other important cause is negligent smoking by people particularly along the roads and paths passing through the forests.

11.3 Fire Season:- The greatest danger of fire occurrence is during summer months from April to early July, up to the commencement of Monsoon rains. During autumn normally the danger of forest fires is less but occasionally the fires do occur in this period also.

11.4 Fire Protection Measures:- The following protection measures are considered absolutely necessary to protect forest from fires.

11.4.1 Meeting Right Holder's Requirements:- The forests can not be protected against fires without winning the good will and co-operation of the local people. The reasonable demands of right holders for timber, fuelwood, fodder and grazing etc shall have to be met with in order to make them fully satisfied so that they do not indulge in mischievous act of setting fires.

11.4.2 Education and Publicity:- A full scale awareness compaign should be launched by erecting sign-board and posters, issuing advertisements, organizing exhibits and devices of all sorts, circulating printed material, use of audio visual aids for spreading the awareness among the local people about the harmful effects of fire and friendly role of forests. The people should also be educated of fire prevention methods through training individuals and group contacts and launching of special programme like Fire Protection Week on the lines of Wild Life Week. Prizes should be given to those panchayat samiti in whose area damage due to fire is least or minimum. Winners of debates, essay competitions should also be suitable awarded.

11.4.3 Fire Lines:- Though sufficient number of fire lines exist in the Division (these are listed in table 8.2) but most of these are in neglected stage. Extensive net work of roads and paths throughout the division and passing through the forests also act as fire lines or barriers. As such no more fire lines are needed. These fire lines need to be kept cleared of vegetation, pine needles and other inflammable material during the fire season. The fire lines as well as the edges of the roads and paths should be cleared and burnt every year just before the fire season.

TABLE 11.2

S. No	Name of range	Name of fire lines	Length (in Km	Width (mtrs)	Compartment governed
1	Swarghat	Kacholi to Saikli	2	10	C2 Rattanpur, C3 Kacholi
2	Swarghat	Daobar to Khui	2.5	10	UF Darobaar and UF Khui (Part)
3	Swarghat	Khui to Maithi	2.5.	10	UF Maithi and Part of UF Khui
4	Swarghat	Ledhera to Charan	2.5	10	UF Baddu, Ledhara, chharan

5	Swarghat	Dhadhog to Nali Paloun	14	10	UF Dhadhog and Nali Ploun
6	Swarghat	Ledhara to Maithi	10	10	UF Ladhera (Part) and Maithi (Part)
7	Swarghat	Tramri to Lagghat	15	10	UF Lag Ghat & Tramri
8	Swarghat	Swarghat to Swarghat	3	10	C1 Swarghat
9	Swarghat	Swarghat to Kathla	4	10	UF Panga, Kathla, C9 Mundkhar
10	Swarghat	Kathla to Mundkhar	3	10	Part of C9 Mundkhar & UF Kathla
11	Swarghat	Fatehpur to C4 Jhal	4	10	C4 Jhal
12	Swarghat	Fatehpur to C5 Chab	2	10	C5 Chab
13	Swarghat	Fatehpur to C3 Kutehla	2	10	C3 Kutehla
14	Swarghat	Fatehpur to C8 Banner	2	10	C8 Banner
15	Swarghat	Fatehpur to C6a Dhar Kanshi	2.5	10	C6a Dhar Kanshi
16	Swarghat	Fatehpur to Kullah	2	10	C6b Kullah
17	Bharari	Kamloti to Chokhna	10	10	C2a & b Kamloti, C3a & b Chokhna
18	Bharari	Maryani to Chandoh	10	10	C4a,b,c Maryani,, C6a & b Chandoh
19	Bharari	Tiamloo to Maryani	10	10	Part of C4b Maryani and C5a &b Tiamloo
20	Bharari	Mundkhar to Sahib Kund	10	10	C8a & b Mundkhar, C9a & b Sahib kund
21	Jhandutta	Gochar to	16	20	C6a Gujrera , C9b & c Chalelhi,

		Jhabola & Talai			C8a, b, c Chalelhi and UF Jhabola
22	Jhandutta	Kallar to Ghandir, Gujrehra and Talai	29	10	C4a,b,c Kathiun, C6b Gujrehra, C5a Kathiun, C1b & c Kallar
23	Jhandutta	Kallar to Gochar, Jhabola	8	10	C2a, b Kuthera, C3a, b Ghandir
24	Jhandutta	Kallar to Kuthera	10	10	C3b Ghandir, C2d Kuthera
		Total	**176**		

11.4.4 Fire Protection Staff:- Sufficient number of fire watchers should be employed during the fire season to help the territorial staff to keep a watch on the fire season to help the territorial staff to keep a watch on the fire incidences. The number of fire watchers needed in a particular Range will be assessed by the D.F.O. in consultation with concerned R.O. Each fire watcher should be provided with sufficient fire fighting equipment such as, read rakes, shovels, mullocks, slashers, axes hatches garden forks, water bottles, gunny bags etc. The stock of fire fighting equipment should be kept ready at each Range head qauarter and also in blocks at a convenient place with easy access to meet any emergency. Individual fire watchers for each forest mentioned in para 8.4 shall be employed as these forests are the most vulnerable from the point of view of fire. Forest Guards and other staff should be on their beat through out the fire season and should patrol their beats extensively. Each Range should have a written plan of operation in case of an out break of fire and every member of the staff should be given definite instructions in this regard.

11.4.5 Control Burning in Regeneration Areas:- All Chil regeneration areas are isolated by clearing a strip 1 meter wide of all inflammable material, leaves, bushes etc to act as a fire barrier during the fire season. In areas where the saplings have attained a height of 2 to 3 meters, the grazing of cattle be permitted to reduce inflammable material. Early cleanings and thinning in young regeneration should be done to give an escapement of 1 meter. The area should be control burnt during winters and this operation must be

completed by February. An area should be control burnt at least twice before opening it for grazing. The decision of control burning of a regeneration area or a plantation is left at the discretion of the D.F.O. He should decide it after inspecting the forest / plantation area and assessing the condition of the crop. It is for the D.F.O. to see that the areas containing regeneration below 1.5 meters height is not control burnt.

11.4.6 Control Burning of Area not under Regeneration:- A programme for control buring of Chil forest is laid out in table 11.3. In the forest to be control burnt the fire should be started from the ridge and allowed to move down hill. During this operation sufficient men must be engaged to keep the fire under control at all times. Fire should be extinguished at night. In forests where resin tapping is being done it is essential that the base of trees with a radius of 1.5 meters should be kept clear of all freshening chips, resin pots at all times by the resin tappers. All such forests should be control burnt every 3 years.

	Swarghat	UF Bhater	-	-	3.14
	Swarghat	UF Kutehla	20.94	-	-
	Swarghat	UF Kakroa	4.32	-	-
	Swarghat	UF Nal	-	-	18.25
	Swarghat	UF Souta	-	-	42
	Swarghat	UF Nera Kund	-	-	34
	Swarghat	UF Cheota	-	-	12.09
	Swarghat	UF Tanbol	-	-	3.70
	Swarghat	UF Chelli	-	-	43.6
	Swarghat	UF Baner	71.20	-	-
	Swarghat	UF Dharkanshi	-	-	16.26
	Swarghat	UF Kulah	-	-	10.48
	Swarghat	UF Matnoh	-	-	74
	Swarghat	UF Dabeta	-	12	-
	Swarghat	UF Dhar Bindra	-	21	-
	Swarghat	UF Dhanswai	-	43	-
	Swarghat	UF Dhar Bartha	10	-	-
	Swarghat	UF Tikkar	-	-	47
		Total Swarghat block	**245.66**	**411.79**	**456.24**
	Swahan	UF Meoth-II	39.24	-	-
	Swahan	UF Dhar	34.40	-	-
	Swahan	UF Bag	13.6	-	-
	Swahan	UF Bohawai	67.58	-	-
	Swahan	UF Chamb- Bhjoon	-	24.86	-
	Swahan	UF Tiun	-	17.60	-
		Total Swahan Block	**154.82**	**42.46**	-
Swarghat	Rattanpur	C2 Rattanpur	25.20	-	-
	Rattanpur	C3 Kacholi	14.80	-	-

	Rattanpur	UF Jol	3.16	-	-
	Rattanpur	UF Talsari	41.31	-	-
	Rattanpur	UF Kacholi	59.06	-	-
	Rattanpur	UF Chilla	55.25	-	-
	Rattanpur	UF Baddu	24	--	-
	Rattanpur	UF Dadhog	32.73	-	-
	Rattanpur	UF Ladhera khurad	3.03	-	-
	Rattanpur	UF Lag	-	57.30	-
	Rattanpur	UF Palah	-	30	-
	Rattanpur	UF Ladhera kalan	-	6.61	-
	Rattanpur	UF Nali Palon	-	9.53	-
	Rattanpur	UF Jamli	-	10.97	-
	Rattanpur	UF Charan	-	12.70	-
	Rattanpur	UF Khuhi	-	14	-
	Rattanpur	UF Maithi	-	43.93	-
	Rattanpur	UF Saikli	-	-	62.11
	Rattanpur	UF Sai Kanaitan	-	-	76.93
	Rattanpur	UF Sai Brhamna	-	-	17.66
	Rattanpur	UF Souti	-	-	20.62
		Total Rattanpur block	**258.54**	**185.04**	**177.32**
	Total Swarghat range		**659.02**	**639.29**	**633.56**
Sadar	Brahampukhar	C2 Bahadurpur	-	-	30.80
	Brahampukhar	UF Rajghati	-	-	2.25
	Brahampukhar	DPF Bhandoh	-	-	2.09
	Brahampukhar	DPF Sumari – I	19.30	-	-
	Brahampukhar	DPF Sumari – II	1.42		
	Brahampukhar	DPF Majher-II	19.13	-	-
	Brahampukhar	UF Luharda-II	-	55.25	-
	Brahampukhar	UF Chaleli	-	34.34	-

	Brahampukhar	DPF Chaleli		3.56	
		Total Brahampukhar block	**39.85**	**93.15**	**35.14**
Sadar	Panjgain	C1a Jamthal	-	-	61.80
	Total Sadar Range		**39.85**	**93.15**	**96.94**
Bharari	Nihari	C2b Kamloti	67.20	-	-
	Nihari	C2d Dangar-II	2.14	-	-
	Nihari	C2e Haritlyangar-II	5.90	-	-
	Nihari	C3a Chokhna	50.8	-	-
	Nihari	C3b –do-	35.60	-	-
	Nihari	C3c-do-	24	-	-
	Nihari	C5g Chokhna	2.01	-	-
	Nihari	C5 h Panyali	-	3.02	-
	Nihari	C6a Chandoh	-	24.4	-
	Nihari	C6b –do-	-	14.80	-
	Nihari	C7 Andral phat	-	-	10.80
	Nihari	C8b Mundkhar	-	-	40
	Nihari	C8c –do-	-	-	19.2
	Nihari	C9a Sahib Kund	-	-	35.10
	Nihari	C10 Nihari	-	-	23.20
	Nihari	C11a Manglot	-	-	10
	Nihari	C11bPadyalag	-	-	6.40
	Nihari	DPF Jarora-I	-	3.51	-
	Nihari	DPF Chandoh	-	1.27	
	Nihari	DPF Dadhol Kalan-II	-	2.21	-
	Nihari	UF Jaswani	-	9.16	-
	Nihari	UF Dadhol Kalan-II	-	3.86	-
	Nihari	UF Tiamloo	-	18.0	-
	Nihari	UF Patta Malotar	-	19.24	-

		Total Nihari block	**187.65**	**99.47**	**144.70**
Bharari	Mohra	C12 Sohni Devi	-	-	18
	Mohra	C13a Badhaghat	-	-	28.40
	Mohra	C13b Bharon ka ser	-	-	4.80
	Mohra	C14 a Kalar	-	-	29.30
	Mohra	C14b –do-	-	-	9.50
	Mohra	C15a Doon	-	-	24.80
	Mohra	DPF Karloti-I	-	8.13	-
	Mohra	UF Daloh	-	3.97	-
	Mohra	DPF Sandyar	-	-	5.25
	Mohra	DPF Doon-IV	-	-	4.59
		Total Mohra block	**-**	**12.10**	**124.64**
	Total Bharari Range		**187.65**	**111.57**	**269.34**
Ghumarwin	Ghumarwin	C16a Rahat	-	-	12.40
	Ghumarwin	C16b –do-	-	-	20
	Ghumarwin	C16c –do-	-	-	18
	Ghumarwin	C17 Sadiar	-	-	18
	Ghumarwin	C1 a Osal Jamun	-	-	62.40
	Ghumarwin	C2 Dhingoo	-	-	30
	Ghumarwin	DPF Samoh-I	-	-	5.51
	Ghumarwin	UF Panol Balu	-	-	24.79
	Ghumarwin	UF Bag Panol	-	24	-
	Ghumarwin	UF Kularu	-	4.20	-
		Total Ghumarwin block	**-**	**28.20**	**191.10**
Ghumarwin	Harlog	C5a Palti	40.4	-	-
	Harlog	C5b Harlog	32.4	-	-
	Harlog	UF Saryoun	14.32	-	-
	Harlog	DPF Banglehra-I	2.91	-	-
	Harlog	DPF Banglehra-II	6.70	-	-

	Harlog	DPF Banglehra-III	2.32		
	Harlog	UF Banglehra-III	10.00	-	-
	Harlog	DPF Palti	11.45	-	-
	Harlog	UF Bardi	19.06	-	-
		Total Harlog block	**139.56**	-	-
Ghumarwin	Paniyala	C2 Tiun Khans	-	54	-
	Paniyala	C4a Bhiao	-	90.80	
	Paniyala	C4 b Randoh	-	14.72	-
	Paniyala	UF Gatol	-	28.22	-
		Total Mohra block	-	**187.74**	-
	Total Ghumarwin Range:		**139.56**	**215.94**	**191.10**
Jhandutta	Samoh	C3a Ghagas	-	34.80	-
	Samoh	C3d Nihan	-	10.99	-
	Samoh	C4a Suhar phat	-	24.50	-
	Samoh	C4b –do-	-	7.50	-
	Samoh	C5 Mundkhar	-	19.6	-
	Samoh	C6a Sidhphat	-	21.20	-
	Samoh	C6b-do-	-	19.20	-
	Samoh	C9 Jamothi	-	39.6	-
	Samoh	C12 Neras	-	3.74	-
	Samoh	C15a Hirapur	-	4.78	-
	Samoh	DPF Jangla-I	2.28	-	-
	Samoh	DPF Jangla-II	8.08	-	-
	Samoh	DPF Jangla-III	22.10	-	-
	Samoh	DPF Badol-II	5.67	-	-
	Samoh	DPF Bhadol-II	1.18		
	Samoh	DPF Salasi	7.20	-	-
	Samoh	DPF Thuran-I	6.49	-	-
	Samoh	DPF Thuran-II	7.69	-	-
	Samoh	DPF Thuran-III	9.06	-	-

	Samoh	DPF Dhanethar	5.28	-	-
	Samoh	UF Jamothi	-	4.20	-
	Samoh	UF Jawah-I	47.58	-	-
	Samoh	C1a Seru Salasi	83.6	-	-
	Samoh	C2 jangla	54.40	-	-
	Samoh	C5a Mulgani	10.8	-	-
		Total Samoh block	**271.41**	**190.11**	-
Jhandutta	Jhandutta	C1a Prahoo	-	4.80	-
	Jhandutta	C1b-do-	-	40	-
	Jhandutta	C3 Balhjole	-	36.4	-
	Jhandutta	C6a Jhaulla	-	7.50	-
	Jhandutta	C6b –do-	-	32.75	-
	Jhandutta	C6c-do-	-	73.75	-
	Jhandutta	C7a-do-	-	10.4	-
	Jhandutta	DPF Behran-II	-	19.82	-
	Jhandutta	DPF Amroa-II	-	8.37	-
	Jhandutta	DPF Rohal-I	-	6.75	-
	Jhandutta	DPF Rohal-II	-	13.30	-
	Jhandutta	DPF Nagroan	-	2.12	-
	Jhandutta	DPF Parahoo-II	-	5.35	-
		Total Samoh block	-	**261.31**	-
Jhandutta	Gochar	C1b Kallar	-	-	44.40
	Gochar	C2 Kolka	-	46.8	-
	Gochar	C1c Kallar	-	-	50.4
	Gochar	C2a Kuthera	-	-	34
	Gochar	C2b –do-	-	-	50
	Gochar	C3b Ghandir	-	-	35.6
	Gochar	C4a Kafhiun	-	-	34
	Gochar	C4b-do-	-	-	35.6
	Gochar	C4c-do-	-	-	29.2

	Gochar	C4d-do-	-	-	35.20
	Gochar	C5a –do-	-	-	41.6
	Gochar	C5b-do-	-	-	35.6
	Gochar	C5c-do-	-	-	1.94
	Gochar	C6a Gujrera	-	-	24
	Gochar	C6b –do-	-	-	23.20
	Gochar	C6c-do-	-	-	6.44
	Gochar	C7 Dholi khala	-	-	36.4
	Gochar	*C8a Chalelhi*	*26.80*	-	-
	Gochar	C8b-do-	26	-	-
	Gochar	C8c-do-	21.2	-	-
	Gochar	C9a Chalelhi	77.60	--	-
	Gochar	*C9b –do-*	*15.60*	-	-
	Gochar	C10 Jhabola	15.03	-	-
	Gochar	C12 Malari	-	-	14.12
	Gochar	DPF Jhabola-II	55.15	-	-
	Gochar	DPF Ghandir-III	-	-	17.78
	Gochar	DPF Ghandir-IV	-	-	18.46
	Gochar	DPF Ghandir-V	-	-	9.63
	Gochar	*DPF Ghandir-VI*	-	-	*7.46*
	Gochar	DPF Balshina-I	-	-	37.65
	Gochar	DPF Balshina -II	-	-	28.52
	Gochar	DPF Balshina -IV	-	-	3.17
	Gochar	DPF Malari-III	-	-	12.89
	Gochar	UF Kuthera	-	-	0.68
		Total Gochar block	**237.38**	**46.8**	**667.94**
	Total Jhandutta Range:		**508.79**	**498.22**	**667.94**
Kalol	Malhot	C1 Dhanoula	14.8	-	-
	Malhot	C2 Godam Dhanoula	9.20	-	-

	Malhot	C4 Kakrer	3.20	-	-
	Malhot	C5 Balyar	6	-	-
	Malhot	C6 Amrottan	49.2	-	-
	Malhot	C9 Chalawa	-	-	26
	Malhot	DPF Jejwin	6.47	-	-
	Malhot	DPF Silwin-I	16.28	-	-
	Malhot	DPF Silwin-II	16.18	-	-
	Malhot	UF Dhanar	10.67	-	-
	Malhot	UF Silwin	18.47		
		Total Malhot block	**150.47**	-	**26.0**
	Kalol	C13 Chaknar	-	11.6	-
	Kalol	C14 Dholag	-	4.80	-
	Kalol	C15 Jharari	-	5.6	-
	Kalol	C16 Kharian	-	6.40	-
	Kalol	C17 Chugan	-	18	-
	Kalol	C19 Kalol	-	3.60	-
	Kalol	C21 Khill	-	18.40	-
	Kalol	C30 Tihri Khas	-	8	-
	Kalol	DPF Tihri-II	-	5.04	-
		Total Kalol block	-	**81.44**	-
	Total Kalol Range:		**150.47**	**81.44**	**26.0**
TOTAL BILASPUR FOREST DIVISION			**1685.34**	**1639.61**	**1884.88**

11.4.7 Combating the Fire:- When a fire is observed, Forest Guard or the fire watcher should once inform the Range Forest Officer and the Block Officer (Deputy Ranger). He should also inform the president of local panchayat immediately as well as the staff of the Govt. officers or institutions situated in the vicinity and seek their help in the fire fighting operations. The senior officer present at site will immediately take command of the operations. The fire is normally controlled by beating with a broom of green bushes. In case the fire is uncontrollable and gets out of control, counter firing is resorted from a

definite line such as path, ridge or fire line. Such a counter fire line is formed by clearing the soil coverings and removal of bushes after which a fire is started in opposite direction so as to consume the fuel in advance of the incoming forest fire. Counter firing requires a high degree of skill, timing and co-ordination in its execution, if applied inaptly, it may prove disastrous because instead of controlling the fire it will help in its spreading. In such circumstances it will discourage and demoralize the staff. After the fire has been brought under control, the smouldering stumps should be extinguished by putting the dug earth on them and strict vigilance kept till all dangers of fire spreading are taken care of. Arrangement for the transport of food, water and adequate fire fighting tools are essential. The rolls of right holders who helped to fight the fire should be kept so that rights of the defaulting right holders can be suspended.

11.5 Record:- All cases of fires are to be registered with police for investigation and bringing the culprits to book soon after the out break of fire. The fire reports on prescribed proforma are prepared immediately after controlling the fire highlighting cause of fire, extent of area burnt and damage done, suggestions for the treatment of area and safe guards for future incidences. The fire reports should contain a map of the area burnt. All the fire reports are sent to higher authorities and follow up action taken accordingly.

11.6 Treatment of the Fire burnt area:- A closure notification of the burnt area should be got issued immediately and rights of the users suspended for such a period as considered necessary to regenerate the burnt area. The area is then fenced. The burnt dry and dead bushes and trees are cut and the area is isolated to prevent spreading further fires. The area is then taken up for planting soon after the fire so that bushes and weeds do not invade the area. In Chil areas planting of broad leaved species should be given preference along nalas and depressions as they act natural lines and prevent spreading of fires.

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CHAPTER-XII

RESIN TAPPING

12.1 General: The experiments for Resin tapping of Chil trees were started in India towards the close of the last century, first in united province. The tapping of Chil on commercial lines in the Punjab was under taken in 1912 and since then it has gradually developed and embraced almost all the chil forests of the State. The resin tapping by cup and lip method was started quite late in this Division i.e. during 1937 when about 10 sections (1 section = 1000 blazes) of dehati forests of Gochar block were given to a contractor at the rate of Rs. 15/- per 100 channels. During 1938, 20000 blazes were tapped and gradually the number increased to 298944 during the year 1952-53. In 1989-90 the number got reduced to 39612. only when rill method of resin tapping was introduced in this Division. By 1992-93 all the 108263 blazes were brought under rill method. The resin tapping was done through contractor agency till 1967. Thereafter till 1975-76 the resin tapping operations were carried out departmentally when this work was entrusted to H.P. State Forest Corporation Ltd.

12.2 Tapping Techniques:- Chil pine used to be tapped for extraction of resin by French method commonly known as Cup and Lip method since its inception. It has been observed that in this method no effective control on depth of blaze can be exercised and this resulted in loss of valuable timber and is also responsible for high mortality of chil trees due to fires. The resin channels in the conventional method not only destroy, the butt end log of about 2 meters length but also make the tree fire prone. Researches at FRI Dehra Dun have resulted in an improved method of resin tapping now known as "The Rill Method". This method has been adopted in Himachal Pradesh only in the last decade and now all the resin tapping is done by Rill Method only. The French cup and lip method has been completely stopped in Govt. forests. However, practice of resin tapping by this old method in some private areas is still continuing. Effort should be made to persuade such owners to switch over to the rill method of tapping H.P. Forest Mannual Vol-IV contains descriptions of the Rill method. Some of the important features of this method are:-

a) The guide provided in the freshening knife limits the depth of the blazes to only 2 mm in live bark and sapwood and does not damage the heartwood.

b) Fast healing up of shallow blazes makes it possible to tap the trees for a second cycle, thereby increasing the tapping life of the trees.

c) The obligatory use of stimulant facilities a prolonged tapping season resulting in increased resin production and employment to the tappers for a longer period.

d) Yield of resin per tree per season is 25% more than conventional method under this method.

e) There being practically no crape resin, the loss of turpentine is negligible.

12.2.1 The important operations involved in Rill method are as under:-

a) **Enumerations:-** The Chil trees to be tapped are enumerated at regular interval of 5 years. The work of enumeration is done after the tapping season is over in November and is completed by December. All trees above 30 cm d.b.h. are considered fit for tapping by Rill method. Each tree is serially numbered with punch mark. For making these numbers, the bark is smoothed on the north side of the tree at about 1.5 m from the ground. The summary of enumeration is kept in the prescribed form 'A'. One Forest Guard with 3 labourers can enumerate about 400 trees is one day. 1000 blazes constitute a section. Each section is normally placed under the control of a tapping labourer.

b) **Tools and Material:-** The following items are required by each tapper in the Rill method.

Sr. No.	Particulars	Quantity / No. required.
1.	Bark Shaver	1
2.	Blaze Frame	1
3.	Spray bottle	1
4.	Pots	According to the no. of blazes to be worked
5.	Hammer cum nail puller	1
6.	Pot scraper cum groove cleaner	1
7.	Groove cutter	1
8.	Freshening knife with sharpened blade	1
9.	Marking Gauge	1
10.	Bullock shoe nails	1.25 Kg.

11.	Wire nails	1.00 Kg.
12.	Wooden board	1
13.	Collection can	1
14.	Measuring cylinder (500 ml.)	1
15.	Measuring cylinder (50 ml.)	1
16.	Beaker (1000 ml.)	1
17.	Beaker (500 ml.)	1
18.	Funnel	1
19.	Containers for Acid (10 Ltrs.)	2
20.	Sulphuric Acid	2.5 Liters
21.	Nitric Acid	3.5 Liters
22.	Sharpening stone	1

c) **Setting of Crop:**

i. **Shaving the Bark:-** With the help of bark shaver, the loose and rough bark is removed over a surface area of about 45 cum x 30 cm leaving a space of about 15 cm from the ground level. The surface is made fairly smooth and the thickness of the bark left is not more than 2 mm to facilitate freshening of the blaze. At this stage no crevices are left in the bark and it is reddish in colour. It is advisable to remove the bark over the surface area to be covered in two years in the interest of saving the labour cost.

ii. **Marking the position of blaze and groove:-** The blaze frame is placed on the shaved stem of the tree in a vertical position 15 cm above the ground level and the position of the blaze is marked with marking gauge and also the position of the central groove with the help of wooden board.

iii. **Cutting the central groove:-** The central groove is cut with the help of groove cutter, drawing the cutting tool from above downwards. During the 1st year of tapping, when the blaze is very close to the ground level, it becomes necessary to cut the groove by moving the tool from down to upwards. However in subsequent years the groove may be cut from top of the blaze downwards.

iv. **Fixing the lip:-** The lip is fixed to the tree with two bullock shoe nails. The lip is pound properly so that it fits snugly against the tree. A 5 cm long wire nail is driven in to the tree about 2 cm below the mid point of the lip for hanging the collection pot on it. The nail is driven at a slight angle so that the pot hangs firmly against the tree.

d) **Freshening:-** For freshening, the freshening knife is placed at the lowed point of the central groove and then pulled along the blaze line marked on the tree. The same operation is repeated on the other side of the groove. For second and subsequent freshening repeated at weekly interval, the guide of the freshening knife is moved touching the upper side of the previous rill. The rills should be parallel to each other and should neither extend beyond the limits of the blaze nor fall short of it. Similarly equal space should be left between consecutive rills. The average width of the bark left between consecutive rills is 5 mm and the average width of the rill is 6 to 7 mm. In this way the blaze attains a height of 35 to 38 cm in one season of tapping and the depth of rills is about 2 mm into the wood.

e) **Preparation of stimulant:-** The stimulant used on the blazes is a 20% solution of mixture of sulphuric and nitric acids. To prepare the solution, take 875 ml. of pure water in a beaker and add to it 55 ml of concentrated sulphuric acid little by little with constant stirring. Then add 70 ml of nitric acid. Precautions should be taken while adding the acids to water slowly and in no case water should be added to the concentrated acids. Pour the solution in the spray bottle to fill it up to its 2/3rd capacity. Never fill the bottle to its full capacity to avoid bursting when pressed.

f) **Treating the blaze with stimulant:-** After making a freshening on both sides of the blaze, the chemical stimulant is sprayed on the freshly cut rill by squeezing the plastic bottle and moving its nozel in a steady motion along the rill. For obtaining good spray the plastic bottle should be held at 45° angle to the tree and its nozzle should be kept about 3 to 5 cm away from it. Enough acid should be sprayed on the rill. Precaution should be taken to hang the pot on the nail only after the extra acid has run down the lip.

g) **Collection of Resin and Cleaning of groove:-** The pot is removed from the tree and the resin is poured into collection can. The resin adhering to the pot is removed with the help of scraper. Central groove is also cleaned after each collection to avoid accumulation of resin in it. For improving labour output

collection of resin from the pots should be done with alternate freshening every fortnightly in March, April and August to November. If necessary pots of bigger size may be used. However from May to July collection may be done with each weekly freshening.

h) **Cleaning of lips and pots:-** At the end of the tapping season, the nails are pulled out and lips removed. The lips and pots are washed with warm water containing washing soda to be used in the next season.

i) **Installation during next tapping season:-** For installation in next year, the position of the second blaze is marked above the top of the 1st year blaze and other operations of setting blaze of 1st year are repeated. After tapping for 2 years the blaze reaches a height at which it is not possible to pull the freshening knife upwards. Thus during the 3rd year freshening is given by pushing the freshening knife upwards from the central groove towards the outer edge of the blaze. Likewise the blaze is extended upwards for the subsequent years. During the 5th year of tapping it may be necessary to use a ladder. During 6th year a new blaze is made at the bottom of the tree in the same manner as in 1st year leaving 7.5 cm wide space along the circumfrance of the tree from the edge of the 1st blaze. In this way a tree having an average diameter of 35 cm of average quality can accommodate four blazes of 20 cm width and will be available for tapping for 20 years in the 1st round.

12.3 Sale of Resin:- The resin extracted in the State is used primarly for running Rosin and Turpentine Factories of H.P. State Forest Corporation. Some resin is however allotted to other private units at a rate fixed by the H.P. State Forest Corporation. Sale rates of resin during the last two years are tabulated below:-

12.4 The number of resin blazes tapped, total resin extracted and yield per section have been given in para 3.4.1 of part – 1 from 1994-95 to 2008-09

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CHAPTER – XIII

FIRE PROTECTION

13.1 SPECIAL OBJECTS OF MANAGEMENT

The special objects of management are as under:-

i) To protect the hill sides from further denudation and erosion by preserving and enhancing the forest cover and by undertaking soil conservation works in a planned manner, where ever necessary.

ii) To conserve moisture and streamline the flow of water in streams and *nalas* by protecting and enhancing vegetation cover in the watershed.

iii) To improve the growing stock in quality as well as in quantity by sowing and planting of suitable species.

iv) To protect the ban oak and other valuable broad leaved forests from indiscriminate exploitation and to preserve these as representative eco-systemS of the region.

v) To provide a suitable habitat for wild life and to protect non timber forest produce naturally growing in high altitudes.

vi) Consistent with the principles of soil conservation, to provide for grazing of sheep goats and buffaloes of local and migratory graziers who come to these areas and also to meet the genuine demands of right holders for timber and other forest products.

13.2 METHOD OF TREATMENT The prescriptions in this chapter have been subdivided into following parts

v) Fire Management

vi) Invasive Alien Species Management

vii) Soil Moisture Conservation

viii) Encroachments

13.3 CLEARING OF ROADS Accidental fires in Chil forests are caused by lit cigarettes negligently thrown by passersby. As all Chil forests have sufficient fallen needles during summers (April –June), it easily catches fire and results in forest fires most of which are restricted to ground. To address this, both sides of roads upto 10m will

be cleared off the pine needles twice a fortnight. The needles thus collected will be either control burnt in presence of forest official (FG/FW) or will be made use of in making check dams/vermicompost/briquettes.

13.4 NEEDLE COLLECTION Another important and probably the most common reason for fires in Chil forests are the intentional fires lit by locals to get fresh flush of grass from the forests. To combat such fires following strategies may be adopted singly or in combination:

13.5 PARTICIPATION OF LOCAL PEOPLE Since all such fires are caused by local people especially those having cattle, thus involving these stakeholders in fire management may help. Awareness programmes combined with monetary incentives could be tried here. Fire management committees may be constituted at Panchayat level or existing /new JFMCs may be involved. The incentive for protecting 100 ha forest may be fixed as follows:

i) No fire: Rs 10,000

ii) 1 fire: Rs 5000

iii) 2 fires: Rs 2000

iv) More than 2 fires: No incentive

The area chosen for such schemes will thus save on deployment of fire watchers and the amount so saved will be used towards paying the incentive.

13.6 DEPLOYMENT OF FIRE WATCHERS In areas where cooperation from local people is not forthcoming or habitations too far from the forest to keep a vigil against fire, fire watchers may be deployed who will patrol the forests and alert the **Rapid Response Team** specially constituted at Range level during fire seasons.

13.7 USE OF PINE NEEDLES Another way of addressing the issue of fire is to make use of the pine needles. It could be in any form like handicrafts, fire briquettes, check dams etc.

Presently in H.P. handicrafts of Chil needles are being made by Kangra Mahila Sabha, Dharamsala and they have imparted such training to SHGs formed by MHWDP in Salooni, Chamba. After making a study of the economics of the enterprise, the same may be adopted in Bilaspur. However, as the exercise would involve identification of marketing channel etc, it is better to get it done through an NGO or any local Community based organization that are already into marketing of handicrafts.

Pine briquetting has also been tried in several places. This activity will not only save the forest but also help to improve seasonal livelihood of rural people. State Council for Science Technology & Environment has tried this enterprise in certain Panchayats. After making a study of the economics of the enterprise, the same may be adopted in Bilaspur.

Similarly pine needle check dams, *Pirule* have been made in Uttarakhand Forest Department and have also been tried in Kalatop Khajjiar Wildlfe Sanctuary. The collection of needles may be executed through JFMCs .This will result in dual advantage to JFMCs from Chil forests and will help in creating stake in Chil forests which otherwise generally being a monocrop of timber species (which means no immediate use/ access to resource) are neglected by people.

In forest compartments that are under active resin tapping, HPFDC resin workers or resin agents should get such compartments cleared of fallen pine needles atlewast twice in the fire season. This condition should be built into the agreement with the Corporation at the time of handing over the forest to them. Failure to comply should attract a penal price to the Corporation

13.8 INVASIVE ALIEN SPECIES: STRATEGY FOR CONTROL AND REHABILITATION OF AFFECTED AREAS

INTRODUCTION: Biological invasions – one of the anthropogenically mediated ecological perturbations – are threatening native biodiversity, preventing natural ecological succession and changing the community structure and composition, besides impacting ecosystem services. *Lantana camara* is perhaps one of the most important invasive alien plant species (exotic weed) in forest ecosystems of India as also in Bilaspur Division. Other alien invasive plant species with significant impact on the forests of Bilaspur Division include *Parthenium hysterophorus*, *Eupatorium* (=*Chromolaena*)

adenophorum, and *Ageratum conyzoides*. Whereas the incidence of *Parthenium* popularly known as *'Congress Grass'* is largely restricted to degraded and newly opened drier sites along roads and forest fringes, the other three invasive alien species tend to occupy all possible vacant places even under tree canopy. Even as *Eupatorium* and *Ageratum* show a clear preference for moister locales and show gregarious occurrence, at many places these share the niche and grow in an intimate mix with *Lantana*.

A reconnaissance was made during January 2011 to map the distribution of exotic weeds in various compartments in this Division. Whereas, it was possible to record the incidence of *Lantana* fairly accurately, the area infested with the other 3 main invasive alien species could not be recorded comprehensively due to these species being still in dormant condition.

Distribution if Invasive Alien Species in Bilaspur

Bilaspur Forest Division, Bilaspur

Format for anyalysis of data regarding Forest Invasive Species.

Chil Working Circle

Weed Infestation extent

No. of compartments

Range.	<=25%		<=50%		<=75%		<=100%		Co- relation with fire incidents in las five years		
									Compartments that are sold as grass godowns/ bhabar grass.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha)
Swarghat	23	568.21	27	938.65	16	419.44	1	41.31	6	6	28.80
Sadar	1	30.86	2	99.23	0	0	0	0	6	3	70.0
Jhanduta	9	194.76	29	756.22	27	537.87	8	260.85	11	10	186.60
Ghumarwin	9	252.58	11	203.52	5	128.45	2	32.40	2	2	35.00
Kalol	4	41.60	6	57.27	8	143.44	2	24.40	1	1	20.0
Bharari	22	268.12	17	388.70	22	313.25	0	0	14	24	149.00
Total	68	1356.13	92	2443.59	78	1542.45	13	358.96	40	46	489.40

Plantation Working Circle

Weed infestation extent

No. of Comprtments

Range.	<=25%	<=50%	<=75%	<=100%

	No.	Area	No.	Area	No.	Area	No.	Area	Co-relation with fire icidents in last five years		
									No. of fire incidences	No. of compartments affected	Area burnt (Ha)
Swarghat	9	502.66	9	1138.5	17	2104.14	10	2223.10	6	6	105.0
Sadar	3	103.60	4	173.06	4	334.38	0	0	7	1	36.0
Jhanduta	0	0	0	0	7	93.72	2	10.80	0	0	0
Ghumarwin	0	0	3	14.09	1	15.60	0	0	0	0	0
Kalol	3	14.0	5	268.20	4	259.33	1	45.66	2	2	41.0
Bharari	0	0	0	0	2	104.48	0	0	0	0	0
Total	**15**	**620.26**	**21**	**1593.9**	**35**	**2911.65**	**13**	**2279.56**	**15**	**9**	**182.0**

Plantation WC

Weed Infestation extent

No. of compartments.

Range.	<=25%		<=50%		<=75%		<=100%				
	No.	Area	No.	Area	No.	Area	No.	Area	Co-relation with fire icidents in last five years co-relation with grass production		
									No. of fire incidences	No. of compartments affected	Area burnt (Ha)
Swarghat	10	352.19	4	279.84	8	391.17	1	25.10	0	0	0
Sadar	15	335.88	73	1543.0	61	1784.0	2	126.46	43	33	426.0
Jhanduta	5	28.51	13	222.75	32	328.07	21	338.36	5	5	23.50
Ghumarwin	21	200.01	37	781.61	22	640.47	9	374.48	0	0	0
Kalol	6	75.36	20	571.87	16	508.45	18	321.69	4	4	23.0
Bharari	9	26.04	3	14.22	10	97.36	0	0	1	5	0
Total	**66**	**1018**	**150**	**3413.29**	**149**	**3749.52**	**49**	**1186.09**	**53**	**47**	**472.5**

Bamboo WC

Weed Infestation extent

No. of compartments.

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire incidences in last five years.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha

Swarghat	1	25.60	3	272.31	1	49.13	0	0	0	0	0
Sadar	0	0	1	39.2	0	0	0	0	2	1	20.0
Jhanduta	0	0	0	0	0	0	0	0	0	0	0
Ghumarwin	0	0	0	0	0	0	0	0	0	0	0
Kalol	0	0	0	0	1	53.04	0	0	0	0	0
Bharari	0	0	0	0	1	118	0	0	1	1	5.0
Total	1	25.60	4	311.51	3	220.17	0	0	3	2	25

Protection Working Circle

Weed Infestation extent

No. of compartments.

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire incidences in last five years.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha
Swarghat	0	0	0	0	1	23.37	0	0	0	0	0
Sadar	0	0	3	61.95	4	75.80	0	0	1	1	10.0
Jhanduta	0	0	0	0	0	0	0	0	0	0	0
Ghumarwin	0	0	0	0	0	0	0	0	0	0	0
Kalol	5	244.23	5	193.53	14	805.7	12	1026.77	3	3	27.0
Bharari	0	0	0	0	0	0	0	0	0	0	0
Total	5	244.23	8	255.48	19	904.87	12	1026.77	4	4	37

Any othr territorial W/C (other than overlapping WC)

Weed Infestation extent

No. of Compartmetn

Range.	<=25%		<=50%		<=75%		<=100%		Co-relation with fire incidences in last five years.		
	No.	Area	No.	Area	No.	Area	No.	Area	No. of fire incidences	No. of compartments affected	Area burnt (Ha
Swarghat	0	0	0	0	0	0	0	0	0	0	0
Sadar	0	0	0	0	0	0	0	0	0	0	0
Jhanduta	0	0	1	17.56	9	126.11	2	10.8	0	0	0
Ghumarwin	2	11.76	3	120.31	3	7.99	0	0	0	0	0
Kalol	0	0	0	0	0	0	0	0	0	0	0
Bharari	0	0	0	0	0	0	0	0	0	0	0
Total	2	11.76	4	137.87	12	134.1	2	10.8	0	0	0

Strategy for rehabilitation of forests infested with these four most noxious exotic weeds is dealt in detail as under:

CORE PRINCIPLES OF THE STRATEGY

- **CONTAIN FURTHER SPREAD** : *A close watch over the spread of exotic weeds will be kept through biennial monitoring mechanism and necessary corrections in the program will be made to remove the recent infestations on priority basis.*

- **COMPLETE REHABILITATION OF INFESTED AREAS**:*It will involve shift from 'one time removal of weeds' to 'complete rehabilitation' of the treated areas by competing/ shading out exotic weeds. All noxious exotic weeds on any given area will be tackled simultaneously.*
- **RELIANCE ON ONLY MECHANICAL/MANUAL METHODS**: *In view of their environmental/ ecological concerns, the rehabilitation measures will NOT employ any Chemicals/ Biological methods of exotic weed control.*
- **NATURAL RESILIENCE OF NATIVE FLORA TO BE THE BASIS OF REHABILITATION ACTION:** *The natural regeneration of indigenous plant species on treated sites will be encouraged and facilitated to establish towards better environmental and ecological services, including fodder, fuel, water recharge, etc.*
- **NO EXOTIC SPECIES TO BE USED TO REHABILITATE TREATED SITES** *No potentially invasive exotic species – (viz. Leucaena leucocephala, Prosopis juliflora, Jatropha curcus, Tecoma stans, Tectona grandis, etc.) - will be used for plantation in the areas under rehabilitation, because of their deleterious effect on the native flora.*
- **REHABILITATION TO START FROM LOW INTENSITY INFESTATION AREAS AND TO PROGRESS TOWARDS AREAS WITH HEAVY INFESTATION:***Rehabilitation activities will start from the fringes of infestation zone with lower intensity infestation and will progress towards the heavily infestation areas. This approach will (i) allow tackling larger areas with the given financial resources and result in creating quick visible impact, and (ii) help in containing further spread of exotic weeds.*

- **SELECTIVE PRIORITY REHABILITATION OF HEAVILY INFESTED CRITICAL HABITATS:** *Rehabilitation of heavily infested areas as starting point will be taken up only in limited number of carefully selected* ***critical habitats*** *like grazing grounds near habitations. Such sites will then act as nucleus from where rehabilitation activity will radiate to adjoining areas of high infestation.*

With the above mentioned core principles of the strategy, the approach/ plan to implement the strategy will be as under:

(a) MANAGEMENT OF *LANTANA* With the major focus of the management strategy on 'containing further spread', a two pronged approach, as described below, will be followed in tackling *Lantana* menace on forest lands. Table 4.2 gives spread of Lantana and the intensity of infestation.

APPROACH-I (FOR AREAS WITH LOW INFESTATION INTENSITY) More than 60% of the forest areas recorded to be under *Lantana* have been infested with this exotic weed within the past 10 years and have less than 25% intensity of infestation. Under this approach, these areas will be tackled on priority basis for the reasons that (i) with the given financial resources, it would be possible to rehabilitate larger areas for creating significant impact, and (ii) further spread of this exotic weed would be contained.

The rehabilitation activities will be started from the fringes of infestation zone with low intensity infestation and will progress towards the high infestation areas. Major activities under this approach will be manual cutting of *Lantana* bushes and encouraging establishment of local species, including grasses or augmenting populations of native species through plantation.

- **APPROACH-II (FOR AREAS WITH HEAVY INFESTATION)** Under this approach, critical areas under heavy infestation, especially the grazing grounds near habitations, will be identified and treated.

  The rehabilitation activities will start from the selected critical area that will act as nucleus, and will radiate from this nucleus to cover adjoining areas of high infestation. Major activities under this approach will be manual cutting of *Lantana* bushes, encouraging establishment of local species, including grasses and planting the areas with tall plants of fast growing species to quickly shade out *Lantana*.

The methodology to implement the above two approaches will be as follows:

- Method of cutting *Lantana* will be Cut Root Stock (CRS) method i.e. cutting the bushes below the soil to prevent coppicing. **(See box below for details).**
- **Forest beat** will be the unit for rehabilitating *Lantana* infested sites. Financial resources available under various schemes will, therefore, be converged towards this end.
- Local people, through existing community groups, will be encouraged to participate in rehabilitation of *Lantana* infested areas. Stake of local people will be built into this initiative under the available JFM instruments.
- The following will be, based on local practices, standardized for effective implementation of *Lantana* management initiative:
    - Cutting tools/ techniques
    - Calendar of rehabilitation activities
    - Cost models
- A three year active maintenance of the treated areas and triennial follow up thereafter will form integral part of the rehabilitation program till the areas gets fully rehabilitated. During this period, constant vigil will be maintained on any opportunistic springing back of sprouts/ seedlings of the invasive alien species and the same will be immediately removed. At the same time, progress of establishment of the native species will be actively monitored and encouraged.
- An average of 150 hectares of *Lantana* infested areas will be taken up for rehabilitation per year.

METHOD FOR REMOVAL OF LANTANA

Removal of adult clumps using 'Cut Root Stock' (CRS) method: This method involves cutting the main tap root of *Lantana* plant beneath the 'coppicing zone' (transition zone between stem base and rootstock) (Figure 1). This method of removal involves engagement of 2–3 individuals to work in a group for the removal of *Lantana* if the clumps are too large to be handled by one individual after the rootstock is cut. The steps involved in the cut rootstock method are:

(v) The person, who engages in removal of *Lantana*, is positioned in a way that he stands near centre of the *Lantana* clump with his back facing the clump and holding the handle of digger (kudal)

(vi) Using the specially designed digger, the person cuts the main rootstock of *Lantana* 3–5 cm below the soil surface by hitting the rootstock 3 or 4 times; while hitting the rootstock the blade of the digger gets lodged into the main tap root, and at this point it is useful to move the handle of the digger in the forward direction away from the body of the person so as to severe the connection of the clump with the main tap root. In case the clumps of *Lantana* form impenetrable thickets, it is advantageous to cut the rootstocks of 3–4 contiguous clumps to make the removal operation convenient. It may be noted that the branches of *Lantana* clumps should not be slashed/cut to gain access to the centre of the clump for its removal by cut rootstock method. The branches of *Lantana* thicket formed by more than one clump should be lifted and tipped over from one end by using a wooden or bamboo pole of about 1.5–2.5 m long and diameter 5–6 cm which is inserted just below the branches from one side and rolled over easily by two workers holding the pole at either end and pressing it so as to reach the centre of the clump Such manual handling of impenetrable thicket is possible because of the umbrella type of canopy which makes it difficult to reach the centre of clump easily. Such physical maneuvers minimize or prevent regeneration from rooted cut branches when they fall on the ground.

(vii) Lift the clump/s and place the clump/s upside down. If the clump is not placed upside down, the prostrate rooted branches and the aerial old branches having aerial roots at nodes may develop into adult plants when they come in contact with the soil. Therefore, the upside–down orientation of cut clumps is critical in the prevention of regeneration of *Lantana* from cut clumps. It may be noted that *Lantana* does not produce root suckers.

(viii) After drying the clumps, the clumps may be used as fuel or burnt at the same site or all the dried clumps may be collected at one place and then burnt. The best time for removal of *Lantana* is just before rainy season, i.e. when the plants are not in flowering and fruiting.

(b) MANAGEMENT OF OTHER INVASIVE ALIEN SPECIES (*PARTHENIUM, AGERATUM, EUPATORIUM*) The spread of these three species is largely restricted to the open lands including forest fringes, degraded pastures and areas having soils that are recently exposed due to landslips, erosion, soil cutting or muck dumping. The reconnaissance has shown that the there is a large overlap of areas under different invasive alien species with these three noxious weeds also occurring, though each of these occupying different niches, in most of the forests that are infested with *Lantana*.

The basic approach to rehabilitate areas infested with these three invasive species will be as under:

- **APPROACH-I (AREAS WHERE INFESTATION OVERLAPS WITH *LANTANA*):** Such situation occurs under Chil, miscellaneous broad-leaved and scrub forests. In such areas removal of these three exotic weeds will be taken up simultaneously with removal of *Lantana* and the treated areas rehabilitated with fast growing native species/ grasses.
- **APPROACH-II (AREAS WHERE THERE IS NO OR LITTLE *LANTANA* INFESTATION):** Such situation usually comes across in pastures, degraded forests and recently exposed sites. In such areas, manual uprooting of these exotic weeds just on the onset of monsoon, when the soil is moist, will be employed.

SOIL AND MOISTURE CONSERVATION The main objective is to protect hill slopes from further denudation, erosion and to maintain the equitable flow of water in the rivers, streams, perennial *nallas* that originate from these hills, thus constant efforts should be made to maintain and increase the protective vegetative cover in such areas. These forests shall, therefore, be simply protected as such. No fellings shall be carried not even salvage removals as these areas are highly prone to soil erosion owing to steep slopes. Comprehensive Catchment Area Treatment Plan has been made for Satluj basin which will guide the soil moisture conservation measures to be adopted in Bilaspur Division..

Map of Ranges with micro-watershed boundaries has been given here.

The grazing in these forests is required to be regulated. The rotational closures supplemented with some soil conservation measures in the eroded areas would improve protective vegetative cover. Most of the forests in lower elevations are poorly stocked, carry scattered tree growth or are devoid of adequate vegetation cover. Such areas shall

be tackled by sowing, planting of suitable species and carrying out soil conservation works. These forests can be regenerated by artificial means.

ENCROACHMENTS In recent years encroachment of forest land has emerged as a big threat to forest land. This is more so in UPF. However in PFs also the incidence of encroachment is not uncommon. Thus the boundary pillars of forests must be maintained regularly, if any shifting is noticed, action must be initiated immediately under IFA, 1927.

PREVENTIVE REMEDIAL MEASURES

- The forest officials must be well conversant with boundaries of the forests under their jurisdiction. The range officers, block officers and forest guards must check the boundary pillars frequently and in case of damage to boundary pillars, immediate legal action to punish the guilty and repair work should be undertaken on priority. DFO/ACF should also inspect the boundary pillars while inspecting forests, plantations and other forestry works.
- The old stone masonry pillars should be replaced with cement mortar after proper demarcation. The new boundary pillars of only cement mortar should be constructed in future.
- The field staff should be made accountable and sensitive towards the ever increasing menace of encroachments. The forest guard must initiate legal action as soon as the encroachment is noticed by him. He should chalk out the damage report and report the matter to range officer through block officer. The block officer should immediately seek demarcation and Chillan the case in the appropriate court. Range officer must act quickly to file the case in the court; the laxity at any level must be dealt with under CCS (CCA) Rules.
- All the encroachment cases on forest land are within the jurisdiction of DFO as collector of the division under H.P. Public Premises and Land (Eviction and Rent Recovery) Act, 1971. Range officers should challan all such cases before collector for speedy trial.

- The powers of carrying out demarcation are vested with the revenue officers under H.P.Land Revenue Act, 1954 and as such, many times, the demarcation of forests is delayed due to their pre-occupation. It is therefore, suggested that the Tehsildar, Kanungo who are on deputation with the forest department be delegated the powers of demarcation of forests to process encroachment cases expeditiously.

STRATEGY

v) Repair all existing boundary pillars and construct more boundary pillars close to habitation. For this areas need to be identified that are prone to encroachments.

vi) Railway girders should be used in encroachment prone areas and all BP s should be depicted in digitized maps of the area which will be maintained a permanent record.

vii) As a deterrent, FIRs should be registered as soon as an encroachment is detected. Court proceedings will then follow.

viii) Latitude, longitude and altitude readings of all Boundary Pillars(old and new) to be recorded in the BP register and database in the Division office

ILLICIT FELLING With development of good network of roads, there has been an increase in incidences of illicit felling.

SMUGGLING OF TIMBER: - The high price of timber in the market has attracted/created tendency to become rich overnight and hence the smuggling of timber takes place more than often. The illicit felling and smuggling are both related, many times organized. The incidences of smuggling have, however, reduced after the amendment in Indian Forest Act (H.P.2nd Amendment 1991) vide which DFO has been designated as Authorized Officer to hear the cases pertaining to illegal transportation of Govt. property i.e. .timber, resin, khairwood and katha and may order confiscation of both forest produce and the vehicle involved. The detail of cases admitted and decided in the court of Authorized Officer Bilaspur under 52A is given below:

Vehicle seized during smuggling of Forest produce.

FIR NO. and date.	Vehicle No.	Forest property seized.	Remarks.
2/2002 dated 2.1.2002	HIH 557	50 No. Resin filled Tins	Vehical released on Supurdari Bound and case Under Trial A.O.
108/2003 dated 15.3.2003	HP-28 -1628	19 resin filled Tins	Under trial A.O.
16/2006 dated 12.1.2006	HP 69-0112	31 Khair Logs	-do-
128/2008 dated 28-3-2008	HP-51B0408 Mohindra Pick Up HP 14 B-T-5328 Indica Car.	32 Khair Logs	-do-
23/2009 dated 7.2.2009	HP-20-8840	30 Khiar Logs	-do-
226/2010 dated 20.11.2010.	HP24 -3773	7 Deodar scants	-do-
24/2011 dated 13.3.2011	HP23B-5143	17 Khair Logs	-do-
Nil dated 5.4.2011.	HP67-0698	14 Khair logs	-do-

(Source: Office Record, DFO Bilaspur)

13.9 STRATEGY

i) **VAN THANA BASSI**: One Van Thana has been established in inter-state border area i.e. Bassi Block of Swarghat Range of this Division which which will control the illegal activities along the border areas and this Van Thana team is to be provided with vehicle, weapon and with effective and adequate communication equipments and will be exclusively responsible for protection works including illicit felling, illegal mining, encroachments, forest fires, wildlife poaching etc.

ii) The offences so detected by Van Thana team is to be properly and promptly dealt under the Van Thana Rules notified by the Govt. of H.P. from time to time and stringent action against offender will act as a deterrent.

iii) Whenever any vehicle is apprehended or timber is seized, that should be disposed off immediately (after seeking permission from court) before there is any depreciation in the value.

CHAPTER - XIV

MISCELLANEOUS REGULATIONS

14.1 Petty Fellings: _ Fellings of petty nature of following kinds may be carried out with the sanction of Conservator of Forests/Principal Chief Conservator of Forests/Government as the case may be:

a. Dry fallen and fire damaged trees occurring scattered in forests.
b. Trees required for departmental use or for supply to the other Govt. Departments.
c. Trees faring under alignments of transmission lines, roads and other development projects.
d. Trees required for research by the Silviculture Division of the department, universities or Forest Research Institute and Indian Council of Forestry Research and Education and also elsewhere.

14.1.1 All trees and poles marked will be entered in the compartment history files. Volume of all such trees will be counted towards yield.

14.2 Deviations:- All fellings not prescribed in the working plan will constitute a deviation. These deviations will appear in the control forms. Ordinarily no deviations are allowed except with prior sanction of the Principal Chief Conservator of Forests.

14.3 Grazing: - In the settlement report of 1912, a gradual reduction in the number of migratory flocks of sheep and goats was contemplated in the interest of forest conservancy, but nothing could be done in this matter. The number of migratory flocks has instead increased due to sub-division of migratory families. Similarly the domestic animals of the local people have also increased manifold. Since no restrictions were imposed in this settlement on the number of domestic animals allowed to be grazed in a forest. The grazing pressure is continuously increasing. On the other hand the grazing grounds have shrunk due to submergence of forest area in Gobind Sagar, allotment of UPFs as nautors to the oustees of Bhakra and cement factory at Barmana and encroachments done by local people. The condition of the forests is degrading due to over grazing as indicated in table 12.1

TABLE – 12.1

a)	Total Geographical Area of the District as per village papers	1,15,470 ha
b)	Total Area of forests and waste lands available	80,914 ha
c)	Area available for grazing after deducting $1/3^{rd}$ area of forests i.e. 1/3 x 43068 = 14689 ha. For raising plantations	66,225 ha

14.3.1 From the above it is clear that for safe grazing 435593 ha area is needed for 871186 grazing units as per the recommendations of the grazing committee. Against this only 66225 ha is available for grazing in this Division. Therefore, grazing incidence is 6.6 of the carrying capacity.

14.3.2 The overgrazing of forest areas is resulting in:-

i) Accelerated soil erosion due to denudation of forest vegetation.

ii) Failure of plantations due to illicit grazing as the palatable grasses and bushes remain there which tempt the graziers.

iii) Migration of herbivores takes place due to non availability of good fodder in sufficient quantity in the forests. This compel leopards to become cattle lifters in the absence of their natural prey

i) Deterioration in the quality of domestic animals due to lack of nourishment.

14.3.3 To cope with this problem, the solution lies in the replacement of inferior and stray cattle with those of improved varieties and under taking other measures as under:-

- Promiscuous breeding of herds of useless animals should be discouraged by castration of scrub bulls, male goats and rams. For the useless cattle a chain of Gosadans should be established. One such Gosadan has been established in UPF Barota Dhowala in Swarghat Range for 100 cattle.
- An intensive programme should be taken in hand for improving the breed of useless animals by artificial insemination. Villagers should be helped to purchase cows and sheep of improved varieties both financially and technically.

- Awareness programme should be under taken through audio and visual media so that awareness regarding harmful effects of over grazing and benefits of stall feeding may be spread among the villagers.
- For the reduction of stray animals, heavy grazing fee should be imposed and concessions allowed for improved varieties particularly of sheep.
- The flocks of migratory graziers should be reduced as envisaged in the settlement report of 1912. Except cattle kept for domestic and agricultural purposes, no other cattle should be allowed grazing as per rules of Mahduda Forests given in appendix M.
- The grass and the grazing lands should be improved by way of introducing nutritious grasses and fodder yielding trees on scientific lines.

14.4 Lopping :- Lopping of bamboos, Khair and other such species is done indiscriminately and recklessly. A strict vigilance and enforcement of lopping rules described below is called for:

- No tree less than 45 cm in girth will be allowed to be lopped.
- No Branch exceeding finger thickness will be allowed to be lopped.
- Branchesoftreesabovetheupperhalfofcrownheightwillnotbeallowedtobelopped.
- For lopping the branches the cut should be given from underneath so that splitting of the branches be avoided
- As far as possible lopping should be allowed in one portion of the area and close the other in a season. In the next season the open area will be closed and lopping allowed in the other portion which remained closed in the previous season. Thus, through rotational lopping the wounds of trees are not only healed-up but more foliage is also available.
- No lopping of Chil, Khair, Kikar, Shisham and Tun should be allowed as provided under rules of Mehduda Forests.

14.5 Fodder Grass:- In the forest settlement of 1912 some of the Mehduda (Demarcated Protected) Forests and Dehati (Un-demarcated Protected) Forests were reserved for the production of grass. The grass on harvesting was then sold to the right holders annually. These areas were called grass godowns and are listed in appendix J. Over a period of time these grass godowns were planted with Chil and other species. In these areas grass produced is still being auctioned as here to before but the quality of grass has been deteriorated considerably. To improve the production and quality of grass in these grass

godowns introduction of improved species of grasses and legumes given below is recommended.

- **Grass Species**: - Setaria (*Setaria barbeta, S. glauca, S. intermedia, S. viridis*), Napier (*Pennisetum orientale, P. purpureum*), and *Panicum ccurviflorum, P. paludosum*, Blue Panic (*Panicum antidotale*) and *Panicum maximum* etc.
- **Legumes**: - Siratro (*Macroptilium atropurpureum*), *Desmodium* species, Stylo (*Stylosanthes guianensis*), Phasey beans (*Macroptilium lathyroides*) etc.

14.6 Bhabar Grass (*Eulaliopsis binata*):- Bhabbar grass from Swarghat Range is sold to M/S Bhallarpur paper Industries Yamuana Nagar on year to year lease basis. Being one of the best soil binder it also needs improvement. More and more area is required to be brought under Bhabbar grass. Itcan easily be propagated by tuft planting or raising the stock by sowing the seed in the nursery. The best method is to plant the tufts on the berms of staggered contour trenches of 1m x 0.45 m x 0.45 m and 3 meters apart This will also help in the conservation of soil and water.

14.7 Grant of Timber, Bamboo and Other Forest Produce to the Right Holders: - The requirement of timber, bamboos and other forest produce of the right holders will be met with as per provisions of the forest settlement of 1912 and as provided under rules of Mehduda Forests given in appendix I. In case of newly constituted DPFs the grant of forest produce will be regulated as has been determined for each forest by the settlement officers, the abstract of rights conversions so settled has been given in appendix B.2. As far as possible only dry and fallen trees should be given to the right holders after verifying their demands thoroughly and after ascertaining that no such tree is available in the private land of the right holders. The Chil trees being given to the right holders are used mainly for shuttering. As such quality trees are not required to be sanctioned. The trees granted to the right holders should not exceed their requirements in any case. If need be, one tree can be sanctioned to more than one person according to their requirements. No green trees of IIA & IIB classes are to be marked to the right holders as these are required for seed production. Similarly no marking of green trees for the right holders should be permitted in PB.11 areas. The procedure laid down under the rules of Mehduda forests will be strictly adhered to while granting trees to the right holders.

14.8 Roads and Buildings: The road and building programme is listed below:

ROAD & BUILDING PROGRAMME FOR THE YEAR 2012-13 & REVISED FOR 2011-12

1	2	3	4	5	6	7	8	9	11	
4216-Capital Outlay										
01- Residential building										
700-Other Housing under Forestry scheme										
Code No.	Sr. No.	Name of work/ Head of account	Year of starting of work	Estimated cost	Expenditure incurred upto 31.3.2011	Budget allocation for 2011-12	Revised requirement for the year 2011-12	Total requirement for the year 2011-12	Budget Requirement for the year 2012-13	Remarks
1	2	3	4	5	6	7	8	9	11	
		Maint. of B.O. Quarter at Bachretlu	2010-11	562000	300000	250000	262000	262000	0	
304-7		Completion of B.O. Qtr. At Panigain	2009-10	690700	450000	140000	240700	240700	0	
	3	Const. of Fgd. Hut at Sadyar		500000	0	0	200000	200000	300000	
	4	Const. of Fgd hut Swahan		500000	0	0	200000	200000	300000	
	4	Const. of Fgd. Hut Dharot		500000	0	0	500000	200000	300000	
	5	Const. of F.gd. Hut in the campus of Range office Ghumarwin		500000	0	0	200000	200000	300000	During the visit of the than worthy Pr. CCF .in Ghumarwin Range has issued direction to construct the F.gd. Hut in the campus of Range office Ghumarwin

	6	Special Repair of F.gd. Hut at Bachrettu		600000	0	0	600000	600000	0	Due to heavy land slide behind the building the cosntruction of Retaining wall urgently required to save the Govt. property and repair work is reqauired in the building
	7	Special Repair of F.gd. Hut at Malhot		300000	0	0	0	300000	0	
	8	Repair of Awareness-cum - Training Centre at Swsaghat		250000	0	0	250000	250000	0	
	G.Total			**4402700**	**750000**	**390000**	**2452700**	**2452700**	**1200000**	

Road & Building P:rogramme for the year 2012-13 & Revised for 2011-12

Code No.	Sr. No.	Name of work/ Head of account	Year of starting of work	Estimated cost	Expenditure incurred upto31.3.2011	Budget allocation for 2011-12	Revised requirement for the year 2011-12	Total coloum (6+8)	Budget Requirement for the year 2012-13	Remarks
1	2	3	4	5	6	7	8			
		4406- Capital Outlay on Forestry & Wildlife								
		01- Fty.								
		070 Communication & Buildings								
		02- Soon Buildings								
38010	1	Const. of FRH at Bandla Dhar.	2005-06	3607800	3549823	0	600000	4149823	0	The wsork of siad FRH will be completed if the funds

										are provided during the current financial year.
46602	2	Const. of FRH at Deoth	2006-07	2857700	2602276	500000	500000	3102276	0	
46603	3	Const. of FRH at Rajghati	2006-07	2289900	2659235	500000	500000	3159235	0	
51979	4	Const. of FRH at Harlog	2007-08	2966700	1249896	300000	600000	1849896	1200000	
51980	5	Const. of FRH at Kalol (Mala Tibba)	2007-08	3291600	1134800	300000	1100000	2234800	1056800	
51962	6	C/O of FRH at Malhot	2007-08	3116100	802270	800000	1100000	1902270	1214000	
		G.Total		**18129800**	**11998300**	**2400000**	**4400000**	**16398300**	**3470800**	

4406- Capital Outlay on Social Forestry & Wildlife

01- Forestry

070- Communication & Buildings

01- Soon Construction of Roads.

Code No.	Sr. No.	Name of work/ Head of acccount	Year of starting of work	Estimated cost	Expenditure incurred upto31.3.2011	Budget allocation for 2011-12	Revised requirement for the year 2011-12	Total coloum (6+8)	Budget Requirement for the year 2012-13	Remarks
1	2	3	4	5	6	7	8	9	10	11
303-05	1	C/O Bridal Path from Buhar Ghat to Paploa	2011-12	447000	0	447000	447000	447000	0	

14.8.1 Roads And Paths:- The existing forest roads and paths and the net work of P.W.D. roads reach most of the commercially important forests. All the P.W.D. roads in the Division are listed in Part-1 Chapter-III. Forest roads and paths are listed in Appendix D (1) No more roads are necessary. Inspection paths in all plantations and P.B.I. areas are prescribed in this plan will be constructed. The existing roads and paths and also those paths to be constructed under the prescriptions of this plan will be annually repaired and kept in serviceable condition.

14.8.2 Buildings: - Sufficient living accommodation is available for the staff of the circle and Division but most of these remain un-occupied as the staff posted is local and prefer to live in their private homes. Annual repairs of most of the buildings and rest houses are being badly neglected. Forest Rest House at Kuthera needs special repairs as cracks had developed in it soon after its construction. It has become inhabitable. No officer visits it. Though sufficient accommodation for ministerial staff has been constructed in Bilaspur the accommodation for field staff specially Forest Guards is not upto the mark. The existing Forest Guard huts are in a dilapidated condition and need major repair and improvements. Many of these Forest Guard Huts, being very old needs to be reconstructed. The buildings existing in this Division are listed in appendix E.

14.8.3 The following buildings are proposed to be constructed. Construction of Forest Guard huts and B.O. Quarters is proposed where these do not exist. Also reconstruction and improvement of these is proposed. Inspection huts and other buildings have been proposed wherever these are necessary. The list of such buildings is given in Para 12.8 above.

14.9 Water Supply: - The water supply to all the Forest Rest Houses is available and also to most of the residential buildings. D.F.O will ensure availability and maintenance of this basic necessity to each residential building.

14.10 Maintenance of Boundaries: - The task of preparation of boundary register, *repair of boundary pillars and checking of boundaries have been ignored badly in the* past. The boundary pillar registers of Sadar and Swarghat Ranges are not available and as such these are to be prepared afresh. The following areas which were denotified during 1980 vide H.P. Govt. notification No.F.5-32/80 dated 4.10.1980 need fresh demarcation and construction of boundary pillars accordingly.

Name of Forest	Total Area in Acres	Khasra or Section from which separated	Area excluded from Demarcated Protected Forest
Mungrani	196.00	1	196.00 acres (78.40 ha)
Sangan	2091.00	61/5/1	12.3 acres (4.98 ha)
Sungal	360.00	90/54/1	88.4 acres (35.77 ha)
Malyawar	2490.00	4/1	95.43 acres (38.62 ha)

14.10.1 Since checking of boundaries work has been totally ignored in the past and now it has come to light that DPF Baryans C.1 Sungle has been removed from the revenue record and ownership/ possession of DPFs Baryans C.2 Dhalli and Baryans C.3 Jhaleda have been changed from Forest Department to that of right holders or private individuals. The revenue entries are required to be corrected again.

14.10.2 The actual length of boundaries and the number of existing boundary pillars are listed in appendix - A. The positions of boundary pillars have also been marked on the stock maps. The boundary register must therefore be completed and made up to date in the 1st five years of the working plan. While making a record of boundary pillars forward and backward bearing with distances between boundary pillars must also be recorded. The quinquennial programme for checking and repair/construction of pacca boundary pillars is prescribed in table 14.1

TABLE-14.1

Range	2012-13 2016-17 & so on	2013-14 2017-18 & so on	2014-15 2018-19 & so on	2015-16 2019-20 & so on
Swarghat	Fatehpur C-1 to 4	Fatehpur C5 to 8	Fatehpur C9 to 12	Rattanpur C1 to 3 Naina Devi
Sadar	Baryans C1 to 5	Chamyon C1 to 5	Bahadarpur C1 to 2	Rattanpur C4
			Baryans C6 to 7	Chamyon C6 to 9
Bharari	Jhanjiar C1 to 4	Jhanjiar C5 to 8	Jhanjiar C9 to 12	Jhanjiar C13 to 15
Ghumarwin	Malyawar C1 to 7	Tiun C1 to 7	Jhanjiar C15 to 18	Samoh C1 to 2
			Tiun C8 to 11	Malyawar C8 to 12
Jhandutta	Smoh C3 to 11	Ghaniri C1 to 6	Gochar C1 to 10	Gochar C11 to 13
		Samoh C12 to 15		
Kalol	Bachhretu C1 to 9	Baseh C5 to 18	Baseh C19 to 32	Baseh C33 to 46
	Baseh C1 to 4			

14.10.3 The boundary pillars of newly constituted DPFS in future will also be checked and repaired in the year in which the turn of the block falls where these exist, D.F.O. will be competent to add these to the above mentioned programme.

14.11 Maps: - As mentioned in para 1.9.2 of Chapter-I Part-1, the survey of this Division was done by the Survey of India during 1983-84. At present only 13 survey sheets of 1: 15000 scale are available out of 17 survey sheets in which this division is covered and listed in para 1.9.1 of part-I, Sheet Nos 53 A/7 SE, 53 tu12 NW, 53 A/15 SW and 53 A/15 SE are not available which should be immediately procured from survey of India through C.C.F. working Plan and settlement or the authorised indenting officer of the Department. The maps prepared for this working plan are based on revenue maps of 1 . 15000 scale because the boundaries and areas of UPFs and DPFs shown on these sheets do not rally with those of revenue record. All important physical features like ridges, nalas, roads, paths and prominent buildings have been incorporated in these maps. The management map of the Division has been prepared on the basis of available old map after making necessary additions of newly created demarcated protected forests. The un-demarcated protected forests have not been shown in the management map. This has been done to avoid confusion because majority of them are being settled and proposed to be declared as Demarcated Protected Forests. In this map latest roads and buildings have also been incorporated.

14.12 Nautors and Encroachments: - The revenue authorities do not recognise the Undemarcated protected Forests as forest land and hold the view point that Forest conservation Act 1980 is not applicable to such UPFs. Therefore, large chunks of these forests have been given as nautors and diverted for non forestry uses in the past. In many cases even the beautiful plantation areas have been granted as nautors. The forest Department has been unable to stop this practice and do anything tangible. No complete record of UPFs and other forests areas on which nautors have been granted is available in the Division. DFO will procure such record from revenue authorities and in future will also maintain a comprehensive record of the nautors granted in forests areas. In future no nautor to allowed in UPFs without following procedure of the Forest conservation Act. All cases of spoliation to reported to Govt. in time.

14.12. 1 Encroachments by the Bhakra Dam and ACC Factory Barmana Oustees in UPFs and even in DPFs are not uncommon. The extension of cultivation into these forests is also very common. Vigorous efforts are required to get them vacated particularly in those cases in which the decision is in favour of the department. Now DFOs have been given the powers of collectors under HP Public premises and land (Eviction and Rent Recovery) Act, 1971 therefore DFO should imitate action to get all the encroached upon forest areas vacated. All out efforts should be made to get the forest areas entered with revenue records at the earliest.

14.13 Undemarcated Protected Forests: - Most of the undemarcated protected forests have been included in this Working Plan for the first time. The undemarcated protected forests having compact areas less than 2 ha, disputed undemarcated protected forests and left out areas of these forests which are being proposed to be declared as Demarcated Protected Forests have not been taken for regular management. Most of the disputed UPFs and also the UPFs having less than 2 ha compact area and others are listed in appendix - K which is also not exhaustive These are required to be checked periodically as a safe guard against encroachment.

14.14 Preservation Plot: - Compartment 1 of Bahadurpur reserved forest which has been allotted to rehabilitation working circle will actually be kept as a preservation plot. The area of this compartment is 58.80 ha containing Ban Oak over 74.49% area, Deodar over 17.01% area and Ban and Deodar over 8.50% area. Originally this compartment was of Ban Oak. Some portion of it has been utilised for raising. Deodar in different years since 1929 and it is doing well.

14.14.1 This forest is situated at an elevation ranging from 1470 to 1915 rn. This compartment consists of ban crop of all age classes having well grown old trees in the middle but quality and age of the crop is poor along the boundary. The under growth is very dense and impenetrable in some places. This is the only Ban and Deodar forest in this Division.

14.14.2 Ban trees upto 3 meters in girth are available in this compartment. Such trees will be preserved to act as monumental trees and a proper record of these will be maintained.

14.17 Temperature and Rainfall Statistics: - Due to non maintenance of rain gauzes installed in the past in this division all these have become out of order and no record of rain fall is now being maintained. This is not desirable. Either new rain gauzes be installed or the old ones repaired and made operational in every Range H.Q. and Rest House. Similarly maximum and minimum and also wet and dry thermometers are required to be installed in Range and Division Offices, so that accurate metrological data is available for use in future planning.

14.18 Wireless Communication System:-

14.18.1 With a view to ensure effective control on the movement of forest produce in *Himachal Pradesh, a wireless communication system was planned in 1992-93 and in the* 1st phase 42 stations have been made operational in 1993-94 throughout the state. All wireless stations established so far are operating on a single frequency (i.e. 159.900 M H Z).To avoid cross talk and interference proper code is assigned to each station. The various codes allotted in Bilaspur Forest Division are as under:-

Description	Code	Operational Stations
i) Bilaspur Circle	Four	Operational
ii) Bilaspur Division	Four One	- do -
iii) D.F.O Office Bilaspur	Four One One	- do -
iv) Swarghat Check Post/ Range Office	Four One Two	- do -
v) Jhandutta Range	Four One Three	-
vi) Naina Devi Wild Life Sanctuary	Four Five One	-

At present the wireless sytem is out of order in the division & the most effective mode of communication is mobile phones.Therefore the communication is through the mobile phones these days. The mobile phone allowances are prescribed to be paid to all the employees of the division to make the system more effective.

14.18.2 The following more wireless stations are required to be established to complete the network in this division.

i) Bharari Range Office

ii) Ghumarwin Range Office

iii) Kalol Range office

iv) Golthai Check Post

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CHAPTER – XV

MISCELLANEOUS RECORD

15.1 Control Forms: - control forms as prescribed in the Punjab Forest Leaflet No. 11 will be properly maintained and submitted in duplicate to the conservator of forests Working plan through the territorial Conservator of forests for scrutiny and counter signatures every year. Control forms will be maintained for the control of:

i) Fellings: - Standard control form 2(a) and 2(b) will be maintained.

ii) Subsidiary operations:- Control form 4 will be maintained

iii) Regeneration and Plantations works:- control form C will be maintained for all the regeneration and plantation areas. In view of the great stress laid on watching the progress of regeneration & plantations, the importance of proper maintenance of this form cannot be over emphasised.

15.2 Deviation Statement: - Summary of deviations requiring sanction of Pr. Chief Conservator of Forests will be submitted along with control forms on standard performa while submitting the deviation statements, the Divisional Forest Officer should give detailed explanation for the deviation, particularly with regards to the excess or the deficit removals and the progress of regeneration. These will be examined critically by the Conservator of Forests Working plan before obtaining the approval of the Pr. Chief Conservator of Forests.

15.3 Compartment History Files:- Compartment history files have been prepared in duplicate for the forests for use in Division as well as in Ranges. It is prescribed that the compartment history files will be properly maintained and posted upto date in April every year. Notes on important silvicultural operations marking, progress of regeneration and other cultural and subsidiary operations will be recorded in these files by the inspecting officers. During field tours and office inspections, the Divisional Forest Officer will ensure that the Compartment history files are properly maintained and are kept upto date. No separate plantation journals need to be maintained. The plantation works carried out will be recorded in the compartment history files. The success of plantation and other data collected as per prescriptions will be recorded along with necessary explanation for failures exceeding 10%. The results of regeneration survey will also be recorded during the year in which these are carried out.

15.4 Nursery Journals: - The nursery journals will be maintained to have a complete record about the origin of seed, date of sowings, germination, plant percentage and cost of the operations. At the end of the season, the cost of raising plants should be worked out separately for the plants raised in beds and in polythene bags.

15.5 Fire Record: _ A compete record of fires will be maintained both in the Range and Divisional Offices. Maps of the forests showing the area burnt by fire will be filled in the

Compartment history files along with other relevant data regarding the fire.

15.6 Divisional Note Book: _ Divisional Forest officer will maintain a proper record of

- ✓ Sale rates of different category of forests and Resin blazes.
- ✓ Outturn from lots sold or handed over to HPSFC in different years.
- ✓ Notes on the species tried and Success achieved indifferent plantation areas.
- ✓ Results of the soil conservation measures adopted in different soil conservation areas.
- ✓ Results of experiments conducted if any.
- ✓ Record of seed years.
- ✓ Any other important information regarding divisional working. This record should be maintained on forms to be prescribed by the territorial Conservator of Forests. At present Divisional note book is not being maintained in Bilaspur Division.

15.7 Forest Guard Beat Manual: - The information pertaining to the boundaries of forests, included cultivation, record of rights, planting, soil conservation and other silvicultural operations should be entered in the Forests Guard Beat Manuals supplied to the Forest Guards for the purpose. The undemarcated protected forests, which have been brought under systematic management under this plan, should also be entered in the Forest Guard Beat Manuals and all the above information should be maintained in respect of these areas also. The Divisional Forest Officer will check these manuals during his tour and will ensure that these are maintained properly. At present every Beat Guard has been provided with beat manual.

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CHAPTER – XVI

ESTABLISHMENT AND LABOUR

16.1 Establishment: - There will be extra workload with the implementation of the prescriptions of this working plan. Sufficient staff has to be posted in the field as well as in the offices. Atleast two Van Thanas are required to be opened in this division with special staff as new posts of atleast five forest Guards two Deputy Rangers in each Van thana. At present one Van Thana has been opend in Bassi but no staff has been provided to this Van Thana and staff of territorial beats and blocks are handling the work of this Thana. The exclusive posting of Van Thana staff is prescribed for smooth functioning of Van Thana and strengthening the protection machinery of the deptt. For territiral beats, blocks and ranges the organisation of 6 Ranges, 20 Blocks and 72 Beats will be sufficient to cope with the work load at the current level. One Range Assistant to be provided as a special duty forest Guard/Range Clerk in each range of the division to assist and strengthen the office working at range level. The details of the organisation set up has been given in appendix G.

16.2 Labour:- Inspite of all round developmental activities of P.W.D., B.B.M.B and industries like cement plants, the local labour is available for the forest operations except in the sowing and harvesting season of agricultural crops. During the working season local labour is supplemented by outside labour.

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भारत सरकार
पर्यावरण एवं वन मंत्रालय
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MINISTRY OF ENVIRONMENT & FOREST

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DAKSHIN MARG, CHANDIGARH-160030

F.No.13-7 (1)/1997-ROC/1260

Dated: 19th July, 2012

To

The Principal Secretary (Forests)
Government of Himachal Pradesh
Forest Department,
Tutlaul, Shimla, Himachal Pradesh.

Sub: Approval of Working Plan for the forests of Bilaspur Forest Division (2012-2013 to 2026-2027) written by Shri D.R. Kaushal, IFS -reg.

Ref: Pr. Chief Conservator of Forests, Govt. of Himachal Pradesh letter No.766 dated 10/07/2012.

Sir,

The Working Plan for the forests of **Bilaspur Forest Division** (2012-2013 to 2026-2027) has been examined in accordance with the provisions of Forest (Conservation) Act, 1980 as amended till date, National Working Plan Code, guidelines issued by Government of India, Ministry of Environment and Forests, New Delhi from time to time, National Forest Policy 1988 as well as orders dated 12th December 1996 of Hon'ble Supreme Court of India in WP(W)No.1202 of 1995 read with W.P(C) 171 of 1996.

After careful consideration of the proposed Working Plan, approval of the Competent Authority is hereby conveyed under Section 2 of the Forest (Conservation) Act, 1980 subject to observance of the following conditions :-

1. The approval shall be effective from the date of issuance of this communication till 31.03.2027.
2. All the provisions of the Forest (Conservation) Act, 1980 and various Rules & Guidelines issued under the Act shall be strictly enforced.
3. Yield obtained from dead, dry & salvaged timber will form part of prescribed yield and in case prescribed yield has been achieved from dead & dry volume, no further felling will be carried out. Yield from dead, dry & salvaged timber must not exceed the prescribed yield in the working plan.
4. All the fellings must commensurate with regeneration and no fellings would be permitted unless funds for regeneration are available. In this regard, orders of Hon'ble Supreme Court of India will be strictly complied with.
5. Working Plan is technically approved. However, felling in forests will be undertaken only as per orders dated 12.12.1996 of Hon'ble Supreme Court of India in CWP No. 202 of 1995 with CWP No. 171/1995 and / or any other order of Hon'ble Supreme Court of India or any other Court as applicable.
6. Intensive protection measures against fire, biotic interference and encroachment in forests shall be taken up.

Contd.....2/-

2. All the prescriptions proposed in the ... the forest area will be strictly followed and any change in the prescriptions will be made ... which prior approval of competent authority will be obtained.
3. Sufficient budgetary allocations be ensured for timely implementation of various prescriptions regarding protection, regeneration and development of the forests.
4. Mid term review of the Working Plan will be taken up in 2019-2020.
5. The work on revision of Working Plan shall be taken up well in advance so that the revised plan is ready before expiry of the current Working Plan.

The Central Government reserves the right to rescind/modify or withdraw this approval at any point of time depending upon the management needs and any other guidelines of the Ministry of Environment and Forests, Government of India or Hon'ble Supreme Court of India.

Yours faithfully,

(S.K. Srivastava)
I/c Addl. Principal Chief Conservator of Forests (Central)

Copy to:
1. The Addl. Director General of Forests (FC), Ministry of Environment & Forests, Paryavaran Bhawan, CGO Complex, New Delhi.
2. The Pr. Chief Conservator of Forests, Govt. of Himachal Pradesh, Forest Department, Tutikandi, Shimla, Himachal Pradesh.
3. The Additional Pr. Chief Conservator of Forests, Working Plan & Settlement Mandi, Himachal Pradesh.
4. The Divisional Forest Officer cum Working Plan Officer, Forest Division and District Bilaspur, Himachal Pradesh.
5. Guard file.