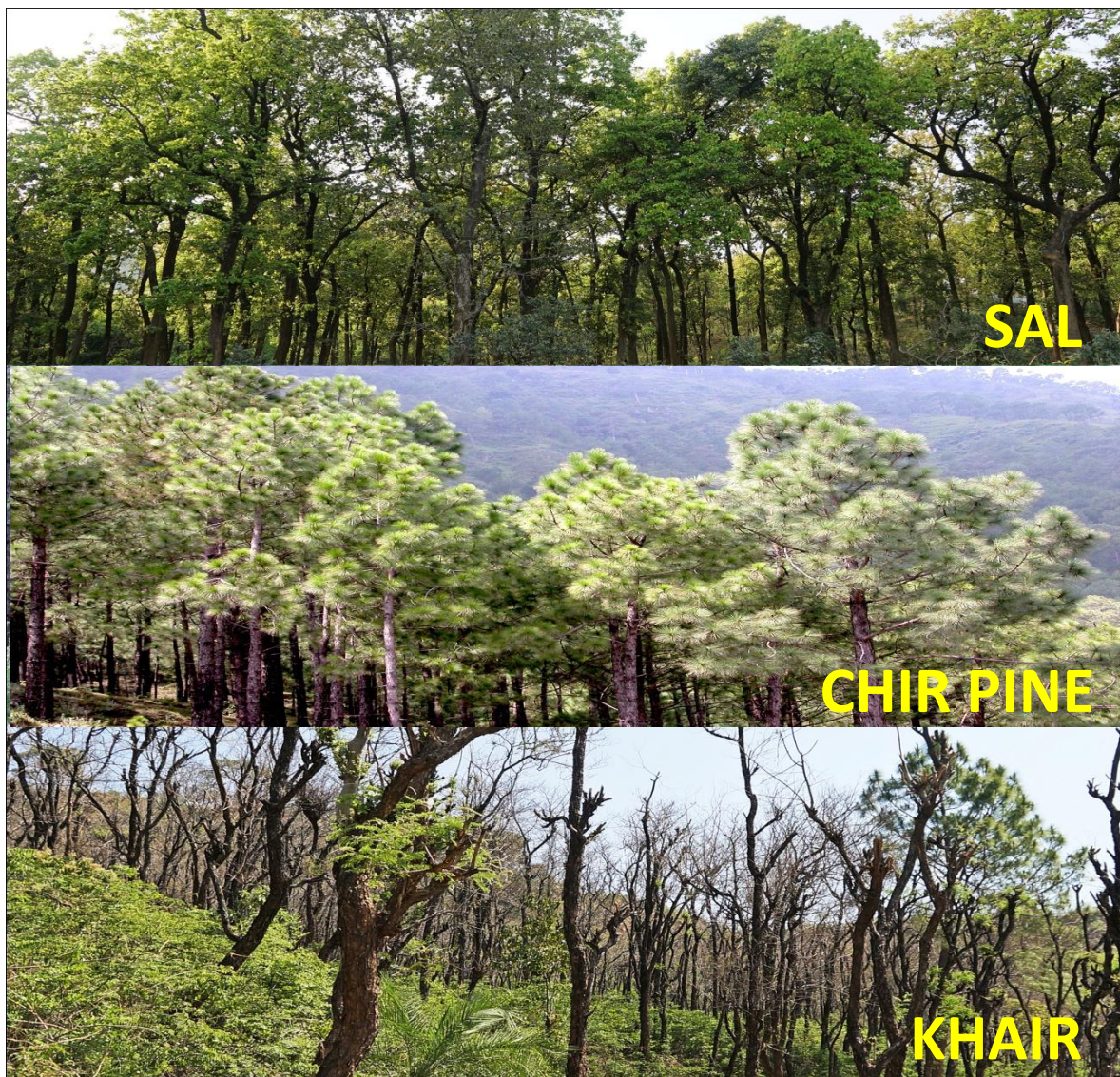


**FIRST SIX MONTHLY REPORT OF THE  
MONITORING COMMITTEE CONSTITUTED  
BY HON'BLE SUPREME COURT  
VOLUME-1**



**RELATING TO INTERLOCUTORY  
APPLICATION NO 3840 OF 2014  
IN WRIT PETITION (CIVIL) NO. 202 OF 1995  
(UNDER ARTICLE 32 OF  
THE CONSTITUTION OF INDIA)**

**15 AUGUST 2018**

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## ACRONYMS

<b>ACF</b>	Assistant Conservator of Forests
<b>A.N.</b>	Afternoon
<b>APCCF</b>	Additional Principal Chief Conservator of Forests
<b>CEC</b>	Central Empowered Committee
<b>CF</b>	Conservator of Forests
<b>cm</b>	Centimeter
<b>Comptt.</b>	Forest Compartment
<b>dbh</b>	Diameter at breast height
<b>DFO</b>	Divisional Forest Officer
<b>FCA</b>	The Forest (Conservation) Act, 1980
<b>F.N.</b>	Forenoon
<b>FSI</b>	Forest Survey of India
<b>ha</b>	Hectare
<b>GPS</b>	Geographical Positioning System
<b>GIS</b>	Geographical Information System
<b>GEOMATICS</b>	Remote Sensing, GIS and GPS
<b>HPFD</b>	Himachal Pradesh Forest Department
<b>HPFS</b>	Himachal Pradesh Forest Service
<b>HPSFC</b>	Himachal Pradesh State Forest Corporation.
<b>HOFF</b>	Head of Forest Force
<b>Kokath</b>	Miscellaneous broad leaved species
<b>m</b>	Metre
<b>MDF</b>	Moderately dense forest canopy density between 40 - 70%

<b>MIS</b>	Management Information System
<b>MoEF&amp;CC</b>	Ministry of Environment, Forests and Climate Change, Government of India
<b>MSL</b>	Mean Sea Level
<b>NGT</b>	National Green Tribunal.
<b>OB</b>	Over bark
<b>OF</b>	Open forest canopy density 10 to 40%
<b>PB</b>	Periodic Block
<b>PCCF</b>	Principal Chief Conservator of Forests
<b>RCC</b>	Reinforced cement concrete
<b>SC</b>	Supreme Court
<b>SOI</b>	Survey of India
<b>TOR</b>	Terms of Reference
<b>VDF</b>	Very dense forest canopy density of 70% and above
<b>WP</b>	Working Plan

## **ACKNOWLEDGEMENTS**

The Committee fully recognizes the confidence reposed by the Hon'ble Supreme Court in us for supervising and monitoring the entire programme of Experimental Silvicultural Fellings in three selected Forest Ranges in Himachal Pradesh for two years, by providing collaborative guidance to Himachal Pradesh Forest Department (HPFD) for facilitating this challenging professional work.

In bringing this Report together, we followed a structured consultative process involving extensive meetings at all levels of HPFD, thorough examination of relevant documents, followed by field inspections for ground verification to have first-hand assessment of the present state of forests and putting in place a new regulatory framework specially tailored to ensure compliance of prescribed safeguards for field activities.

The Committee would like to thank functionaries of HPFD at all levels lead by Shri Ajay Sharma IFS, PCCF, Head of Forest Force, (HOFF), for supply of relevant information promptly, facilitating field inspections and follow new guidelines for execution of the programme.

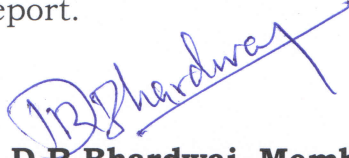
In particular, the Committee would like to place on record excellent professional support extended by the following individuals:

- Shri A R M Reddy IFS, Additional PCCF, Information Technology (IT), Wing, Shimla for his technical assistance all through in identifying and selection of Regeneration plots by interpreting the forest cover densities of Forest Survey of India, and validating

these with actual field conditions, by application of latest available Geo-Informatics.

- Shri B.D. Suyal IFS, Managing Director, HP State Forest Corporation, for helping us to evolve Criteria for selection of Regeneration plots.
- Shri P.L.Chauhan IFS, Additional PCCF, Working Plans, Mandi in finalizing new Guidelines for carrying out 100% Enumerations and Marking Rules.
- Shri D.R. Kaushal IFS, Conservator of Forest, Dharamsala Circle, for assisting us all through our site inspections and providing valuable inputs on practical field realities.
- Shri Om Prakash Chandel, HPFS, ACF, for his technical assistance to finalize the Report.
- Shri Rajneesh Kumar, Senior Scientific Professional, GIS Lab. and Shri Vishnu Sharma Videographer for assisting us tirelessly in our field inspections, digital mapping and videography recordings.
- Shri Rakesh Kumar Shurta, Senior System Analyst, Information Technology, for his able assistance in providing technical inputs for formatting and finalization of this Report.

  
**V. P. Mohan, Chairman.**

  
**Dr. D.R. Bhardwaj, Member.**

**15<sup>th</sup> August 2018**

**INTERLOCUTORY APPLICATION NO 3840 OF 2014 IN WRIT PETITION  
(CIVIL) NO 202 OF 1995-FIRST SIX MONTHLY REPORT -15 AUGUST 2018**



## **EXECUTIVE SUMMARY**

The report addresses all the directions stipulated in orders dated 16th February 2018 of Hon'ble Supreme Court, in case relating to **Interlocutory Application No 3840 of 2014** (Application on behalf of State of Himachal Pradesh for carrying out Silviculture Felling of trees) in **Writ Petition (Civil) No. 202 of 1995** (under Article 32 of the Constitution of India) hereinafter called our Terms of Reference (TOR). The First Six Monthly Report summarizes our initial work of understanding, planning and laying down the broad parameters for monitoring and supervising this Experimental Silvicultural Fellings work for two years and more specifically our preparatory work from 16th February 2018 to 15th August 2018. The objectives of the work have been to elucidate:

- How all stipulations and safeguards laid down in TOR have been **administered** in a synchronized manner.
- How an enabling and facilitating regulatory **framework** has been put in place for achieving the intended key objective of this Experimental Silvicultural Fellings work -- (To see whether Silviculture felling actually helps in the regeneration of forests or not).
- What **mechanisms** have been evolved to carry out **Operational Monitoring** by field inspections to ensure compliance of all stipulations at the initial stage and for eventual **Strategic Monitoring** to evaluate the overall success of this Experimental work for two years.

**Status of Approvals:** The Monitoring Committee has approved

Regeneration plots strictly in conformity with CEC recommendation xi on page 5 of TOR, restricting the size of each plot to 20 ha, The total forest area approved by Hon'ble Supreme Court in three Forest Ranges during 2018-19 is 1128.20 hectares of 32 compartments, out of which 31 (19 plus 12) Regeneration plots comprising an area of 542.92 hectares **(48%)** have been approved, with geo-referencing and digital maps by the Monitoring Committee as summarized in the following table:

FOREST RANGE	NURPUR	PAONTA	BHARARI	TOTAL AREA
SPECIES	KHAIR	SAL	CHIL	
AREA IN HECTARES				
1. 2018-19 APPROVED AREAS BY HON’BLE SUPREME COURT	903.14	176.01	49.05	1128.20
2. APPROVED REGENERATION PLOTS BY MONITORING COMMITTEE	12	4	3	19
3. REGENERATION PLOTS AREAS 2018-19	216.48 (24 %)	68.57 (39 %)	45.85 (93%)	330.90 (29 %)
4. REGENERATION PLOTS AREAS FOR 2019-20- LANTANA INFESTED	12 215.02 (24 %)	NIL	NIL	12 215.04
5. TOTAL AREA APPROVED BY MONITORING COMMITTEE	431.50 (48%)	68.57 (39 %)	45.85 (93%)	545.94 (48%)
6. LEFT OUT AREAS	471.64 472	107.44 107	3.20 3	582.28 582

The latest status of compliance as on 15th August 2018, in respect of each stipulation is summarized in (**Annexure 1.3**) under the following five broad groupings:

1. *Cited Orders of Hon'ble Supreme Court*
2. *Binding Regulatory Pre requisites for Experimental Silvicultural Felling*
3. *Species Specific Stipulations ; Khair, Chil, Sal and Eucalyptus*
4. *Adequate Budgetary Provision for Reafforestation*
5. *Ensuring Enabling Conditions for Regeneration*

### **Recommendations:**

Based on our first hand feedback from our field inspections and suggestions of front line staff, it has become incumbent on us to elucidate our following **three Recommendations** which merit consideration and further directions from Hon'ble Supreme Court in the overall context of putting in place a professionally sound forest management regime incorporating a package of best practices for sustainable management of valuable forests of Himachal Pradesh.

### **FIRST RECOMMENDATION: COMPARTMENT TO BE A UNIT OF MANAGEMENT-TREATMENT OF LEFT OVER AREAS OF 2018-19 IN 2019-20**

The overall status of left over compartment areas is summarized as follows:

<b>FOREST RANGE SPECIES</b>	<b>NURPUR KHAIR</b>	<b>PAONTA SAL</b>	<b>BHARARI CHIL</b>	<b>TOTAL</b>
<b>LEFT OUT AREAS OF 2018- 19</b>	472	107	3	<b>582</b>

(Table 2.2)				
<b>AREAS APPROVED FOR WORKING IN 2019-20</b>	706	120	24	<b>850</b>
<b>TOTAL WORKLOAD FOR 2019-20</b>	<b>1178</b>	<b>227</b>	<b>27</b>	<b>1432</b>

The Monitoring Committee recommends that in order to ensure that Experimental Silvicultural Fellings and thinning for these two years are carried out holistically as warranted professionally and technically, the left out areas of 2018-19 i.e. 582 ha. be taken up in 2019-20 along with approved areas of 850 ha. for next year i.e. 2019-20. The total area of each compartment approved for treatment should be gone over in a single year, taking it as a unit of working and treatment should not be limited to 20 ha.

## **SECOND RECOMMENDATION: APPROVAL OF FELLING IN EUCALYPTUS FORESTS**

The Monitoring Committee has noticed that recommendation number (iii) of CEC on page 4 of orders by Hon'ble Supreme Court reads as follows:

**4. iii) 764 ha. of Eucalyptus trees proposed for felling as per Working Plan prescriptions be permitted to be felled and the same area regenerated with native broadleaved species;**

The Monitoring Committee recommends that on an experimental basis, 50 ha. of Eucalyptus (10 ha. in Paonta Forest Division and 40 ha. in Nahan Forest Division) may be approved for felling during



2018-19. Felling of the Eucalyptus is to be completed before 15th January 2019.

### **THIRD RECOMMENDATION: APPROVAL FOR REVIVAL OF SOUND FOREST MANAGEMENT PRACTICES IN HIMACHAL FORESTS**

The Monitoring Committee recommends that to maintain healthy, young and biodiversity rich forests, it is necessary to allow revival of prescribed silvicultural operations like cleaning, thinning and salvage of dead, dry trees as well as subsidiary silvicultural operations, like control burning for disposal of slash following other scientific prescriptions given in the approved Working Plans. Certainly, these operations will need adequate budgetary provision under a definite budget head titled **“Subsidiary Silvicultural Operations”**. These operations will also improve rural livelihoods for the Village Forest Development Societies and participation of local people should be sought while implementing these field activities

Considering that the proposed silvicultural operations will get revived after a long gap, the implementation of these operations in the field will certainly need a revamped system of Mandatory Monitoring through field verifications by hierarchy at senior level to ensure strict compliance of the intended interventions.

#### **Next Steps:**

In order to ensure that the implementation of strict regulatory stipulations as laid down by Hon'ble Supreme Court for this entire programme of Experimental Silvicultural Fellings are first correctly understood and efficiently implemented at the cutting edge level with the required professional knowledge and training, the Monitoring Committee had requested the State Government for two interventions

as follows:

1. Posting of IFS officers in Cadre Forest Divisions of Nurpur and Paonta, there being already an IFS officer in Bilaspur Forest Division. Finally posting orders have been issued and we have in position three IFS officers manning these Forest Divisions where work is to be monitored by us for two years.
2. Likewise in three selected Forest Ranges of Nurpur, Bharari and Paonta, Range officers should be directly recruited Rangers and not promoted incumbents, so that professional aspects of the work are not compromised.

## PART ONE – BACKGROUND

### 1.1 TERMS OF REFERENCE

The report addresses all the directions stipulated in orders dated 16th February 2018 of Hon'ble Supreme Court, in case relating to **Interlocutory Application No 3840 of 2014** (Application on behalf of State of Himachal Pradesh for carrying out Silviculture Felling of trees) in Writ Petition (Civil) No. 202 of 1995 (under Article 32 of the Constitution of India) hereinafter called our Terms of Reference (TOR) **(Annexure 1.1)**

However, for easy reference a tabulated summary of Terms of Reference (TOR) has been developed by arranging thematically inter-related orders of Hon'ble Supreme Court and recommendations of CEC at one place in **(Annexure 1.3)**. As an example, all stipulations on Khair either by Hon'ble Supreme Court or CEC can be seen at one place under main part 3 titled Species Specific Stipulations and sub part one relates to Khair. This tabular format is a checklist and would form an essential part of our every Six Monthly Report to easily monitor the status of action taken and updated pace of compliance of each stipulation. It will also facilitate easy linkages with the main report.

Based on theme wise categorization of a range of stipulations, following five broad parts have been adopted for arranging various stipulations: (See Box 1.1)

### Box 1.1 Five Broad Parts of TOR

1. *Cited Orders of Hon'ble Supreme Court*
2. *Binding Regulatory Prerequisites for Experimental Silvicultural Felling*
3. *Species Specific Stipulations; Khair, Chil, Sal and Eucalyptus*
4. *Adequate Budgetary Provision for Reafforestation*

The First Six Monthly Report summarizes our initial work of understanding, planning and laying down the broad parameters for monitoring and supervising this Experimental Silvicultural Fellings work for two years and more specifically our preparatory work from 16th February 2018 to 15th August 2018. The objectives of the work have been to elucidate:

- ❖ How all stipulations and safeguards laid down in TOR have been **administered** in a synchronized manner.
- ❖ How an enabling and facilitating **regulatory framework** has been put in place for achieving the intended key objective of this Experimental Silvicultural Fellings work -- (To see whether Silviculture felling actually helps in the regeneration of forests or not).
- ❖ What **mechanisms** have been evolved to carry out **Operational Monitoring** by field inspections to ensure compliance of all stipulations at the initial stage and for eventual **Strategic Monitoring** to evaluate the overall success of this Experimental work for two years.



## 1.2 PROCESS AND METHODOLOGY

The chronology of completing the task comprised a thorough examination of all relevant documents, preparatory meetings at Shimla, followed by field inspection and validation meetings as summarized in **(Annexure 1.4)**

The completion of a work of this nature undoubtedly had the challenge of drawing together the vast and scattered range of information in various approvals and other related documents as given in **(Annexure 1.5)**

Recognizing the need for meeting a dead line for this work, the Committee had to conceptualize a consultative and analytical process and follow a time bound work plan as given in **(Annexure 1.6)**. The details of Process and Methodology are given in Part 2.1.1.D. The sequence of inter related activities gone through is as follows:

**1.2.1 Conceptualization of the Task:** Preparatory planning meetings at Shimla were arranged in order to develop an approach and establish clarity relating to the intended purpose of the task requiring systematic collection of information at macro and micro level for eventual finalization of the report.

**1.2.2 Finalization of Format for Collating Factual Information:** The Committee decided right at the initial stage that in order to respond to the Terms of Reference **(Annexure 1.1)** in a meaningful and holistic way, all interrelated issues should be tabulated thematically in **(Annexure 1.3)**

**1.2.3 Field Level Consultations for Sharing the Process and Methodology:** In order to create awareness relating to Experimental

Silviculture Fellings in HP and get feedback about our approach to monitor this work, presentations were planned in Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh, on 21st April 2018 and in Forest Training Institute for Forest Rangers on 28th May 2018.

### **1. 3 APPROACH ADOPTED FOR REPORTING**

An effort has been made to adopt an easily understandable format for our reporting. Therefore, the Monitoring Committee has kept in mind the underlying concern of Hon'ble Supreme Court, while permitting Experimental Silviculture Felling that all safeguards need very close monitoring. Thus, we have supervised and rendered guidance all through as per our mandate in accordance with the following order on page 11 paragraph 9.8 (**Annexure 1.1**): (See Box 1.2)

#### **Box 1.2 Mandate of the Monitoring Committee**

- *“This entire programme of experimental silviculture felling shall be done under the supervision and guidance of a two-Member Committee headed by Shri V.P. Mohan, IFS (Retd.), former Principal Chief Conservator of Forests, Himachal Pradesh. The second member of this Committee shall be nominated by the Vice Chancellor, Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh. The second Member shall be a Professor of Silviculture.*
- *The Committee should submit its report to this Court every 6 months.*

In the above context, an endeavour has been made to systematically synthesize in this first Six Monthly Report a web of technical issues and to present a holistic assessment how this programme of Experimental Silviculture Fellings has been initiated and planned as a Project to be implemented for two years with all precautionary stipulations and safeguards after a phase of dormancy for almost 24 years, because of ban on green felling.

#### **1.4 STRUCTURE OF THE REPORT**

Undoubtedly, the orders of Hon'ble Supreme Court required a professional analysis of various inter related issues in a systematic manner. Accordingly, the Report includes extensive cross referencing to provide easy linkages and inclusion of figures, tables and boxes for text in the main Report was deemed necessary to highlight key professional issues picked up for special attention. The Report is structured as follows:

**Volume 1** comprises the main text of the report and contains mainly synthesis of findings, and three Maps.

The text is arranged in three parts:

**Part One** contains background information.

**Part Two** contains the main report on the orders of Hon'ble Supreme Court dated 16th February 2018.

**Part Three** contains recommendations and next steps.

**Volume II** contains all Annexure(s) having detailed information as collated during the period under report and thereafter systematically analyzed and tabulated for linkages with the main report.

In addition to **four hard copies** being submitted in two Volumes to

Hon'ble Supreme Court, a soft copy of the Report is being emailed to Shri Ram Kumar Choubey, Registrar, Hon'ble Supreme Court.

Video recordings of two Consultative Meetings and site inspections of forests and nurseries of three selected Forest Ranges is being submitted along with the First Six Monthly Report, arranged in the following manner:

**DVD 1:** Consultative Meetings 1& 2

Inspections of Bharari and Paonta Forest Ranges

**DVD 2:** Inspections of Nurpur Forest Range

KML files of 18 Regeneration plots and three Maps

It may be clarified that hard copies of the Report will be circulated to the State Government and concerned HPFD offices (HOFF, concerned Conservators, DFOs and Forest Range Officers) for follow up action and compliance after appropriate orders of Hon'ble Supreme Court on our Recommendations.



## **PART TWO - REPORT ON ORDERS OF HON'BLE SUPREME COURT DATED 16th FEBRUARY 2018**

### **2.1 TECHNICAL ISSUES REQUIRING ELABORATION**

#### **2.1.1 Project Management Framework**

Keeping in view the need to address technical complexities of this entire programme of Experimental Silviculture Felling spread over two years in a continuing sequence, the Monitoring Committee has deemed it advisable to oversee and monitor this challenging task in a Project mode. Therefore, a Project Management Framework has been put in place having the following key activities:

**A. Administering Monitoring Process:**At the very outset, the Monitoring Committee undertook a comprehensive in depth analysis of our TOR having 12 pages, with very precise stipulations, including recommendations i to xvi of Central Empowered Committee (CEC), in order to conceptualize our scope of work very clearly and evolve a robust administering process to ensure compliance of all stipulations and safeguards by Himachal Pradesh Forest Department (HPFD) under the guidance and supervision of the Monitoring Committee. Monitoring will be integrated into all stages of the project cycle.

**B. Regulatory Framework:** Our endeavour had been to follow an analytical approach to develop a Regulatory framework for effective monitoring but suitably adjusted to cater to stage wise interventions in this professional task of executing Experimental Silvicultural Fellings for two years.This approach has involved progressive updating of Analytical Frameworks, refinement of practical aspects of

our options and “testing” of proposed stipulations and prescriptions with ground realities. This analytical, management intensive and consultative process has provided a better understanding and linkages between various technical issues. It is expected to serve as a baseline template for subsequent reporting as more field operations are gone over and findings are updated for seeking further directions of Hon’ble Supreme Court.

**C. Three Stage Process:** A Three Stage Process has been developed for stage wise supervision and for providing guidance to address all inter-related legal stipulations and professional parameters as follows:

**STAGE ONE: CONCEPTUALIZATION OF THE TASK-SCOPING OF ISSUES-DEFINING APPROACH**

As a first step to take up this work, the Monitoring Committee had planned two in-house Consultative Meetings with HPFD (Videography done)

- **1st March 2018**- Shared with HPFD an elaborate Analytical Framework incorporating stipulations and safeguards of Hon’ble Supreme Court and CEC in order to address holistically all technical and legal matters for conceptualization of the task. The latest version of the Analytical Framework can be seen as **(Annexure 1.3)**
- **12th March 2018**- In this meeting, the Committee had detailed consultations with HPFD on the following items:
  1. Information gaps of Analytical Framework were pointed out and answers sought to move forward.

2. Clarifications received from CEC (**Annexure 1.2**) were shared with all participants in order to take action as warranted in respect of each issue.

## **STAGE TWO: FAMILIARIZATION SITE INSPECTIONS BY COMMITTEE**

The Monitoring Committee has already completed site inspections of Khair, Chil and Sal forests in three selected Forest Ranges as per areas approved by Hon'ble Supreme Court. An abstract of all 31 approved Regeneration plots forms (**Annexure 2.2**)

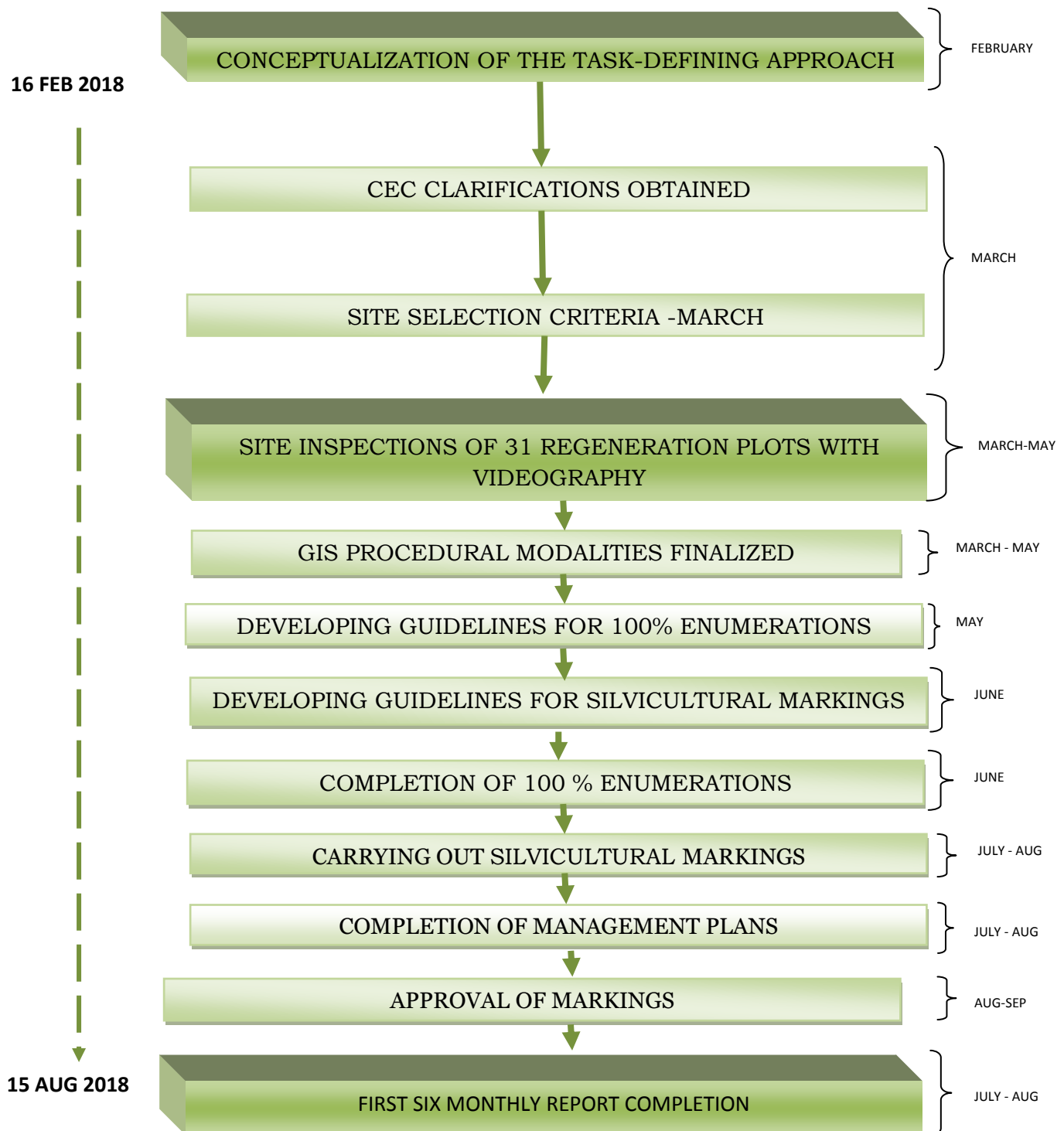
## **STAGE THREE: POST MARKINGS INSPECTION BEFORE HANDING OVER LOTS TO HPSFC**

Silvicultural Markings are being done and will be inspected and checked by senior Forest Officers at the first stage. The Monitoring Committee will finally approve these markings before 15th September 2018 and thereafter these forests will be handed over to Himachal Pradesh State Forest Corporation (HPSFC) for carrying out fellings.

The process has to continue on a regular basis during the duration of this Experimental work for 2018-19 and 2019-20 and the second six monthly Work Plan from August 2018 to February 2019 will be finalized in second fortnight of August 2018.

**D. Work Plan from February to August 2018:** The full process and time table is outlined in (**Annexure 1.6**) and is being summarized in Figure 2.1 giving at a glance the pace of completion of major sequential activities in first six months.

**Figure2.1: Flowchart of Key Activities.**





### **2.1.2 Clarifications from Central Empowered Committee (CEC)**

During our First Consultative Meeting with HPFD on 1st March 2018, it became very evident that before initiating our technical work, there was a need to seek clarifications from CEC in respect of its few recommendations under paragraph 4, pages 4 and 5 of TOR **(Annexure 1.1)**. Accordingly, a meeting was fixed with Shri Amarnatha Shetty, Member Secretary, CEC in Delhi on 8th March 2018, and issues requiring clarifications were discussed. Minutes of these discussions are given in **(Annexure 1.2)**. During the first six months, the experimental work has been strictly regulated as per the above-referred clarifications from CEC and the latest status of action taken on each clarification is tabulated in **(Annexure 1.3)**.

A gist of clarifications is as follows:

- **CEC Page 5 (x)** This condition of retaining 50 healthy trees per ha. may not be insisted upon for 2018-19 markings. This condition of advance marking of mother trees was imposed by CEC considering the large scale lopping of Khair trees observed during the field visit.
- **CEC Page 5 (xi)** It is clarified that the unit size of area to be taken up for regeneration felling in a given compartment in a year shall not exceed 20 hectares.
- **CEC Page 5 (xii)** If the compartment is more than 20 hectares, it can be divided into two or more sub-units so as to avoid creation of large gaps in the forest canopy in a given location. During the discussion it has been clarified that the entire block of 903.4 hectares in Khair Working Circle cannot be taken up

for silvicultural felling during 2018-19.

- **CEC Page 5 (xv)** The Management Plan for the three species namely Khair, Chil and Sal be prepared for the entire Forest Division in which the felling has been approved by Hon'ble Supreme Court. However the execution of the plan be limited to the forest areas that have been reported by the State Government vide their affidavit dated 13th December 2017 and areas proposed have been approved by Hon'ble Supreme Court. Therefore, while preparing the Management Plan, the Forest Department of Himachal Pradesh shall keep in mind recommendation No (xi) and (xii) of CEC Report.

### **2.1.3 Introduction of Site Selection Criteria for Approval of Regeneration Plot-(Annexure 2.1)**

Keeping in view the aforementioned clarifications from CEC, the Monitoring Committee in consultation with HPFD evolved a Data Sheet and technically named it as Criteria for Selection of a Regeneration Plot of 20 ha. from a compartment having area more than 20 ha. Criteria included for identification and selection were basic data on locality factors, year in which it was prescribed for felling, stocking and regeneration factors, etc. As per our instructions, the territorial Conservator of Forests would brief the Monitoring Committee on the day of arrival firstly by showing prescribed Data Sheet for each selected Regeneration plot and selected plot roughly marked on a tracing of 1:15,000 map scale so that the Committee is satisfied that clarifications from CEC on conditions no xi) and xii) as given in TOR (**Annexure 1.1**) have been complied while selecting

Regeneration plot in each Compartment approved for felling in 2018-19. With this advance assessment, it became a lot easier to move into the field and do ground verification more effectively and then accord approval and lay down instructions which are video graphed for each Regeneration plot.

#### **2.1.4 Application of GIS Technology/ Geomatics (Remote Sensing, GIS and GPS)**

At the very initial stage of planning this programme of Experimental Silvicultural Fellings, the Monitoring Committee recognized the urgency of putting in place a very transparent and workable methodology of monitoring on a long term basis to assess realistically whether such felling actually helps in the regeneration of forests or not. Accordingly in consultation with in house Geographical Information System (GIS) Laboratory, headed by Shri A.R.M. Reddy, Additional Principal CCF (IT/GIS/MIS) and Aryabhata Geo-informatics and Space Application Centre, Shimla (AGiSAC), it was decided that ground verification of forests needs to be supplemented with recording of georeferences with the help of GPS tools followed by digitalization in GIS laboratory transforming the identified blocks on to GIS platform; and follow an accurate methodology to visualize the spatial distribution of the selected regeneration blocks vis-à-vis the forest compartments and its adjoining blocks selected, so as to comply with the stipulations laid down by the Hon'ble Supreme Court and CEC with regard to spacing and limiting size of selected plots. This will greatly help in long term monitoring of changes using time lines

on Google Earth imageries. Accordingly during ground verification inspections, following activities have been completed:

- Geo-referencing of Survey of India (SOI) topographical sheets on 1:15,000 scales has been done, depicting there in all 19 compartments approved for Experimental Silviculture Fellings during 2018-19 by Hon'ble Supreme Court. In addition, 12 Regeneration plots of Nurpur Forest Range N/13 to N/24 (215.02 ha) listed before the Committee for fellings during 2018-2019 will be inspected in October 2018 after complete Lantana eradication and thereafter geo-referencing will be got done.

**(Annexure 2.2)**

- On the basis of our field visits, 19 regeneration plots of area not more than 20 ha (Paonta P/1 to P/4, Bilaspur B/1 to B/3 and Nurpur N/1 to N/12) have been identified from these compartments and by using Geographical Positioning System (GPS), depicted these in the GIS platform for further monitoring, digitizing and geo-referencing the same using (SOI) topo sheets. In Nurpur Forest Range, the total area of Compartment C-1 Punder being 20.23 ha. , it was not advisable to restrict it to 20 ha. It is shown as Regeneration plot no N/2 in

**(Annexure 2.2)**

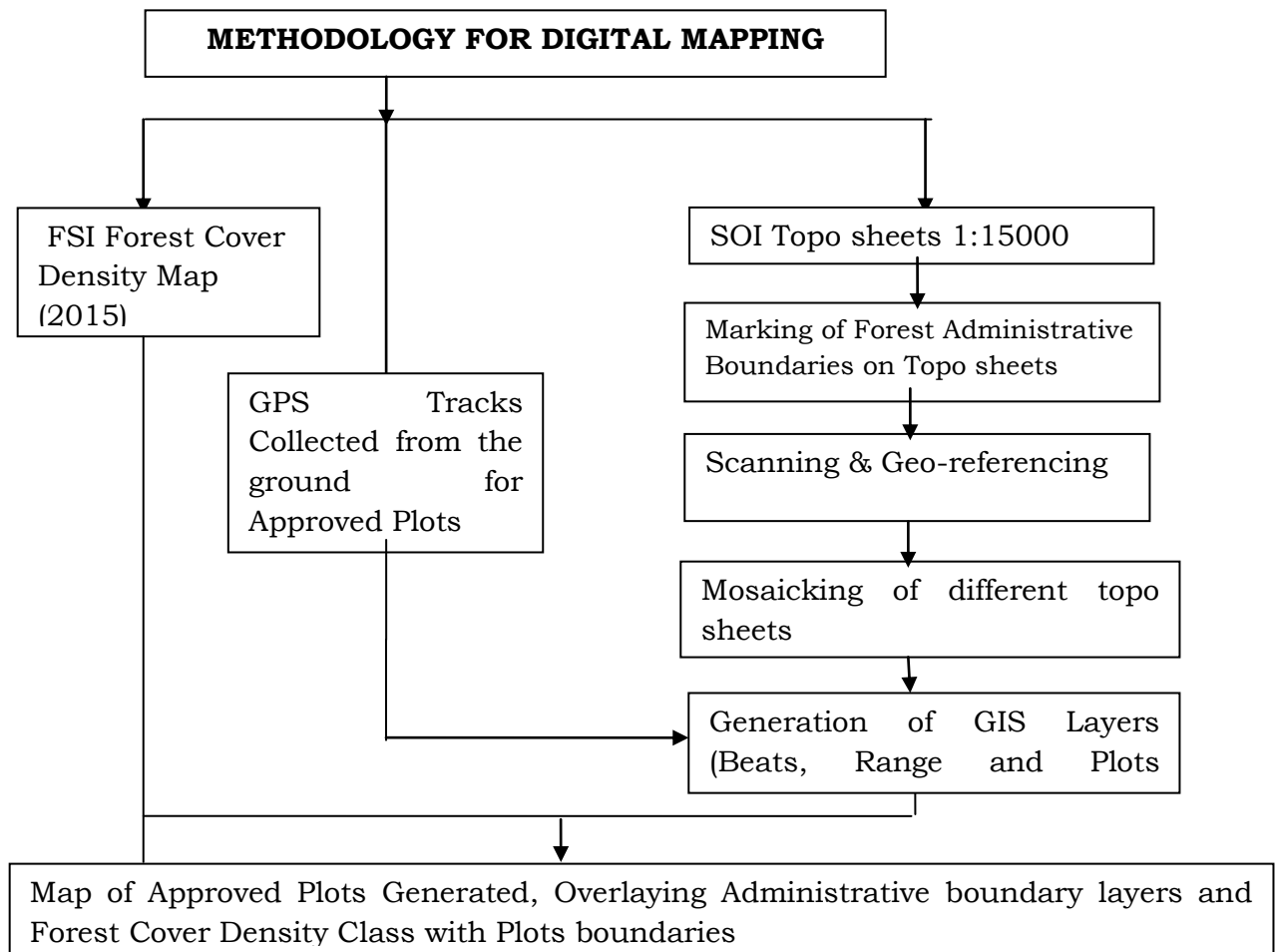
- The boundaries of all 19 forest compartments were superimposed on forest cover map of Forest Survey of India (FSI) 2015 to know the density classes of these compartments.
- Converted KML (Key Hole Mark-up Language) files (KML is a file format used to display geographic data in an Earth browser

such as Google Earth) are then overlaid in Google Earth platform to get the real time picture of location of compartments. Longitude and Latitude points of four corners of approved plots as given in **(Annexure 2.2)** can be used as reference points to locate the plots on the ground

- Actual field surveys were carried out to validate the compartment boundaries and forest densities with the densities arrived at in GIS laboratory.
- The proposed Regeneration plots can also be monitored by using multi temporal satellite data, to know how the forest cover has changed over a period of time in proposed plots i.e. how it was before felling and how it has changed after the silviculture felling and also how regeneration has progressed after a time gap of 5-10 years (only in terms of cover/density) when the regeneration reaches that stage.
- Undoubtedly making use of these GIS layers and using overlay analysis in GIS platform, will help in preparing better management plans of the forests being taken up for Experimental Silviculture felling.
- So far, the Department has been using only the Open Series Maps (OSM) of SOI to digitize its boundaries up to forest compartment level, after comparing them with Compartment History Files and consulting the Forest Guard of the beat. Work of ground validation of digitization carried out so far using the SOI Sheets is in progress.

Figure 2.2 given below illustrates the Methodology adopted for completing aforementioned activities:

**Figure 2.2: Methodology Adopted for Digital Mapping**



#### **2.1.5 Guidelines for Carrying out 100% Enumerations.**

##### **(Annexure 2.3)**

Following Binding Regulatory Pre-requisites were laid down by Hon'ble Supreme Court and CEC as given in TOR **(Annexure 1.1)** in so far as stipulations and safeguards relating to floristic composition offorests are to be put in place for eventual monitoring :( See Box 2.1)

### **Box 2.1 Safeguards for Mixed Species Forests**

**CEC Page 4(i)** *regeneration of the forests aimed at achieving mixed species forests with multi layered canopy having more efficient carbon sequestration capability*

**CEC Page 4(ii)** *no felling of broad leaved species be permitted in the compartments to be taken up for regeneration fellings*

**CEC Page 5 (xiv)** *no green fellings are to be carried out in steep slopes and along streams and nallas*

The Monitoring Committee went through the existing instructions for carrying out enumerations at the time of revision of Working Plan, and after laying down the broad parameters, felt it advisable to redraft self-contained guidelines after consultations with field officers through Video conference on 3rd May 2018 for carrying out 100 % enumerations in approved Regeneration plots in order to have an overall assessment of growing stock in standard diameter classes but more importantly floristic composition of each plot by going through the following procedure:

(See Box 2.2)



### **Box 2.2 Instructions for 100 % Enumerations of All Species**

*Apart from three main species namely Chil, Sal and Khair, all trees of 10 cm and above dbh (ob) ( Diameter above breast height over bark) of species which can be identified will be enumerated and given names and all other species which are not identifiable will be put under other Broad Leaved species/ Kokath. Species can also be identified by local name. Bamboos in terms of clump will be enumerated*

The total number of trees enumerated class wise and species wise and standing volume now obtained per hectare is being compared with corresponding previous volume figures as given in Compartment History Files at the time of revision of Working Plan, in order to assess how growing stock and floristic composition have changed over time. Enumeration results analysis so done will be used to carry out markings and reviewed thereafter. These guidelines being very detailed can be safely replicated eventually for silvicultural fellings on a larger scale.

#### **2.1.6 Guidelines for Carrying out Silvicultural Markings (Annexure 2.4)**

The Monitoring Committee has taken careful note of the following Species Specific Stipulations as laid down by Hon'ble Supreme Court and CEC in TOR (**Annexure 1.1**) in so far as stipulations about silvicultural removals are concerned. (See Box 2.3)

**Box 2.3 Safeguards Prescribed During Markings**

**SC 9.3** *The State shall ensure that at least 25% of mature Khair trees are retained as mother trees and these should be marked and numbered as trees not to be felled, which should be clearly reflected in the videography. The trees to be felled can be marked by a separate colour. The number, size and girth of the trees should be clearly spelt out*

The Monitoring Committee also went through the existing instructions for carrying out markings for salvage removals and marking of trees under The Forest (Conservation) Act, 1980. (See Box 2.4)

**Box 2.4 Instructions for Enumerations Under The Forest (Conservation) Act, 1980.**

*Species-wise and girth class-wise enumeration list and abstract of trees (Abstract to be given at the end of the list) standing on the forest area in question neat typed or computerized and duly signed by DFO.*

Keeping in view all the safeguards required to be complied with in this experimental work, action was taken to redraft self-contained guidelines after detailed consultations with field officers through Video conference on 18th June 2018. (See Box 2.5)

**Box 2.5 Safeguards for Compliance of Condition no 3 on  
Page 9 Annexure 1.1**

*vii) The colour coding for trees to be retained as mother trees will be **White paint** belt at breast height.*

*ix) The tree to be marked for **felling** will have a patch of 6"x4" by shaving the bark, above the soil level on the uphill side. This patch will be painted with **Black Japan**. The marking number will be engraved on this painted patch with iron chisel and marking hammer will also be affixed on this patch. The marking hammer will also be affixed at the breast height on the uphill side of the tree to be marked.*

These Guidelines will be tested in the field and if felt necessary, can be refined further. Silvicultural markings including thinning are being carried as per above Guidelines.

**2.1.7 Assessment of Availability of Tall Poly Bag Plants for Supplementing Natural Regeneration.**

The Monitoring Committee has already inspected nurseries in three selected Forest Ranges where Experimental Silviculture Felling work has been undertaken with a view to ensure compliance of the following stipulations in TOR (**Annexure 1.1**): (See Box 2.6)

**Box 2.6 Safeguards for Supplementing Natural Regeneration.**

**CEC-Page5.viii)** *Planting component in Assisted Natural Regeneration shall include more than 50% seedlings of native broad leaved and multipurpose use species other than that of the principal species;*

**SC-Page11.7.** *The State should also ensure that sufficient numbers of healthy saplings are planted so that there is proper regeneration of the forest .*

It may be underlined that during monsoon planting season in 2019, it is being ensured that only tall nursery plants of broad-leaved species raised in poly bags of 15x9 inches having minimum 4 feet height will be used for supplementing natural regeneration.

**2.1.8 Preparation of Three Management Plans.**

HPFD has already completed the process of making 3 Management Plans as initially stipulated in TOR (**Annexure 1.1**) as follows:

**CEC-Page 5. (xv)** State Government shall prepare three separate comprehensive management plans one each for Chil, Sal and Khair respectively covering the entire forest area falling below 1500 MSL incorporating revised set of prescriptions as detailed in this report as one time exercise. After obtaining approval of MoEF&CC, these plans will be integrated with the Working Plans of respective forest divisions for operational purposes

**CEC** has further clarified on 8th March 2018 as follows:

The Management Plan for the three species that is Khair, Chil and Sal be prepared for the entire Forest Division in which the felling has been approved by Hon'ble Supreme Court. However, the execution of the plan be limited to the forest areas that have been reported by the State Government vide their affidavit dated 13th December 2017 and areas proposed have been approved by Hon'ble Supreme Court. Therefore while preparing the Management Plan the Forest Department of Himachal Pradesh shall keep in mind recommendation No (xi) and (xii) of CEC Report.

Management Plans are being scrutinized before obtaining approval from MoEF&CC.

## **2.2 ANSWERS TO THE TERMS OF REFERENCE**

### **2.2.1 Quantitative Assessment of Workload of Experimental Silviculture Felling during 2018-19 and 2019-20**

An overall assessment of quantitative workload for two years in three selected Forest Ranges under Experimental Silviculture Fellings, species wise is summarized in the following table:

**Table 2.1 Workload of Experimental Silviculture Felling during 2018-19 and 2019-20.**

FOREST RANGE	NURPUR	PAONTA	BHARARI
SPECIES	KHAIR	SAL	CHIL
PARA OF APPROVAL (TOR)	PARA 7.6	PARA 8.8	PARA 7.7
2018-19 APPROVED AREAS BY HON'BLE SUPREME COURT	903.14	176.01	49.05
2019-20 APPROVED AREAS BY HON'BLE SUPREME COURT	706.30	120.12	23.95
TOTAL AREA	<b>1609.44</b>	<b>296.13</b>	<b>73.00</b>

### **2.2.2 Results of Inspections by the Monitoring Committee during 2018-19**

**A: Chronology of Site Inspections:** The Monitoring Committee has already completed site inspections of Khair, Chil and Sal forests in three selected Forest Ranges as per areas approved by Hon'ble Supreme Court as follows: (See Box 2.7)

#### **Box 2.7 Chronology of Site Inspections.**

*Nurpur Forest Range: 22-24 March 2018*

*Bharari Forest Range: 6-8 April 2018*

*Paonta Forest Range: 16-18 April 2018*

*Nurpur Forest Range: 22-26 April 2018*

*Nurpur Forest Range: 19 May 2018.*

**B: Videography:** Videography of each Regeneration plot covering our site inspections and according approval including laying down

instructions for the field staff was got done in the first stage i.e. **before felling** as stipulated in paragraph 9.2 page 9 of TOR (**Annexure 1.1**)  
Videography recordings have been arranged as follows:

**DVD 1:** Consultative Meetings 1& 2

Inspections of Bharari and Paonta Forest Ranges

**DVD 2:** Inspections of Nurpur Forest Range

KML files of 18 Regeneration plots and three Maps

For convenience of assessing the ground realities by Hon'ble Supreme Court, videography recordings follow exactly the sequence of numbering of each Regeneration plot as given in (**Annexure 2.2**), wherein each plot has been assigned a specific code number for three Forest Ranges as follows:

Nurpur Forest Range N/1 to N/12-2018-19 and N/13 to N/24 2018-19 for Red areas (Heavily infested with Lantana)

Paonta Forest Range P/1 to P/4 2018-19

Bharari Forest Range B/1 to B/3 2018-19.

Code numbering has been planned to facilitate eventual monitoring of pace of regeneration for each approved Regeneration plot.

**C: Summary of Inspection Results:** A summary of our inspections of 2018-19 areas and approvals of Regeneration plots is as follows:



**Table 2.2 Results of Inspections by Monitoring Committee During 2018-19.**

FOREST RANGE	NURPU R	PAONTA	BHARA RI	TOTAL  AREA
SPECIES	KHAIR	SAL	CHIL	
PARA (TOR)	PARA  7.6	PARA  8.8	PARA  7.7	
AREA IN HECTARES				
1.2018-19 APPROVED AREAS BY HON’BLE SUPREME COURT	903.14	176.01	49.05	1128.20
2. APPROVED REGENERATION PLOTS BY MONITORING COMMITTEE	12	4	3	19
3. REGENERATION PLOTS AREAS 2018-19	216.48 (24 %)	68.57 (39 %)	45.85 (93%)	330.90 (29 %)
4.REGENERATION PLOTS AREAS APPROVED FOR 2019-20 WORKING -LANTANA INFESTED	12  215.02 (24 %)	NIL	NIL	12  215.04
5.TOTAL AREA APPROVED BY MONITORING COMMITTEE	431.50 (48%)	68.57 (39 %)	45.85 (93%)	545.94 (48%)
6.LEFT OUT AREAS	471.64  472	107.44  107	3.20  3	582.28  582

**D: Key Findings:** The Monitoring Committee deems it appropriate to make a special mention of our following key findings:

- Orders of Hon'ble Supreme Court dated 16th February 2018 (**Annexure 1.1**) were based on the proposals made in the Affidavit dated 13th December 2017 signed by PCCF (HOFF) for three selected Forest Ranges. Clearly these forests areas were never inspected by any Senior Officer of HPFD for ground verification before giving Affidavit in Hon'ble Supreme Court. Proposals in the Affidavit were drafted by taking data from Working Plans.
- The Committee has noticed during site inspections of Nurpur Forest Range, that in 12 Regeneration plots N/13 to N/24 (215.02 ha) listed before the Committee for fellings during 2018-19, there was such a heavy infestation of Lantana that entry into one forest of this category for inspection namely C 1 C Tattal N/14, was only possible after manual cutting of Lantana. We also inspected three other similar forests, namely N/13, N/22, and N/23 with an equally heavy infestation of Lantana and the state of these forests infested with Lantana is fully explained in video graphy. After inspecting four such forests with Lantana infestation, the Committee has given strict instructions to the field staff that total eradication of Lantana must be completed by October 2018 in all 12 such Regeneration plots categorised as **Red** in (**Annexure 2.2**). After inspections by us in October 2018, these forests will be approved for Experimental Silvicultural Fellings during the next year i.e. 2019-20.

**E: Status of Approvals:** The total forest area approved by Hon'ble Supreme Court in three Ranges during 2018-19 is 1128.20 hectares of 32 compartments, out of which 31 Regeneration plots comprising an area of 542.92 hectares **(48%)** have been approved by the Monitoring Committee.

**F: Maps of Three Selected Ranges:** As already mentioned under subparagraph D above, Digital maps of three selected Forest Ranges can be seen in DVD 2. However, for a quick look at the Regeneration plots, three maps are given in the Report as well with the following key features relating to forest canopy density classes:

**1. Bharari Forest Range:** (Page 63) 3 approved Regeneration Plots come under mixed different density classes:

- i. C-10 Nihari Plot- maximum area falls in the category of Very Dense (VDF) Forest and partially Moderately Dense Forest (MDF) and Open Forest (OF).
- ii. C-5(a) Tiamloo plot - maximum area falls in the category of Very Dense Forest and Open Forest
- iii. C-14(b) Kallar plot maximum area falls in the category of Open Forest and partially Very Dense Forest

**2. Paonta Forest Range:** (Page 64) 4 approved Regeneration plots come under mixed different classes

- i. C-6 Rajban plot- maximum area falls in the category of Open Forest and partially Moderately Dense Forest.
- ii. C-10 Rajban plot- maximum area falls in the categories of Very Dense Forest and partially Moderately Dense Forest
- iii. C-7 Gorakhpur plot- maximum area falls in the category of Very

Dense Forest and partially Moderately Dense Forest

- iv. C-14 Kukron plot maximum area falls in the category of Very Dense Forest and partially Moderately Dense Forest

**3. Nurpur Forest Range:** (Page 65) Based on interpretation of satellite data, Nurpur Forest Range 12 Approved Plots (2018-19) come under the category of Moderately Dense Forest

### **2.2.3 Status of Compliance of Orders of Hon'ble Supreme Court**

As elaborated earlier as well, issue wise findings of Monitoring Committee on TOR (**Annexure 1.1**) have been thematically tabulated in (**Annexure 1.3**). The latest status of compliance as on 15th August 2018, in respect of each stipulation is summarized under the following five broad groupings:

1. *Cited Orders of Hon'ble Supreme Court*
2. *Binding Regulatory Pre requisites for Experimental Silvicultural Felling*
3. *Species Specific Stipulations ; Khair, Chil, Sal and Eucalyptus*
4. *Adequate Budgetary Provision for Reafforestation*
5. *Ensuring Enabling Conditions for Regeneration*

## PART THREE - RECOMMENDATIONS AND NEXT STEPS

### CONTEXT

The Monitoring Committee has endeavoured to provide guidance and supervision by going through an elaborate process, robust enough to effectively facilitate monitoring and compliance of all safeguards and stipulations laid down by Hon'ble Supreme Court. Undoubtedly, it was a humongous task to conceptualize the practicalities of implementing the entire programme in a sequential time-frame. Clearly, from a professional context, it is a learning process for us as well. Based on our first hand feedback from our field inspections and suggestions of front line staff, it has become incumbent on us to **highlight** our following **three Recommendations** which merit consideration and further directions from Hon'ble Supreme Court in the overall context of putting in place a professionally sound forest management regime incorporating a package of best practices for sustainable management of valuable forests of Himachal Pradesh.

If deemed necessary, clarifications on these Recommendations can be sought from us in person or through email.

### 3.1 FIRST RECOMMENDATION: COMPARTMENT TO BE A UNIT OF MANAGEMENT-TREATMENT OF LEFT OVER AREAS OF 2018-19 IN 2019-20

#### 3.1.1 Implications of Splitting a Compartment for Silvicultural Treatment as Recommended by CEC

As already explained in Part two paragraph 2.1.2 that pursuant to our meeting in New Delhi on 8th March 2018 with CEC, it was reiterated

that the procedure to be followed for deciding the size of each regeneration plot will be as follows:

**Annexure 1.2 Para 1** *It is clarified that the unit size of area to be taken up for regeneration felling in a given compartment in a year shall not exceed 20 hectares. If the compartment is more than 20 hectares, it can be divided into two or more sub-units so as to avoid creation of large gaps in the forest canopy in a given location. During the discussion it has been clarified that the entire block of 903.4 hectares in Khair Working Circle cannot be taken up for silvicultural felling during 2018-19. The area has to be divided into regeneration blocks of not more than 20 hectares and silvicultural felling operations can be undertaken in one or more than one such block after leaving the adjoining block unfelled. Therefore while preparing the Management Plan the Forest Department of Himachal Pradesh shall keep in mind recommendation Nos (xi) and (xii) of CEC Report.*

*As regards left over area of a Compartment, CEC has stipulated as follows:*

**Annexure 1.1 Page 5-Recommendation no. xii)** *the felling operations in the adjoining forest area/ compartment of the already felled area/ compartment be taken up only after five years of regeneration felling in the given compartment and after ensuring that the regeneration is established in the already cleared forest area.*

The Monitoring Committee has accordingly followed the stipulation of restricting the size of each Regeneration plot to 20 hectares or less and because of this stipulation, the total area of a compartment prescribed for treatment in one year as per Working Plan could not be followed.

In the above context, it is considered necessary for us to point out the following implications of this stipulation:

**A: Details of Left Out Compartment Areas:** An abstract of all 31 approved Regeneration plots is given in **Annexure 2.2** and in Table 2.2 in Part 2, results of our inspections for 2018-19 and figures of **left out** areas have been worked out. The overall status of left over compartment areas is summarized in Table 3.1 as follows:

**Table 3.1 Left over areas (ha.) of 2018-19 and Approved Areas for 2019-20**

FOREST RANGE	NURPUR	PAONTA	BHARARI	TOTAL
SPECIES	KHAIR	SAL	CHIL	
LEFT OUT AREAS OF 2018-19 (Table 2.2)	472	107	3	<b>582</b>
AREAS APPROVED FOR WORKING IN 2019-20	706	120	24	<b>850</b>
TOTAL WORKLOAD FOR 2019-20	<b>1178</b>	<b>227</b>	<b>27</b>	<b>1432</b>

**B: Average Area of a Compartment:** It needs to be underlined that as analyzed in (**Annexure 2.2**), the overall average area of 32 compartments in three Ranges works out to 34.18 ha.(column 4),maximum area of a compartment being 80.32 ha.; minimum area being 9.50 ha. The overall average area of 31 approved Regeneration plots works out to 17.06 ha. (column 5).Out of 31 plots approved by the Monitoring Committee, there are only 5 Compartments of less than 20 ha. area and in remaining Compartments, left out areas are given in (**Annexure 2.2**) (column 6). In a hilly State like HP, the size of a Compartment is rather small unlike plains where the size of a



Compartment is too big, necessitating delineation of annual coupes within a Compartment.

**C: Approved Area only 48%:** It will be noticed from the above Table 3.1 that in Bharari Forest Range, the left out area is only **3** ha. and maximum left out area in Nurpur Forest Range is **472** ha. Overall, in three Forest Ranges, the area of approved Regeneration plots is 545.94 ha. i.e. **(48%)** of the total approved area of 1128.20 ha. as given in Table 2.2 in Part 2.

**D: Prescribed For Treatment in WP:** During our inspections, we noticed that areas now being taken up in 2018-19 were prescribed for fellings/treatment as per approved Working Plans as follows: Nurpur Forest Range-1990-91 and again in 2012-13; Paonta Forest Range-1998-99 and Bharari Forest Range-2012-13.

**E: Silvicultural System:** If only a part of the forest compartment (i.e. up to 20ha.), is chosen for working under silviculture fellings viz., Sal and Chil forests, which are normally managed under uniform shelter wood systems (where the age gradation of crop is nearly equal), the age gradation of the crop will get changed from uniform to irregular after silviculture fellings, and will not be eligible for management under uniform system in future. Thus one compartment which was used to be allotted to one working circle with one set of treatment may have to be allotted to two different working circles, with different kind of treatments, vitiating the established forest management principles.

**F: Abundant Safeguards in Place:** In Himachal Pradesh, it is not at all a case of clear felling in any of three types of forests. Furthermore, it is necessary to stress that Experimental Silviculture Fellings work is

being undertaken with abundant safeguards and being regulated in a way that number of mature trees to be retained (row 5) as seed bearers is more than prescribed in Working Plan in case of Khair and Chil forests (row 4) as will be seen from the table given below:

**Table 3.2 Working Plan Prescriptions and Hon'ble Supreme Court Orders:**

FOREST RANGE	NURPUR	PAONTA	BHARARI
SPECIES	KHAIR	SAL	CHIL
1. ROTATION AGE	30 YEARS	120 YEARS	120 YEARS
2.SILVICULTURE SYSTEM	<b>SELECTION FELLING</b>	<b>SHELTER WOOD SYSTEM</b>	<b>IRREGULAR SHELTER WOOD SYSTEM</b>
3.EXPLOITABLE DIAMETER	25 CM	40 CM	60 CM
4. MATURE MOTHER TREES PROPOSED FOR RETENTION IN AFFIDAVIT DATED 13.12.2017	20 %	60 TREES	20-25 TREES
5.MATURE MOTHER TREES APPROVED FOR RETENTION AS PER HON'BLE SUPREME COURT ORDERS DATED 16.2.2018	25% OR 50 TREES WHICHEVER IS LESS PAGE 10 PARA 9.3	40 TREES PAGE 10 PARA 9.4	40 TREES PAGE 10 PARA 9.4

**G: Safeguards for Ensuring Enabling Conditions for Regeneration:**

In addition, the Monitoring Committee has already made sure that the following Enabling Conditions for Regeneration as laid down by Hon'ble Supreme Court and given in **(Annexure 1.3)** Part 5 are complied with strictly under our Monitoring for two years (See Box 3.1)

**Box 3.1 Safeguards for Ensuring Enabling Conditions for Regeneration**

**CEC 4.vi)** *there will be total ban on burning of debris including after seeding or over wood felling in order to encourage natural regeneration of broad leaved species and reduce soil erosion*

**CEC 5.viii)** *planting component in Assisted Natural Regeneration shall include more than 50% seedlings of native broad leaved and multipurpose use species other than that of the principal species;*

**CEC 5.ix)** *the removal of Lantana weed to be an integral component of regeneration felling and the removal of Lantana has to be completed before the felling operations commence, so that the regeneration of the felled area is taken up forthwith*

**CEC 5.xiii)** *adequate soil and moisture conservation measures are to be undertaken in regeneration area*

**SC 9.6.** *It should also be ensured that these forest areas are kept free from grazing and are protected*

**SC 9.7** *The State should ensure that sufficient numbers of healthy saplings are planted so that there is proper regeneration of the forest.*

**3.1.2 Maintaining Sanctity of a Compartment Advisable**

It needs to be pointed out that since inception of scientific forest management; a forest compartment is constituted after on ground

identification of a particular forest on the basis of homogeneous crop and its boundaries are well delineated. (See Box 3.2)

**Box 3.2 Sanctity of a Compartment as a Unit of Management**

*A compartment is a permanently defined, geographically recognizable unit of forest land forming the basis for planning, prescription, implementation, monitoring and recording of forest operations. A compartment is kept, as far as possible, homogeneous throughout its extent with regards to the composition of growing stock, soil and aspect. The average area of a compartment in Indian forests usually ranges between 50-100 hectares. During the preparation of a working plan a compartment is inspected and if necessary it is further sub-divided into sub-compartments to meet with specific management objectives.*

For carrying out the prescriptions of an approved Working Plan, the smallest unit of management at the implementation level is a Forest Compartment, which is allotted to a specific Working Circle and necessarily it should be worked at one time for silviculture felling. A Compartment History File is a basic repository of all data pertaining to each Compartment as follows: (See Box 3.3)

### **Box 3.3 Technical Data Maintained Compartment Wise**

- 1. Basic Information:** (i) Situation, (ii) Boundary, (iii) Area, (iv) Elevation, (v) Aspect, (vi) Slope, (vii) Rock, (viii) Soil type.
- 2. Description of Growing stock :** (i) Over wood, (ii) Density, (iii) Regeneration status, (iv) Underwood, (v) Periodic Block allotment, (vi) Treatment prescribed, (vii) Enumeration results.
- 3. Forms Maintained:** (i) Form A- Trees marked for silvicultural felling by Departmental agency, (ii) Form B- Trees marked for right holders or free grants, (iii) Form C- Regeneration control with progress of regeneration and silvicultural operations.
- 4. Compartment outturn statement:** It gives the year and species wise round timber and sawn timber outturn in cubic meters.
- 5. Miscellaneous regulations:** (i) Resin tapping, (ii) Construction/repair of Road & Paths, (iii) Construction/repair of Buildings, (iv) Construction/repair of Boundaru Pillars.

### **CONCLUSIONS:**

1. Clearly, all these forests now being taken up in selected three Forest Ranges have already remained untreated for a long time and to further defer treatment of left over areas would be totally

a retrograde step.

2. Each forest compartment approved for treatment must be gone over in the year as prescribed in the WP, taking it as a unit of working and treatment should not be limited to 20 ha.
3. It may be advisable to treat few Compartments in a year, but total treatment of a Compartment must be done as a unit of management and treatment in a staggered manner is technically incorrect.
4. In view of the aforementioned safeguards and in order to maintain the technical requirement of ensuring uniform treatment of a Compartment in the year of working, it is considered advisable not to stagger silvicultural fellings by partial treatment of a compartment.

**In conclusion, it is recommended that in order to ensure that Experimental Silvicultural Fellings and thinning for these two years are carried out holistically as warranted professionally and technically, the left out areas of 2018-19 i.e. 582 ha. be taken up in 2019-20 along with approved areas of 850 ha. for next year i.e. 2019-20. The total area of each compartment approved for treatment should be gone over in a single year, taking it as a unit of working and treatment should not be limited to 20 ha, which is not based on sound principles of forestry.**

### **3.2 SECOND RECOMMENDATION: APPROVAL OF FELLING IN EUCALYPTUS FORESTS.**

The Monitoring Committee has noticed while developing a thematically tabulated summary of Terms of Reference (**Annexure 1.3**), especially

part 3 Species Specific Stipulations that recommendation number (iii) of CEC on page 4 of orders by Hon'ble Supreme Court reads as follows:

**4. iii) 764** *ha. of Eucalyptus trees proposed for felling as per Working Plan prescriptions be permitted to be felled and the same area regenerated with native broad leaved species;*

HPFD was requested to make available to us relevant back ground information on this issue. The information so supplied is summed up as follows:

- The Hon'ble Supreme Court vide order dated 10th February 2017 directed the CEC to file its report in the matter. In response to this order of Hon'ble Supreme Court, the CEC examined the matter and sought information from the State on twelve issues vide its letter dated 21st March 2017, and one of the twelve issues, was the division wise extent of each type of forest proposed to be subjected to felling and thinning.
- The State compiled this information division, working circle and area-wise up to the elevation of 1500 m above MSL, proposed for felling and thinning and supplied to the CEC. While supplying this information, an area of **764** ha. under Eucalyptus (Overlapping) Working Circle pertaining to Nahan and Paonta Forest Divisions was also proposed for felling to CEC.
- Based on this information supplied by HPFD, the CEC made recommendation in its report for permission to fell of **764** ha of



Eucalyptus trees as per Working Plans and for the same area to be regenerated with native broad-leaved species. (See Table 3.3)

**Table 3.3 Proposed Eucalyptus Forests for Felling in 2018-19 by CEC**

Name of Division	Forest Range	Area (ha.)
Paonta	Bhagani	114.47
	Paonta	31.96
	Majra	171.57
	Giri Nagar	22.10
<b>Total</b>		<b>340.10</b>
Nahan	Kolar	88.21
	Nahan	254.94
	Trilokpur	14.46
	Jamta	66.20
<b>Total</b>		<b>423.81</b>
<b>Grand Total</b>		<b>763.91</b>

The felling of Eucalyptus is prescribed in Vineet Kumar Working Plan (1998-99 to 2012-13) for next fifteen years. Although some areas have been felled in the early eighties and they again become due for felling in Vineet Kumar Working Plan (1998-99 to 2012-13) period. No felling was carried out in above areas during the period (1998-99 to 2012-13) which need to be felled now.

The proposed sequence of felling is as under (Table 3.4):

**Table 3.4 Proposed Eucalyptus Forests for Felling in 2018-19**

Year of felling as per WP	Name of Forest Division/ Forest Range	Name of Forest	Compartment No.	Total Area (ha.)	Area (ha) under Eucalyptus. (Overlapping.) Working Circle. prescribed for felling
1998-99	Paonta/Bhagani	R-10 Giri	2	25.15	10.00
	Nahan/Jamta	R-135 Tallon	4	62.40	40.00
<b>Total</b>					<b>50.00</b>

**Working Plan Prescriptions:**

- As the growth of Eucalyptus is generally poor, no exploitable diameter is prescribed. However, a dia of 20 cm dbh will be suitable for use as pulpwood/fuel wood.
- Rotation of 15 years is prescribed for coppice and 30 years for standard.
- Method of executing felling for Eucalyptus is governed by following rules:
  - i. All Eucalyptus trees are to be marked. No other native broad-leaved species are to be marked.
  - ii. Unmarked and damaged poles below 10 cms dia. will be cut back at the time of felling.
  - iii. Standard at rate of 15-18 trees per hectare preferably of young trees giving a spacing of about 23-25 meters shall be retained.
  - iv. In case where Eucalyptus is growing with other species the standards of other species will be kept.
  - v. Felling shall be completed by 15th January.
  - vi. The Stump will be about 15 cm high and will be given a sharp slanting cut facing the direction opposite to sun ray.

**Conclusion: The Monitoring Committee recommends that on an experimental basis, 50 ha. of Eucalyptus forests (10 ha. in Paonta Forest Division and 40 ha. in Nahan Forest Division) may be approved for felling during 2018-19.**

**Felling of the Eucalyptus is to be completed before 15th January 2019.**

### **3.3. THIRD RECOMMENDATION: APPROVAL FOR REVIVAL OF SOUND FOREST MANAGEMENT PRACTICES IN HIMACHAL FORESTS**

**3.3.1. Implications of Ban on Green Fellings:** In response to a notice of 14th February 2000 issued by Hon'ble Supreme Court as cited on page 3, paragraph 3 (**Annexure 1.1**), it has been submitted in an Affidavit dated 1st March 2000, filed on behalf of Himachal Pradesh Government in its paragraph 4 as follows:

*“That as far as the decision to lift ban on felling of trees is concerned, it is humbly submitted that following considerable removal of trees for packing cases, the Government at that time had decided to discontinue all green fellings for such purposes till the forests were restored to the optimum density and composition. A **moratorium** on felling of green trees was imposed with effect from 23rd March 1994 which is still in operation and has not been lifted.”*

Thereafter a ban was imposed on green fellings in a large number of States in India including Himachal Pradesh from 12th December 1996 onwards as per Orders of Hon'ble Supreme Court in Writ Petition (Civil) No. 202 of 1995. Consequently HPFD has passed through a phase of **dormancy** for last 24 years and the recent order of Hon'ble Supreme Court dated 16th February 2018, allowing Experimental Silvicultural Fellings has really come as a wake-up call for HPFD.

Under these circumstances, the Monitoring Committee had a challenging task more like cleaning the locked stables after 24 years and reinitiating professional forestry *practices both at macro and micro*

*levels* in order to activate and revamp a regime of scientific forest management by putting in place a system of field inspections by hierarchy of forest service.

Unfortunately, ban on green fellings has been misconstrued at many levels of HPFD as a ban on regular inspections of forests and consequently an age old tested tradition in forestry had vanished and more reliance on desk duties particularly at senior levels of hierarchy had effectively become a way of managing forests in this dormancy phase.

Though, the forests were being inspected by forest officers to monitor plantations, fire protection and for checking illegal activities such as unauthorized mining, illicit cutting, encroachment, poaching etc., the silvicultural aspect, so vital for scientific forestry, was a casualty due to moratorium on green fellings.

#### **A. URGENCY TO REVIVE SCIENTIFIC FOREST MANAGEMENT PRACTICES**

The Monitoring Committee has noticed during site inspections and ground verification, including observations of V.P.Mohan, during a field excursion trip to Rajgarh Forest Division in June 2018 that basic conservancy routine prescribed forestry activities have not been carried out and this inaction has resulted in congestions and accumulation of debris in forests. These forests are turning into jungles. For maintaining the health and fast growth, all tending operations are required to be carried out annually as prescribed in Working Plans. Following are the important operations to be carried out on priority even in all other forests in HP apart from three selected Forest Ranges:

- **Cleaning:** The cleaning operations used to be carried out in the early stages of both in congested natural regeneration areas and plantations on regular basis till the area is suitable for early thinning. All forked, crooked, sickly and damaged plants are cut to provide growing space to better plants. This operation keeps the regeneration areas clean to safeguard against fire hazard.
- **Thinning:** Ban on green felling also means stoppage of important operations like thinning to decongest forests and removal of green wood could not be attempted for fear of violating the ban. This adversely impacts the regeneration and the growth of the young crop which due to competition for space, light and nutrients remain weak, unhealthy and makes the forest prone to fires more adversely.
- **Subsidiary Silvicultural Operations:** Due to ban on green felling of trees, the necessary subsidiary operations like collection and disposal of slash, control burning, weeding and cleanings are also neglected or totally suspended as a result, incidences of forest fires increase due to accumulation of inflammable material in the form of needles and leaves.
- **Creation and Maintenance of Fire lines:** The fire lines used to break the wildfires. But presently these fire lines are not being maintained properly as maintenance of fire lines would involve clearing of growth. Further creation of new fire lines involve felling of green trees which is banned by Hon'ble Supreme Court.

- **Control Burning:** The control burning reduces the accumulation of inflammable material in the forest. Further in the first year this operation would clear the forest floor and will facilitate the natural regeneration process. At present control burning to a very minimal extent is being carried out in the forest areas.
- **Climber Cutting:** The parasite climber takes away the nutrients from the host tree and affects its growth. The climbers also affect the growth of bole of tree and reduce the timber qualities.
- **Removals of Invasive Species and Weeds:** Obnoxious invasive species like Lantana, Ageratum and weeds like **Ardisia** in Sal forests are also required to be removed as their growth suppresses the growth of seedlings and saplings of young crop.
- **Construction and Maintenance of Boundary Pillars:** The Boundary Pillar programme given in the respective Working Plans should be followed strictly and sufficient funds should be provided for the same

## **B. FINDINGS OF A STUDY BY FRI IN 2018**

Recently Uttarakhand Forest Development Corporation had assigned a project on "**Study on Impact of Ban on Green Felling on Biophysical Status of Forest in Context to Production Prescribed in Working plans Vis-a-Vis Actual Production from Chir Forest of Uttarakhand**" to Forest Research Institute, Dehradun (FRI) primarily to assess the impact of ban on green felling on forest yield, phyto-diversity, growing stock, volume, and regeneration of Chirpine forest in the State of Uttarakhand.

It will be useful to reproduce a gist of key findings from this Study as follows: (See Box 3.4):

**Box 3.4 Gist of Key Findings of Study by FRI**

- *All Chirpine forests are managed under the Conversion to Uniform system, a kind of shelter wood silvicultural system in the State of Uttarakhand.*
- *The study revealed that due to ban on felling of trees above 1000m the uniform system of management has been halted. Ultimately it has resulted in the shading of young seedlings which remain weak and die as no openings of canopy was carried out.*
- *In treated areas 34 tree species and 66 shrub species were recorded, whereas in control areas it was only 21 and 56 for tree and shrub, respectively. It shows that in treated area the tree and shrub species are more in comparison to control area.*
- *The per hectare storage of carbon in treated Chir forests was 31.80 tons/ha, but the control areas had a far less amount of carbon storage of 14.12 tons/ha.*
- *It is, therefore, recommended that the Uttarakhand Forest Department may take an appropriate policy decision to maintain the scientifically prescribed silvicultural technique for adoption of Uniform Shelter wood system for sustainable management of Chirpine forest.*

### **C. Economic Valuation of Forests of Himachal Pradesh:**

Himachal Pradesh having the locational advantage (being a hill state which serves as a major watershed to numerous river & rural and urban areas) and its 66% geographical area is under forests, plays a pivotal role in the regional and National economy. Undoubtedly, there is an urgent need for scientific and sustainable management of forests which is possible only when the policy makers and planners understand the real worth of the forests in terms of tangible and intangible benefits from our forest ecosystems. Recognizing contribution of forests in the economic development of the State, HPFD commissioned a study titled “**Economic Valuation of Forests of Himachal Pradesh**”, as a part of a Forest Sector Review in 2000, by the Indian Institute of Forest Management (IIFM), Bhopal to provide a first estimate of economic value of various goods and services provided by the Himachal Forests. More recently in September 2016, another study titled “**Ecosystem Services Valuation and Accounting of Himachal Forests**” has been published by IIFM in collaboration with HPFD. It will be useful to look at a summary of key statistics from these two studies as follows:

**Table 3.5 Economic Valuation of Forests of Himachal Pradesh**

<b>FOREST SECTOR REVIEW IN 2000-IIFM STUDY</b>	
<b>VALUE OF GROWING STOCK OF FORESTS IN 2000</b>	<b>40,860 CRORES</b>
<b>TOTAL VALUE OF ECO SYSTEM SERVICES</b>	<b>1,06,000 CRORES</b>



<b>ECOSYSTEM SERVICES VALUATION AND ACCOUNTING OF HIMACHAL FORESTS IIFM SEPTEMBER 2016</b>	
<b>TOTAL GROWING STOCK OF FORESTS</b>	<b>342 MILLION CUM</b>
<b>TOTAL ECONOMIC VALUATION OF TIMBER STOCK</b>	<b>8,55,000 CRORES</b>
<b>RECORDED FOREST AREA OF THE STATE</b>	<b>37,033 SQ KM</b>
<b>TOTAL FLOW BENEFITS(,FUEL WOOD, TIMBER,BAMBOO, FODDER BIO PROSPECTING, POLLINATION AND SEED DISPERSAL, CARBON STORAGE, CARBON SEQUESTRATION, WATER RECHARGE AND WATER PURIFICATION</b>	<b>53,434 CRORES</b>
<b>ECONOMIC VALUE OF FLOW BENEFITS PER UNIT AREA</b>	<b>1 CRORE 44 LAKHS PER YEAR PER SQ KM</b>

These two studies clearly bring out huge values of our forests for a range of flow benefits like watershed functions, carbon storage, biodiversity and eco-tourism services apart from the current real value (Rs.8, 55,000 crores) of the growing stock of forests. The key issue is how to realise these high values in actual practice by ensuring that our precious natural resources are managed scientifically by application of prescribed silvicultural practices on a continuing basis.

**Conclusion: In view of the aforementioned facts, the Monitoring Committee recommends that to maintain healthy, young and biodiversity rich forests, it is necessary to allow revival of prescribed silvicultural operations like cleaning, thinning and**

salvage of dead, dry trees as well as subsidiary silvicultural operations, like control burning for disposal of slash following other scientific prescriptions given in the approved Working Plans. Certainly, these operations will need adequate budgetary provision under a definite budget head titled “Subsidiary Silvicultural Operations”. These operations will also improve rural livelihoods for the Village Forest Development Societies and participation of local people should be sought while implementing these field activities.

Considering that the proposed silvicultural operations will get revived after a long gap, the implementation of these operations will certainly need a revamped system of Mandatory Monitoring through field verifications by hierarchy at senior level to ensure strict compliance of the intended interventions.

#### **NEXT STEPS**

A. In order to ensure that the implementation of strict regulatory stipulations as laid down by Hon’ble Supreme Court for this entire programme of Experimental Silvicultural Fellings are first correctly understood and efficiently implemented at the cutting edge level with the required professional knowledge and training, the Monitoring Committee had requested the State Government for two interventions as follows:

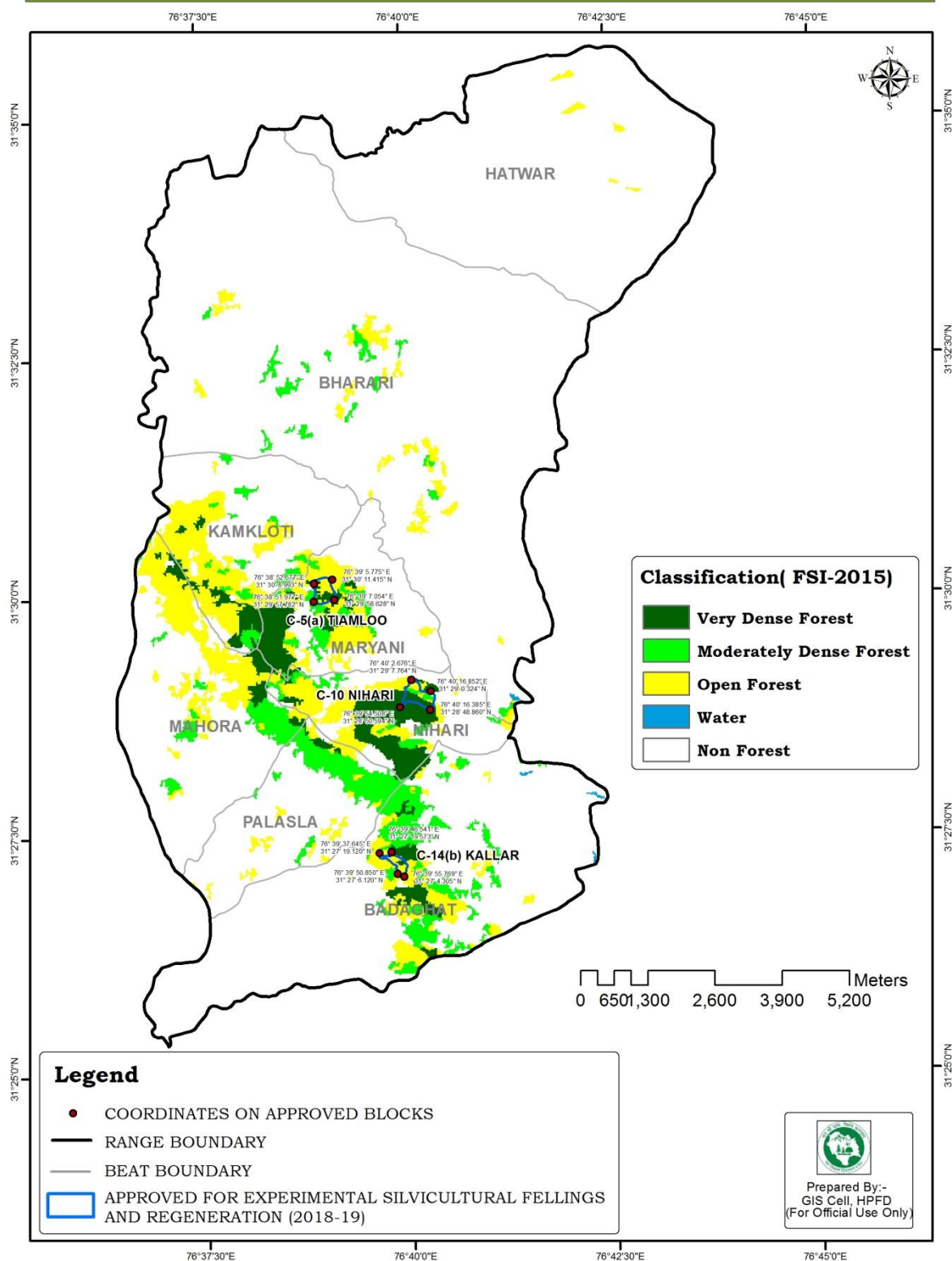
1. Posting of IFS officers in Cadre Forest Divisions of Nurgur and Paonta, there being already an IFS officer in Bilaspur Forest Division. Finally posting orders have been issued and we have

in position three IFS officers manning these Forest Divisions where work is to be monitored by us for two years.

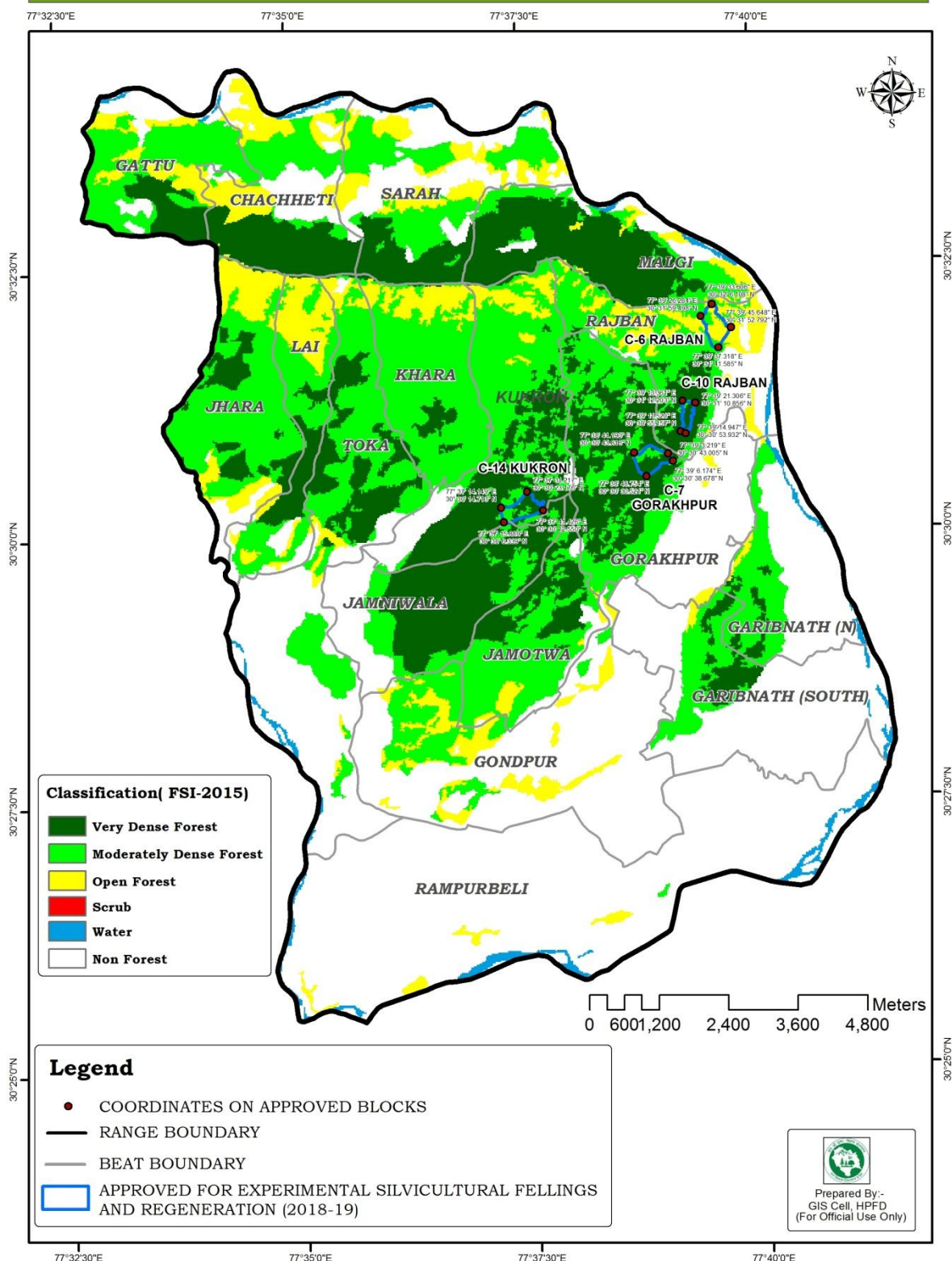
2. Likewise in three selected Forest Ranges of Nurpur, Bharari and Paonta, Range officers should be directly recruited Rangers and not promoted incumbents, so that professional aspects of the work are not compromised.

**B.** A short duration training of field staff like Forest Guards and Deputy Rangers from three Forest Ranges selected for Experimental Silvicultural Fellings is being organized in Jan 2019 at Forest Training Institute at Sundernagar.

# EXPERIMENTAL SILVICULTURE FELLINGS IN 2018-19 (BHARARI RANGE IN BILASPUR DIVISION)



# EXPERIMENTAL SILVICULTURE FELLINGS IN 2018-19 (PAONTA RANGE IN PAONTA DIVISION)





75°47'30"E      75°50'0"E      75°52'30"E      75°55'0"E      75°57'30"E      76°0'0"E

