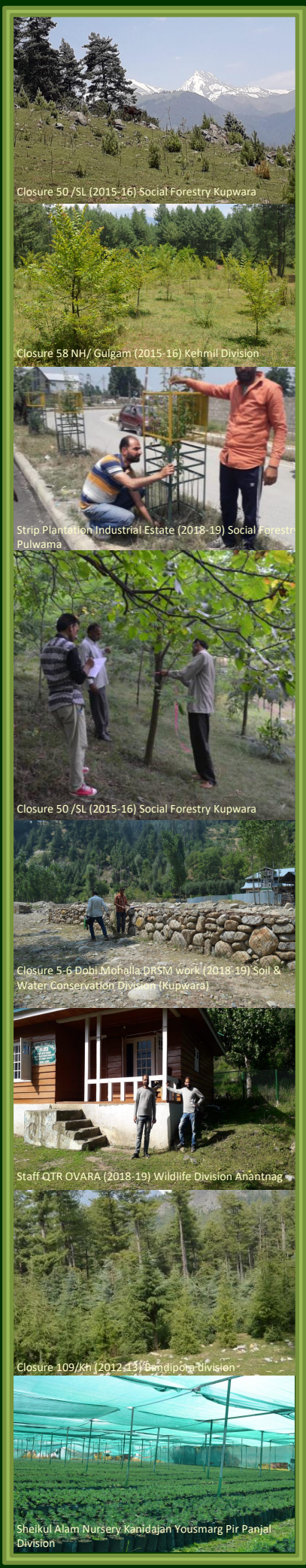
Report
on
Evaluation of Works done under Compensatory Afforestation Fund Management and Planning Authority(CAMPA) in Kashmir Region



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Abbreviations

APO	Annual Plan of Operation
BP	Biological Park
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CEC	Central Empowered Committee
DRSM	Dry Rubble Soil Moisture
EPA	Entry Point Activity
FGD	Focused Group Discussion
GIS	Geographic Information System
Ha	Hectare
IGA	Income Generation Activities
JFM	Joint Forest Management
J & K	Jammu and Kashmir
MDF	Moderately Dense Forest
M&E	Monitoring and Evaluation
NGO	Non- Government Organization
NPV	Net Present Value
NR	Natural Regeneration
OF	Open Forest
LULC	Land Use Land Cover
PA	Pretected Area
PAN	Protection Area Network
PRA	Participatory Rural Appraisal
RFA	Recorded Forest Area
RFT	Running Feet
RMT	Running Meter
Sq km	Square Kilometer
SHG	Self Help Group
SLMC	State Level Management Committee
SLSC	State Level Steering Committee
SMC	Soil Moisture Conservation
UT	Union Territory
VDF	Very Dense Forest
VFMC	Village Forest Management Committee
VFPMC	Village Forest Protection Management Committee
VMC	Vigilance and Monitoring Committee
WL	Wildlife
WLS	Wildlife Sanctuary

Executive Summary

I. Background

The Government of India vide notification dated 31.10.2019 has carved out two union territories of Jammu & Kashmir and Ladakh from the erstwhile State of Jammu & Kashmir. Situated in the northern- most part of the country, Jammu & Kashmir (UT) and Ladakh (UT), cover an area of 2,22,236 sq km, which is 6.76% of the geographical area of the country. The UT of Jammu & Kashmir is bordered by Pakistan in the west; UT of Ladakh is situated on the northern and eastern side and the States of Himachal Pradesh and Punjab lie South to the UT of Jammu & Kashmir. The UT of Ladakh has international border with Pakistan, Afghanistan and China. It shares borders with the UT of Jammu & Kashmir in the West and Himachal Pradesh in the South. The average annual rainfall varies from about 600 mm to about 800 mm and the average annual temperature from sub-zero to 40°C. The two UT's are drained by a number of rivers viz Jhelum, Chenab, Indus, Ravi, Tawi etc. All the 22 districts of UT of Jammu & Kashmir and two districts of UT of Ladakh are hill districts and both UT's do not have any tribal district. As per census 2011, the combined population of two UT's is 12.54 million accounting to 1.04% of India's population. The rural and urban population constitute 72.62% and 27.38% respectively. Tribal population is 11.91% of the UT's population. The average population density of the two UTs is 125 persons per sq km, which is lower than the national average. The 19th livestock census 2012 has reported a total livestock population of 9.2 million.

II. Forests in Jammu and Kashmir

Forests of the Union Territory are spread over two broad geo-climatic zones: Jammu and Kashmir. Vegetation and climate are broadly being categorized into sub-tropical, temperate and alpine zones with wide diversity of fauna and flora. More than 50% of the plant species used in British pharmacopoeia are reported to grow in Jammu and Kashmir. Literature

review indicates that 572 plant species belonging to 109 different families have medicinal value.

As per State of Forest Report 2019 issued by Forest Survey of India, the forest cover in Recorded Forest Area (RFA) in the two UTs is 20,230 sq km of which 17,643 sq km is Reserved Forests, 2,551 sq km is Protected Forest, and 36 sq km is Unclassed Forests.

III. Current Study

The current study aims to physically monitor and evaluate work done under CAMPA during the years 2012-13 to 2018-19 in the three circles namely South, North and Srinagar circle of Kashmir region. The objective of the intended third-party Monitoring and Evaluation study is to conduct process monitoring, ascertain the execution and efficacy of the works including ancillary activities. The scope of the work of the study is delineated in the proceeding texts

Physical monitoring through enumeration method especially with respect to

i. Survival percentage of planted samplings, enclosure wise, along with number and species planted.
ii. Growth Parameters like Height and Girth and Crown status of Planted Plantation.
iii. Observation regarding the type and effectiveness of fencing and soil conservation works etc
iv. General public opinion based on FGD with the inhabitants residing in the nearby closure areas.
v. In case of failure of plantation or low survival percentage of the enclosure, the probable reasons thereof.

IV. Study Team and Manpower Deployment

The study team consisted of field teams under able guidance and direction of a multidisciplinary team of experts. The expert team was responsible for conceptualisation, planning, direction, expert observation and overall coordination. The expert's responsibilities also included the tasks of designing of methodology, designing of formats for collection of data from field, pilot field study, planning and execution of field data collection

from plantation sites, analysis of data collected from field for interpretation of results and compilation of the evaluation report. The field teams consisted of field enumerators who were responsible for collection of data (physical measurements and ocular observations), FGD with local community, checking of documents at Division and Range level from sample sites being evaluated. In the South Circle, a team of 5 field enumerators (team 1) were deputed for data collection work whereas, 5 field enumerators (team 2) were deputed in the North and Srinagar circle. The field enumerators were accompanied by skilled assistants for assisting in enumeration of all trees planted in a closure/site. After selecting the closure, the whole area was to be divided into sections, one allotted to each enumerator. Local staffs (mostly Block Officers) were always with the evaluation team so that they could verify the authenticity and correctness of the data collected. Each team of field enumerators was supervised by a circle coordinator.

V. Methodology

Sampling: About 10 % of the sites of CAMPA were covered for the current evaluation study. Before visiting the closure for monitoring, all the records pertaining to the plantation were obtained from the Range Headquarter and Closure Journal from the Block In-charge or from the Forest Guard. Apart from actual counting of the planted seedlings and recording height and girth of various species, observation regarding soil conservation measures and fencing were also made. A complete enumeration of all seedlings planted during the years 2012-13 to 2018-19 in each of the sampled sites was conducted. Inside each sampled site, five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site were laid for detailed monitoring and evaluation, i.e., measurement of growth, height, girth, crown conditions and for capturing the status of rejuvenation and regeneration of the plantation area.

Data Collection: The evaluation survey included both primary and secondary data collection.

Secondary Data Collection: Secondary data, i.e., official documents and records were collected from Division Headquarter/Range offices. An exhaustive checklist developed for this study was referred by the field enumerators and the coordinators to ensure collection

of all relevant secondary data uniformly across all sites. The major documents collected *inter alia* included:

- Working plans;
- Site specific planning documents (micro plans if any);
- Plantation journals;
- Measurement books;
- Bill of materials;
- Proceeding of the meetings – at committee, tertiary level;
- Progress Reports if any;
- Catchment area treatment plan if any;
- CAMPA annual reports;
- Inspection and follow up notes;
- District statistical handbooks; etc.

Primary Data Collection: Primary data collection was done by physical measurements and observations in sample sites. Data pertaining to area, location, species planted, their numbers and survival, height and girth of plants, vigour of the plants, fencing and other maintenance activities, biotic pressure, site suitability and overall performance etc. was collected by the field enumerators and recorded. Besides, FGDs were conducted amongst the nearby inhabitants of the CAMPA closure sites for primary data collection with respect to the participation of community of the area in planning and execution of activities, demographic details, dependence on nearby plantation closure, issues and suggestions from the villagers, usufruct rights and benefit sharing mechanism.

VI. Major observations from the field

A total of 133 sites in 23 divisions of 3 circles, namely, South Circle (64 sites), North Circle (34 sites) and Srinagar Circle (35 sites) for the work done under CAMPA during the year 2012-13 to 2018-19 were evaluated. As per records, a total of 32,68,821 plants were planted in three circles of Kashmir region. In terms of survival, in the 133 sites of 3 circles, a total of 16,05,281 plants were recorded on the ground belonging to 36 species including

fruit trees, medicinal and ornamental plants, which gave an overall average of 49.11% in all the three circles. The Circle-wise observations are summarised below:

Kashmir South Circle

In South Circle, 11 divisions namely, Anantnag (7 sites), Anantnag Social forestry (7 Sites), Annatnag Soil & Water conservation (4 sites), Anantnag Wildlife (5 sites), Awantipora (5 sites), Kulgam (7 sites), Lidder (7 sites), Pulwama Social Forestry (7 sites), Shopian (7 sites), Shopian Soil & Water Conservation (4 sites) and Shopian Wildlife (4 sites) were evaluated. Among the 11 divisions with respect to survival percentage, the maximum survival percentage was recorded in Lidder division with an overall average of 66.75% followed by Shopian Soil & Water Conservation 60.33%, Anantnag Social Forestry 59.15%, Anantnag Soil & Water Conservation 54.37%, Pulwama Social Forestry 50.78%, Awantipora 44.17%, Kulgam 39.07%, Shopian Wildlife 37.94%, Anantnag 30.49% and Shopian 22.55%. The minimum survival percentage was recorded in Anantnag Wildlife division with 12.29%. In respect of growth parameter, the Anantnag Social Forestry division has showed best performance in height and Lidder division has showed the best performance in girth. The least performance in terms of height was recored in Awantipora and least girth was recorded in Shopian Soil & Water Conservation. In the 64 sites of 11 units as per record, 13,62,614 plants were planted of which 5,81,113 plants were recorded surviving on ground belonging to 25 tree species including fruit trees, medicinal and ornamental plants estimating to, an overall average survival of 42.65%. The maximum numbers of plants recorded on ground were *Robinia pseudoacacia* (1,32,083) followed by *Cedrus deodara* (1,17,825), *Pinus wallichiana* (1,02,474), *Ulmus wallichiana* (59,179), *Malus domestica* (49,266) & etc. No variation recorded in fencing in 63 sites. However, the variation was recorded only at 1 plantation site of Social Forestry Pulwama (strip plantation at Industrial Estate Nowpora 2018-19) where 70 tree guards are missing out of 600 tree guard laid. The water harvesting works was carried in 6 sites out of surveyed 64 sites, was serving the intended purpose and no variation was recorded in water harvesting works. The regeneration survey was conducted inside five sample plots of 0.1 ha in the east, west, north, south and centre direction of the closure site taken up for detailed survey. Natural

regeneration has been observed in all 64 sample sites for the naturally occurring species like *Pinus wallichiana, Cedrus deodara, Robinia pseudoacacia, Ulmus wallichiana, Prunus armeniaca, Juglans regia & etc.* The level of participants in the FGD was satisfactory in all the sites evaluated.

Kashmir North Circle

In North Circle, 6 divisions namely JV (5 sites), Kamraj (6 sites), Kehmil (7 sites), Kupwara Social Forestry (6 sites), Kupwara Soil & Water Conservation (3 sites) and Langate (7 sites) were evaluated. Among the 6 divisions the maximum survival percentage was recorded in Kupwara Social Forestry division with an overall average of 80.92% followed by Langate 71.01%, JV 70.05%, Kehmil 50.67 and Kupwara Soil & Water Conservation 37.27%. The minimum survival percentage was recorded in Kamraj division at 25.70%.

In respect of growth parameters, Kupwara Soil & Water Conservation division has showed best performance for height and girth. The least performance in height and girth was recorded in JV division. In the 34 sites of 6 divisions as per record, 853698 plants were planted of which 488507 plants of 13 species including fruit trees, medicinal and ornamental plants have been found surviving with an average survival of 57.22%. The maximum numbers of plants recorded on ground were *Cedrus deodara (1,80,046), Robinia pseudoacacia (1,76,624), Ulmus wallichiana (40,204), Aesculus indica (34,070), Pinus wallichiana (29,385) & etc*. In the 34 sites of North Circle, the variation in fencing was recorded at Kamraj divisions 2 sites (closure Gundimsncher 25/SL 2013-14 & closure Khudi 91a/NL 2014-15) and in JV division 2 sites (closure 68 Kaitawal of 2013-14 & closure 68 Kaitawal of 2014-115. The overall variation in fencing in North Circle was recorded 2.01%. The water harvesting structures variation (325 cum) was recorded in 2 sites of Kamraj division (250 cum) and 1 site of Kupwara Social Forestry division (75 cum).

The regeneration survey was conducted inside five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site taken up for detailed survey. Natural regeneration has been observed in the sample sites for the naturally occurring species like

Cedrus deodara, Pinus wallichiana, Robinia pseudoacacia, Ulmus wallichiana, Abies Pindrow, Taxus baccata, Juglans regia etc. The level of community participation has been found to be satisfactory in all the sites evaluated.

Srinagar Circle

In Srinagar Circle, 6 divisions namely Bandipora (6 sites), PirPanjal (7 sites), Sindh (7 sites), Srinagar Social Forestry (6 sites), Srinagar Urban (2 sites) and Tangmarg (7 sites) were evaluated. Among the 6 divisions with respect to survival percentage, the maximum survival percentage was recorded in Pir Panjal division (70.33%) followed by Srinagar Urban (69.75%), Bandipora (58.40%), Tangmarg (54.57%) and Srinagar social Forestry (38.37%). The minimum survival percentage was recorded in Sindh division (32.24%).

In respect of growth parameters, Bandipora division showed the best performance in height, PirPanjal division showed the best performance in girth. The least performance in height and girth was recorded in Tangmarg and Srinagar Urban division, respectively. In the 35 sites of 06 divisions as per record 10,52,509 plants were planted of which 5,35,661 plants were recorded on ground belonging to 20 tree species including fruit trees, medicinal plants and ornamental plants, with an overall survival of 50.89%. The maximum numbers of plants recorded on ground were *Cedrus deodara* (2,34,349), *Robinia pseudoacacia* (1,45,230), *Pinus wallichiana* (97,471), *Ulmus wallichiana* (37,205), *Aesculus indica* (10,691) *& etc.* No variation in fencing recorded from the 35 evaluated sampled sites of Srinagar Circle. The water harvesting works like DRSM, Crate wire (710 cum) was carried in 5 sites out of surveyed 35 sites. The variation in water harvesting work was recorded in 3 sites in Sindh division (320 cum) and in Social Forestry Srinagar division in 1 site (100 cum). The regeneration survey was conducted inside five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site taken up for detailed survey. Natural regeneration has been observed in the sample sites for the naturally occurring species like *Cedrus deodara, Pinus wallichiana, Robinia pseudoacacia, Abies Pindrow, Picea smithiana, Taxus baccata, Ulmus wallichiana, Aesculus indica etc.* The level of participants in the FGD was satisfactory in all the sites evaluated.

Community Perception (through FGD)

Views of the local community were collected, through Focused Group Discussion from the inhabitants of the closure sites and their views were solicited on various aspects like CAMPA project, rapport with forest department, incidence of forest fire in the area, public demands, usufruct right and benefit sharing mechanism etc. During FGD in the evaluation area it was observed that around 78% inhabitants of the CAMPA closure sites are aware of CAMPA project. However, the community was not involved in planning and implementation of the project barring a few persons who were involved at the time of fencing and plantation of closures. It was found that the contractors used their own labors for fencing of closures. The inhabitants of the closure sites are mostly dependent on livestock so on usufruct right and benefit sharing the response of the community was found satisfactory. They are getting fodder for livestock from the closure sites. During FGD it was recorded that, in case of fire incident in the forest area, people are helping forest officials for dousing the fire, which is a good sign. People are demanding that they should be engaged by the department for any work that is to be done in the forest area. They are also demanding that watch and ward should be provided to the closure sites.

Year-wise Circle-wise survival & natural regeneration in Kashmir Region

The overall picture of the survival and natural regeneration, Year-wise and Circle-wise based on the sample sites is presented as under:

Year	Circle	No. of Closures	Area (ha)	No. of plants planted	No. of surviving plants	Survival %	No. of plants survived per ha	NR (per ha)	Total No. of Plants (Survived + NR) per ha	Result* (Very Good/ Good/Satisfactory / Deficient)
2012-13	South Circle	7	150	193900	76770	39.59	512	411	923	Good
	North Circle	5	125	175990	96970	55.10	776	456	1232	Very Good
	Srinagar Circle	5	90	155175	87075	56.11	968	488	1456	Very Good
	Kashmir Region	17	365	525065	260815	49.67	715	451	1166	Very Good
2013-14	South Circle	7	132.6	129692	45122	34.79	340	449	789	Good

	North Circle	5	86	108430	57427	52.96	668	404	1072	Very Good
	Srinagar Circle	5	116	198845	98281	49.43	847	460	1307	Very Good
	Kashmir Region	17	334.6	436967	200830	45.96	600	437	1037	Very Good
2014-15	South Circle	9	177.34	144400	67873	47.00	383	338	721	Satisfactory
	North Circle	5	94	110780	56214	50.74	598	420	1018	Very Good
	Srinagar Circle	6	137	183027	96208	52.56	702	370	1072	Very Good
	Kashmir Region	20	408.34	438207	220295	50.27	539	376	915	Good
2015-16	South Circle	9	220.86	242364	92463	38.15	419	302	721	Satisfactory
	North Circle	5	97	128246	77732	60.61	801	472	1273	Very Good
	Srinagar Circle	7	163	217000	104649	48.23	642	380	1022	Very Good
	Kashmir Region	21	480.86	587610	274844	46.77	572	384	956	Good
2016-17	South Circle	7	137	171102	84142	49.18	614	351	965	Good
	North Circle	4	74	99868	55255	55.33	747	445	1192	Very Good
	Srinagar Circle	4	85	143688	65826	45.81	774	440	1214	Very Good
	Kashmir Region	15	296	414658	205223	49.49	693	412	1105	Very Good
2017-18	South Circle	14	251	240812	100995	41.94	402	306	708	Satisfactory
	North Circle	4	54	79930	49652	62.12	919	345	1264	Very Good
	Srinagar Circle	3	25.1	28065	16566	59.03	660	533	1193	Very Good
	Kashmir Region	21	330.1	348807	167213	47.94	507	394	901	Good
2018-19	South Circle	11	191.5	240344	113748	47.33	594	249	843	Good
	North Circle	6	104	150454	95257	63.31	916	413	1329	Very Good
	Srinagar Circle	5	78.5	126709	67056	52.92	854	372	1226	Very Good
	Kashmir Region	22	374	517507	276061	53.34	738	344	1082	Very Good
	South Circle	64	1260.3	1362614	581113	42.65	461	344	805	Good
	North Circle	34	634	853698	488507	57.22	771	422	1193	Very Good
	Srinagar Circle	35	694.6	1052509	535661	50.89	771	435	1206	Very Good
	Kashmir Region	133	2588.9	3268821	1605281	49.11	620	400	1020	Very Good

* 1001 and above plants per ha	Very Good
751 - 1000 plants per ha	Good
501-750 plants per ha	Satisfactory
≤ 500 plants per ha	Deficient

Based on the criteria of total density of plants (survived and natural regeneration), yearwise rating has been done of individual Circles in Kashmir region and presented in the above table.

Other Assests procured/created under CAMPA

The assets procured/created under CAMPA (2012-13 to 2018-19) in various divisions of Kashmir region were GPS instruments, computers/laptops, printers, inverters, Photostat machine, inverter, UPS, LED and vehicles, etc. Under civil works, BO huts, office buildings, guest houses, etc., were constructed. In the Kashmir region under CAMPA during 2012-13 to 2018-19, 47 GPS instruments, 3 Photostat machines, 55 computers, 17 printers, 1 Generator, 2 inverters, 10 UPS, 1 LED, 5 Vehicles and 232 Miscelleanous items for office uses were purchased. The equipments were verified in the various divisions by NHC team and all were found mostly functional and are serving the intended purpose. The civil works verified were also found mostly in good condition.

Output and Outcome

Output: The plantation made during 2012-13 to 2018-19 has shown a survival rate of 49.11% which can be considered as good in tough terrains. The primary output can be said to be success in terms of afforestation. The degraded forest lands and the barren hills have been rehabilitated through gap fillings resulting in increased density of plants. The man-days required right from advance work to plantation and maintenance has been catered through deployment of local community and hence employment has been generated to them. The soil moisture conservation work is instrumental in checking soil moisture runoff which in many places has resulted in improved vegetation and productivity in the impacted catchment area. Increased grass for cattle grazing is another output which is basic occupational need of the catchment area. Awareness on environment and climate change resilience has also increased through training and capacity building. The joint forest management network has increased through their capacity building.

Outcome: The interventions have been found to be sustainable in the long run. The areas treated will be producing substantial quantity of bio mass for community use in terms of fodder and fuelwood. The improved soil moisture regime will be recharging the ground water level to be supportive to the vegetation and natural growth of flora in the area. The growth of shrubs, medicinal plants and herbs will be supporting to the livelihood security in the area. The crown and ground density of the forests will keep on increasing through growth and regeneration of the plants planted. The well-stocked forests in the future will be checking floods and soil moisture run off. The expanded forests will be attracting more rain and hence agricultural and horticultural prosperity in the catchment area.

VII. Suggestions and Recommendations

Based on the comprehensive surveys, enumerations and field observations the consultants are submitting a set of suggestions as follows:

1. The Forest Department may strengthen the network of Village Forest Management Committees (VFMCs) in the plantation sites so that they get the benefits of usufruct sharing in due course of time and also protect the plantation areas. This will encourage local people for protection of plantations on principle of “Care and Share”.
2. Success of any plantation also depends on the nursery stock. It was found that some of the divisions are getting planting stock from other divisions or from central nurseries. The divisions should prefer to develop their own nursery stock close to plantation sites which may give better survival percent. In future plantations nurseries can be improved to produce quality saplings to minimise damage in transportation.
3. Success of plantation site is also dependent on the adaptability of species. Species - site matching to be assured and correct choice of species may avoid poor survival.
4. The data of plantations sites in most of the divisions is not up to the mark. It was observed during evaluation that closure journal of the sites is not maintained properly, as required. In the closure journals they have mentioned only name of species and total number, but not species wise numbers planted. This is required to

assess and monitor the actual survival % of the species. It is suggested that plantation/closure journals should be well maintained and updated periodically.

5. During field evaluation it was found that the casual labours engaged under CAMPA for protection of closure are not getting salary in time. This has led to lack of motivation for protection of plantations and has adversely affected some closures. This is one of the main reasons for poor growth and survival in some closures.
6. Grazing pressure is very high in Kashmir region particularly during summer season due to the migration of livestock by Bakarwals of Jammu region. Watch and ward which is very important for success of closure, has been provided for most of the plantation sites but there are incidences of damaging the fencing for grazing. The major demands of local communities were for watch and ward of the closure where it was absent. The department may also plan for establishing fodder banks to reduce the pressure of grazing.
7. Forest fire is a major threat to success of closure. Department may conduct workshops for field functionaries and other stakeholders to train them in fire fighting and protection measures. Mock exercises may also be conducted. The department should also pamphlets for Do's and Don'ts in the forest area, in local language and get it distributed among the inhabitants particularly residing in the forest fringe areas.
8. Fencing of plantation site also improves the chances of plantation survival. The field functionaries should monitor fencing of the closure site. Whenever reported, worn out of fencing may be corrected immediately by engaging staffs. This will be helpful not only in protecting ANR plantation but also natural regeneration of the area from grazing.
9. Capacity building is one of the main components that need to be focused by the department. The field functionaries may be well trained on aspects like selection of sites, choice of species to be planted, nursery development, seed selection, seed processing, record keeping and maintaining closure journal. Awareness camps may also be organised, particularly for the inhabitants of the closure sites, to make them aware of the benefits of plantation. Training and capacity building of community in plantation and allied activities will help both in afforestation as well as conservation.

10. The Divisional Forest Officer may also engage staffs for effective internal monitoring of the plantation sites, for at least first two years who will submit quarterly report on plantation sites. This practice will also enhance plantation survival. The DFOs/ Conservators and other higher officials should periodically inspect the sites and write their inspection note and the follow up against these inspection notes should be monitored by the concerned DFOs.
11. The J&K Forest Department may fix and organise a CAMPA day/week. On this occasion, the associated persons whether departmental/public who have done good work may be recognised, appreciated and awarded which will encourage others to participate and perform better.
12. The success story of CAMPA plantation should be identified at Division level every year. They should be documented and made available in public domain.
13. The plantation drives undertaken by the Social Forestry Division should be streamlined, reoriented and focused for rehabilitation and restoration of degraded forest patches instead of haphazard scattered plantations at school, roadsides in the name of plantation drives. All the stakeholders/voluntaries, schools, colleges NGO's or any other interested party must be encouraged for adaption of any degraded forest patch of their area for plantation.

Chapter 1: Background

1.1 Jammu & Kashmir in a Bird's Eye view

The Government of India vide notification dated 31.10.2019 has carved out two union territories of Jammu & Kashmir and Ladakh from the erstwhile State of Jammu & Kashmir. Situated in the northern- most part of the country, Jammu & Kashmir (UT) and Ladakh (UT), cover an area of 2,22,236 sq km, which is 6.76% of the geographical area of the country. The UT of Jammu & Kashmir is bordered by Pakistan in the west, UT of Ladakh is situated on the northern and eastern side and the States of Himachal Pradesh and Punjab lie South to the UT of Jammu & Kashmir. The UT of Ladakh has international border with Pakistan, Afghanistan and China. It shares borders with the UT of Jammu & Kashmir in the West and Himachal Pradesh in the South. The average annual rainfall varies from about 600 mm to about 800 mm and the average annual temperature from sub-zero to 40°C. The two UTs are drained by a number of rivers viz Jhelum, Chenab, Indus, Ravi, Tawi etc. All the 22 districts of UT of Jammu & Kashmir and two districts of UT of Ladakh are hill districts and both UTs do not have any tribal district. As per census 2011, the combined population of two UTs is 12.54 million accounting to 1.04% of India's population. The rural and urban population constitute 72.62% and 27.38% respectively. Tribal population is 11.91% of the UTs population. The average population density of the two UTs is 125 persons per sq km, which is lower than the national average. The 19th livestock census 2012 has reported a total livestock population of 9.2 million.

The typical features of the region are capsuled in the table 1.1:

Table 1.1 Land Use Pattern

Land Use Types	Area (in 000' ha)	%
Geographical Area	22,224	
Reporting area for land utilization	4,058	100.00
Forests	2,299	56.65
Not available for land cultivation	571	14.08
Permanent pastures and other grazing	113	2.77
Land under misc. tree crops and groves	57	1.39
Culturable wasteland	139	3.44
Fallow land other than current fallows	15	0.37
Current fallows	106	2.61
Net area sown	758	18.69

Source: Land Use Statistics, Ministry of Agriculture, GOI, (2014-15)

1.2 Forestry Scenario

As per the Champion & Seth Classification of Forest Types (1968), the forest in UT of Jammu & Kashmir and UT of Ladakh belong to eight Type Groups which are further divided into 42 Forest Types, the highest in the country. The Jammu & Kashmir Forest Act, 1987 is the only state-specific Forest/Wildlife act or rule that exists in the UTs. The two UTs have a Forest Protection Force to assist the Department in enforcing the forest laws on the ground and protection of forests and wildlife. The Forest Department of the two UTs have implemented various schemes focusing on rehabilitation of degraded forests, consolidation and demarcation, Eco Task Force, urban forestry, pasture and fodder development, stabilization of strip area on National Highways, development of Conifer Forests, CM's Participatory Afforestation Scheme, Integrated Forest Protection, participatory grazing land development programme etc. Literature indicates that 572 plant species belonging to 109 different families have medicinal value.

As per State of Forest Report 2019 issued by Forest Survey of India, the forest cover in Recorded Forest Area (RFA) in the two UTs is 20,230 sq km of which 17,643 sq km is Reserved Forests, 2,551 sq km is Protected Forest, and 36 sq km is Unclassed Forests.

The two UTs have so far notified 15,912 sq km under the Protection Area Network (PAN) which is 15.59% of the total geographical area of the combined UT, comprising five National Parks, 14 Wildlife Sanctuaries and 35 Conservation Reserves. The Protected Area (PA)

network of the two UTs is the highest in the country in terms of area, which is nearly 10% of the country's PA network.

1.2.1 Forest Types

Jammu and Kashmir have numerous chains of coniferous forests. With the increase in population of both human as well as livestock, the forests are under great pressure due to open grazing, heavy exploitation and excessive biotic dependence.

Some of the important forests of Jammu and Kashmir consist of deodar, willow, juniper, blue-pine, spruce, fir, yew, alder, elm, ash, sorrel, poplar, maple, birch, hazel, mulberry, silver-fir, cedar, beech, shisham, mohowa, jammun, bamboo, reed, numerous bushes, scrubs and grasses.

Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Sept 2017 to Nov 2017, the Forest Cover in the two UTs is 23,611.89 sq km which is 10.63% of the geographical area. In terms of forest canopy density classes, the UTs have 4,280.48 sq km under Very Dense Forest (VDF), 8,612.36 sq km under Moderately Dense Forest (MDF) and 10,719.05 sq km under Open Forest (OF). Forest Cover in the UTs has increased by 370.89 sq km as compared to the previous assessment reported in ISFR 2017.

Table 1.2 Combined Forest Cover of UTs of Jammu & Kashmir and Ladakh

Class	Area (in sq km)	% of GA
VDF	4,280.48	1.93
MDF	8,612.36	3.88
OF	10,719.05	4.82
Total	**23,611.89**	**10.63**
Scrub	547.54	0.25

The district-wise forest cover in the UT of Jammu and Kashmir is given in table 1.3.

Table 1.3 District- wise Forest Cover in Jammu & Kashmir, UT

(in sq km)

District	Shape File Area #	2019 Assessment				% of Shape File Area	Change wrt 2017 assessment	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Anantnag[H]	2,727	126.55	455.28	492.36	1,074.19	39.39	49.19	0.77
Badgam[H]	1,250	100.85	76.04	164.95	341.84	27.35	49.84	16.00
Bandipura[H]	2,676	270.85	177.16	194.83	642.84	24.02	34.84	3.53
Baramula[H]	2,062	287.57	211.90	370.79	870.26	42.20	63.26	7.05
Doda[H]	2,411	327.98	703.50	454.45	1,485.93	61.63	-30.07	0.40
Ganderbal[H]	1,620	129.36	179.13	186.01	494.50	30.52	58.50	6.58
Jammu[H]	2,407	0.00	241.41	526.22	767.63	31.89	22.63	35.54
Kathua[H]	2,512	108.16	607.96	615.32	1,331.44	53.00	-3.56	6.59
Kishtwar[H]	8,179	235.96	716.41	832.68	1,785.05	21.82	-20.95	5.82
Kulgam[H]	1,265	84.92	99.00	206.32	390.24	30.85	32.24	4.98
Kupwara[H]	2,744	783.42	408.34	273.19	1,464.95	53.39	-17.05	1.22
Mirpur[H]	3,759	0.00	484.66	753.13	1,237.79	32.93	12.79	41.56
Muzaffarabad[H]	4,663	873.97	441.86	293.20	1,609.03	34.51	-12.97	47.48
Pulwama[H]	896	15.70	117.72	240.72	374.14	41.76	70.14	5.60
Punch[H]	4,244	332.28	1,121.33	654.10	2,107.71	49.66	2.71	10.06
Rajauri[H]	2,635	42.04	424.48	838.78	1,305.30	49.54	0.30	7.43
Ramban[H]	1,288	70.55	287.17	308.52	666.24	51.73	-14.76	0.53
Reasi[H]	1,932	234.54	393.58	470.29	1,098.41	56.85	-4.59	12.37
Samba[H]	921	0.00	124.26	207.53	331.79	36.02	18.79	12.59
Shupiyan[H]	505	62.50	37.22	224.33	324.05	64.17	46.05	1.00
Srinagar[H]	282	0.24	20.03	24.97	45.24	16.04	18.24	0.00
Udhampur[H]	2,280	115.42	624.03	634.57	1,374.02	60.26	-27.98	22.45
Grand Total	**53,258**	**4,202.86**	**7,952.47**	**8,967.26**	**21,122.59**	**39.66**	**347.59**	**249.55**

 # Area of shape file provided by Survey of India (December, 2019). Notified geographical area from SOI awaited.

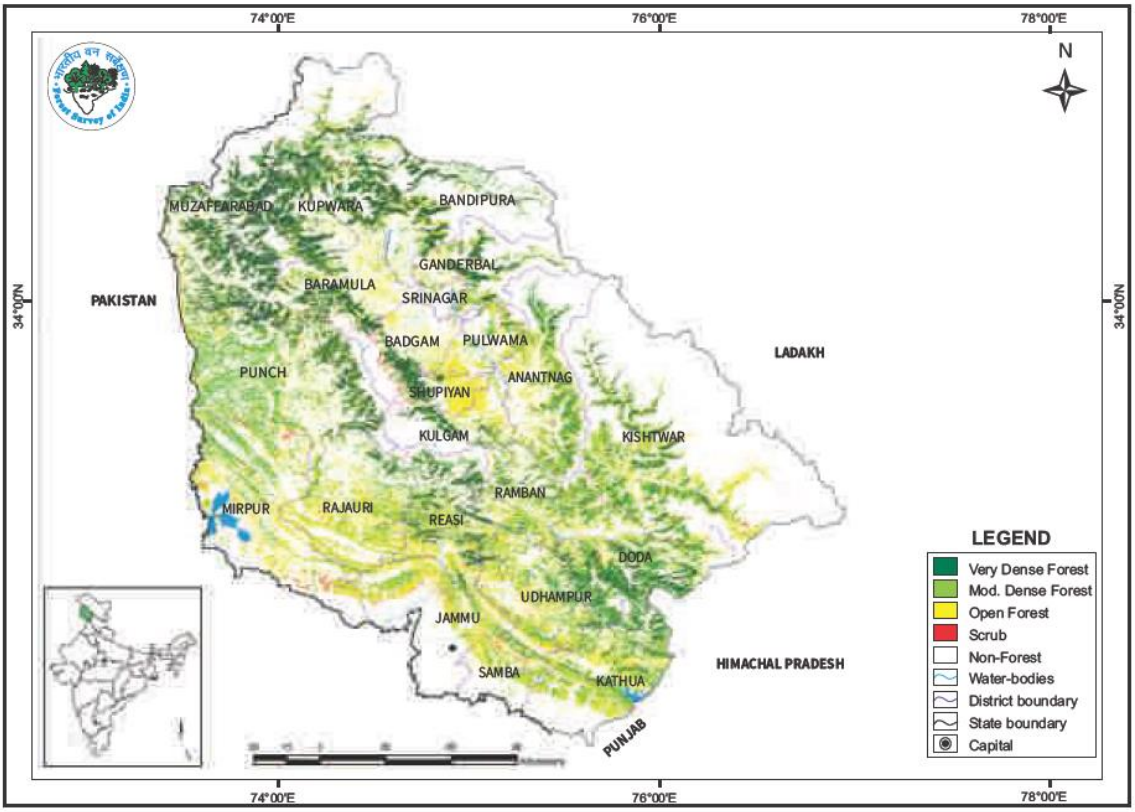


Exhibit 1: Forest Cover Map of Jammu and Kashmir

1.2.2 Recorded Forest Area

Broadly, five types of forest are found in Jammu & Kashmir viz., Subtropical Dry Evergreen, Himalayan Moist Temperate, Himalayan Dry Temperate, Subtropical Pine and Sub-alpine and alpine forests. The Forest Type Maps of 2011 have been refined in the recently completed exercise by FSI. Percentage area under different forest types of UTs of Jammu & Kashmir and Ladakh (combined) as per the Champion & Seth classification (1968), according to the latest exercise are presented in the following table.

Table 1.4: Forest Cover in Different Forest Type Groups

Sl.No.	Forest Type	% of Forest cover
1	5B/C2 Northern Dry Mixed Deciduous Forest	6.17
2	5B/DS1 Dry Deciduous Scrub	1.89
3	5/DS3 (*Euphorbia* Scrub)	0.01
4	5/E9 Dry Bamboo Brake	0.12

Sl.No.	Forest Type	% of Forest cover
5	5/1S2 *Khair-Sissu* Forest	0.02
6	9/C1a Lower or Siwalik Chir Pine Forest	10.8
7	9/C1b Upper or Himalayan Chir Pine Forest	4.27
8	9/DS1 Himalayan Subtropical Scrub	1.27
9	10/C1a *Olea Cuspidata* Scrub Forest	0.65
10	10/C1/DS1 Dodonaea Scrub	0.03
11	10/C1b Acacia Modesta Scrub Forest	0.04
12	12/C1a Ban Oak Forest (Q. incana)	2.75
13	12/C1b Moru Oak Forest (Q. dilatata)	0.16
14	12/C1/DS1 Oak Scrub	0.48
15	12/C1c Moist Deodar Forest (Cedrus)	8.93
16	12/C1d Western Mixed Coniferous Forest (Spruce, Blue Pine,	12.82
17	12/C1e Moist Temperate Deciduous Forest	0.12
18	12/C1f (Low-Level Blue Pine Forest (P. wallichiana))	6.47
19	12/C1/DS2 Himalayan Temperate Secondary Scrub	0.64
20	12/C2a Kharsu Oak Forest (Q. semecarpifolia)	0.00
21	12/C2b West Himalayan Upper Oak/Fir Forest	0.01
22	12/DS3 Himalayan Temperate Pastures	1.80
23	12/1S1 Alder Forest	0.02
24	12/1S2 Riverain Blue Pine Forest	0.21
25	12/2S1 Low-Level Blue Pine Forest	0.19
26	13(i)/C1 Dry Broadleaved and Coniferous Forest (Q. ilex-P.	2.55
27	13(i)/C2b Dry Deodar Forest (Cedrus)	3.12
28	13/C2/DS1 Pohu Scrub	0.24
29	13/C2/DS2 Dry Temperate Scrub	0.52
30	13(i)/C3 (West Himalayan Dry Temperate Deciduous Forest)	0.91
31	13(i)/C4 West Himalayan High-Level Dry Blue Pine Forest	4.83
32	13/1S2 Populus / Salix Forest	0.48
33	14/C1a West Himalayan Sub-Alpine Fir Forest	4.36
34	14/C1b West Himalayan Sub-Alpine Birch/Fir Forest	5.57

Sl.No.	Forest Type	% of Forest cover
35	14/DS1 Sub-Alpine Pastures	0.30
36	14/2S1 (Sub-Alpine Blue Pine Forest (P. wallichiana))	1.05
37	15/C1 Birch/Rhododendron Scrub Forest	0.56
38	15/C2 Deciduous Alpine Scrub	0.49
39	15/E1 Dwarf Rhododendron Scrub	0.04
40	15/C3 (Alpine Pastures)	2.37
41	16/C1 Dry Alpine Scrub	5.02
42	16/E1 Dwarf Juniper Scrub	2.82
43	Plantation/ TOF	4.84
	Total	100.00

Kashmir region has 3 forest circles as shown in exhibit 3.

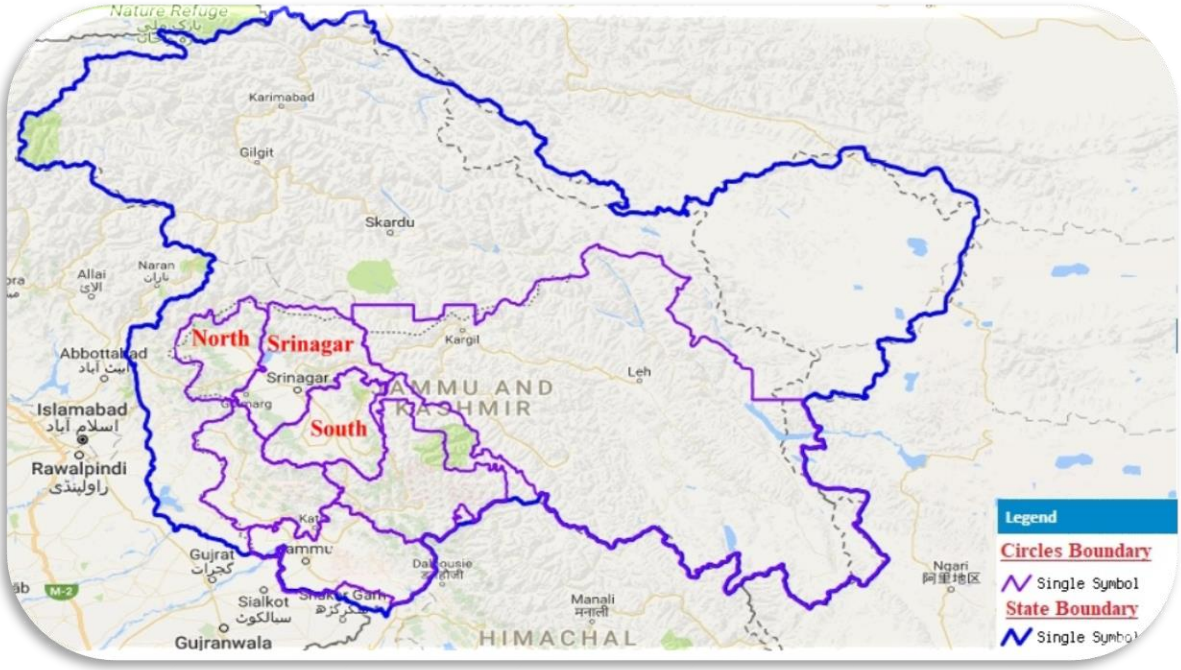


Exhibit 3: Map Showing Forest Circles of Kashmir Region

The details of the forest divisions in each of the circles is given in the following table:

Table 1.5: Division-wise Forest Area in Kashmir and Jammu Region

Region	Forest Circle	Forest Division		Area in ha
a) Kashmir	Srinagar Circle	Budgam/Tangmarg		76588
		Sindh		37956
		Bandipora		199396
		Total		**313934**
	South Circle	Shopian	Kulgam	81270
		Anantnag		96016
		Lidder		106591
		Total		**283877**
	North Circle	Langate		35495
		Kamraj		71146
		Kehmil		62472
		Baramulla		45906
		Total		**215019**
	Central Circle	Leh		2937
		Kargil		651
		Total		**3588**
	Sub-Total Kashmir			**816418**
b) Jammu	East Circle	Jammu		79289
		Kathua		46364
		Billawar		68247
		Ramnagar		37065
		Udhampur		60465
		Total		**291430**
	West Circle	Poonch		95137
		Rajouri		71456
		Nowshera		58600

		Reasi	45039
		Mahore	89563
		Total	**359795**
	Chenab Circle	Kishwar	138775
		Bhaderwah	89116
		Doda	62146
		Ramban	48279
		Batote	31631
		Marwah	185451
		Total	**555398**
	Sub-Total Jammu		**1206623**
	Total Jammu & Kashmir		**2023041**

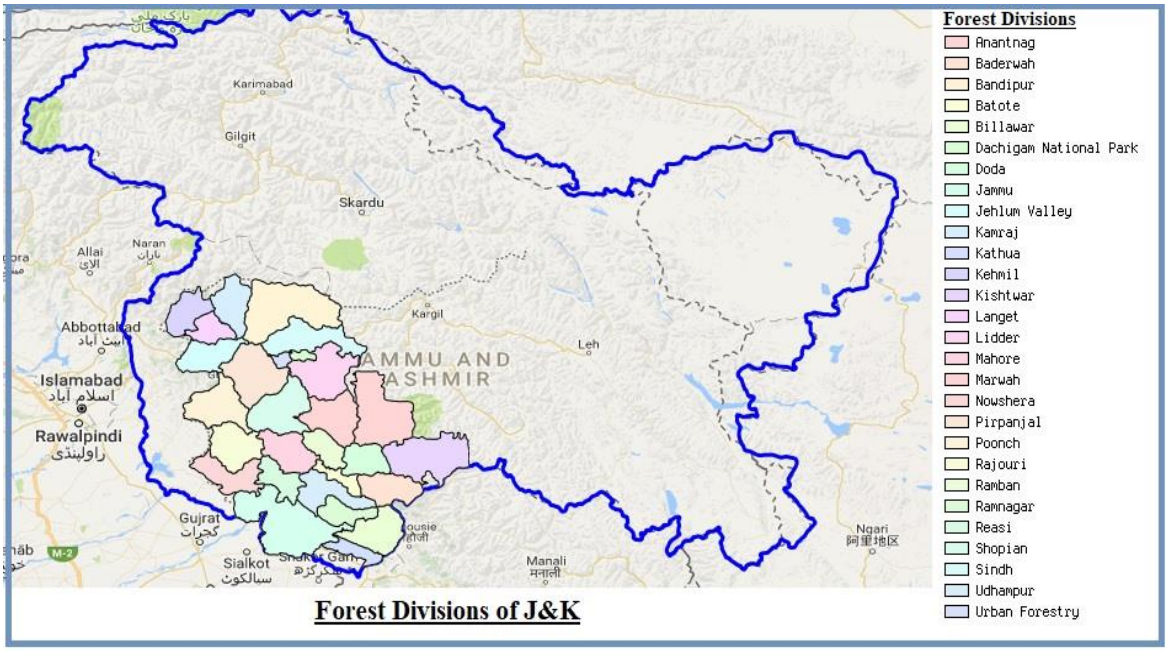


Exhibit 4: Map showing Forest Divisions of J & K

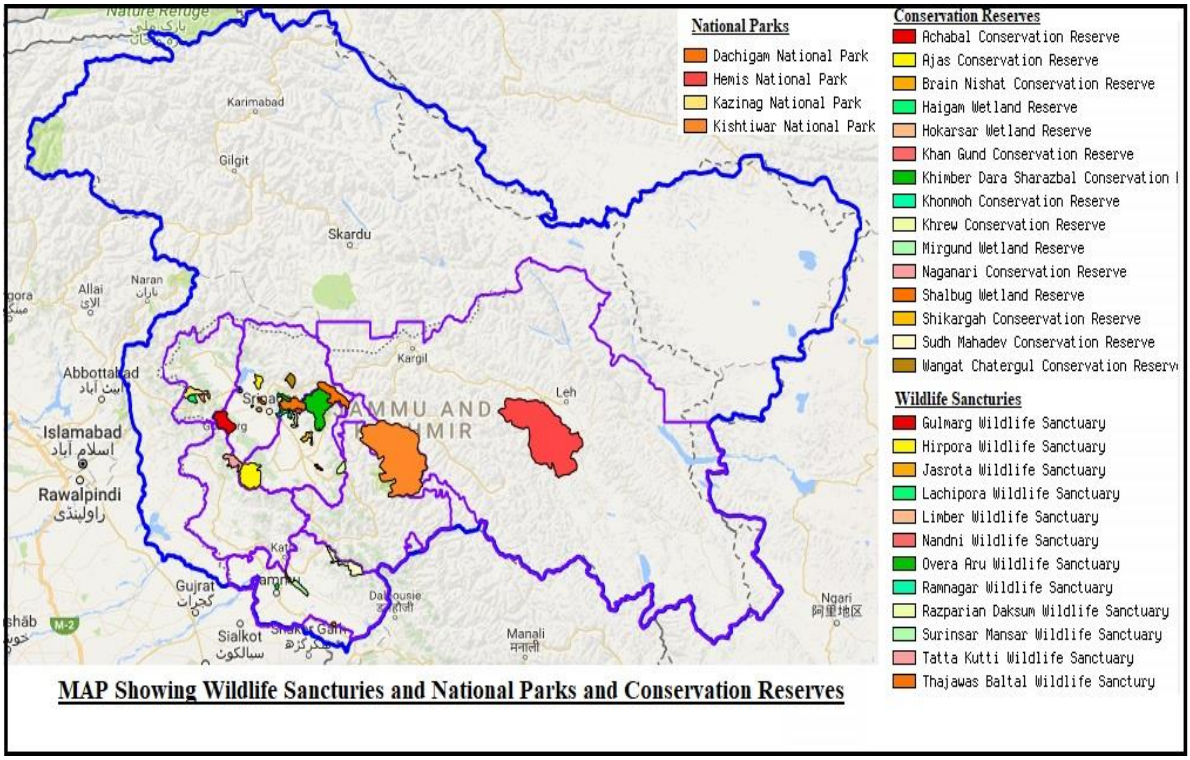


Exhibit 5: Map showing Wildlife Sanctuaries, National Parks and Conservation Reserves

1.3 Activities of Forest Department

The Forest Department activities involve raising economic plantations and quick growing species under various schemes of centre and state governments.

i) Rehabilitation of Degraded Forests
ii) Research Education and Training
iii) Working Plan and Research
iv) Consolidation and Demarcation
v) Development of Minor Forest Produce including Medicinal Plants
vi) Eco Task Force
vii) Infrastructure including Gutted Buildings
viii) Urban Forestry
ix) Pasture and Fodder Development
x) Stabilization of slip Areas on National Highway
xi) CM's Participatory Afforestation Scheme
xii) Forest Protection

xiii) Monitoring and Evaluation

xiv) Participatory Grazing Land Development Programme

xv) Integrated Forest Protection Scheme

1.4 Creation of CAMPA

When Forest Conservation Act 1980 was enacted, to replenish the lost forest area, a component of compensatory afforestation was provided, for which funds were to be deposited with the State Forest Department to be used for raising compensatory plantations. Later on, the component of funds for additional compensatory afforestation, catchment area treatment plan and for any other complaints was also included. Most importantly, component of Net Present Value (NPV), regulated by Honorable Supreme Court order dated 30-10-2002 in I.A. No. 566 in Writ Petition (C) No. 202 of 1995, was also introduced. Thus, necessity arose of managing this huge fund and therefore, in pursuance of above order of the apex court, Govt. of India constituted Compensatory Afforestation Fund Management and Planning Authority (CAMPA) under sub-section 3 of section 3 of Environment Protection Act 1986 (29 of 1986) on 3rd April 2004. Subsequently, the Honorable Supreme Court ordered to State of Jammu & Kashmir also to constitute similar fund. In 2004, MoEF issued directions to all states to constitute State CAMPA. In response to this, Govt. of Jammu & Kashmir constituted two committees- a State Level Management Committee (SLMC) and another State Level Steering Committee (SLSC) in 2005. SLSC in Feb 2006 decided that money available under CAMPA account would not be transferred to Central Ad-hoc CAMPA, because Jammu & Kashmir has its own Forest (Conservation) Act. On the recommendation of Central Empowered Committee (CEC), Honorable Supreme Court issued the direction in this regard in 2012. In the mean time, Govt. of Jammu & Kashmir, through SRO 354 dated 11th Nov 2009 constituted State CAMPA and issued operational guidelines to operate the scheme in first instance, for five years from 2010-11 to 2014-15. The salient features of the State CAMPA are:

i) It has three Committees namely, Governing Body (under the Chairmanship of Honorable Chief Minister), Steering Committee (with Chief Secretary as Chair person) and Executive Committee (headed by PCCF).
ii) Powers & functions of all the committees are mentioned.
iii) Aims & Objectives and strategy has been defined.
iv) Implementing agency is the different units of the department, but with the help of people's Vigilance and Monitoring Committee (VMCs) at village level.
v) Social audit as well evaluation by independent agency or consultant to be done every year.

The evaluation of plantation work & activities done under CAMPA is to be done by an independent agency. The present study has been assigned to NH Consulting Pvt. Ltd, as a third-party evaluator for evaluation of the plantation activities carried out during the years 2012-13 and 2018-19 under CAMPA funds, in South, North and Srinagar Circles of Kashmir Region.

Chapter 2: Compensatory Afforestation Fund Management and Planning Authority (CAMPA)

2.1 The Project Dimensions

With a cover of 23% of geographical area of the country, forest in India comprise of a number of diverse forest types and reserved areas designated as National Parks and Wildlife Sanctuaries. In India, forests meet the livelihood needs of people living in and adjoining the forests in about 1,73,000 villages. Forests also act as carbon sinks and regulators of water regime.

Many development and industrial projects such as erection of dams, mining, and construction of industries or roads require diversion of forest land. Any project proponent, government or private must apply for forest clearance from Ministry of Environment and Forests (MoEF), before the conversion of land take place. This proposal is to be submitted through the concerned forest department of the state government. If clearance is given, then compensation for the lost forest land is also to be decided by the ministry and the regulators.

- The State CAMPA would presently receive funds collected from user agencies towards compensatory afforestation, additional compensatory afforestation, penal compensatory afforestation, Net Present Value (NPV) and all other amounts recovered from such agencies under the Forest (Conservation) Act, 1980 and presently lying with the Adhoc CAMPA. The State CAMPA would administer the amount received from the Adhoc CAMPA and utilize the funds collected for undertaking compensatory afforestation, assisted natural regeneration, conservation and protection of forests, infrastructure development, wildlife conservation and protection and other related activities and for matters connected therewith or incidental thereto.

- State CAMPA would provide an integrated framework for utilizing multiple sources of funding and activities relating to protection and management of forests and wildlife. Its prime task would be regenerating natural forests and building up the institution engaged in this work in the State Forest Department including training of the forest officials of various levels with an emphasis on training of the staff at cutting edge level (forest range level). In short, the department would be modernized to protect and regenerate the forests and wildlife habitat.

The guidelines also talk about establishment of an independent system for concurrent monitoring and evaluation of the works implemented in the States utilizing the funds available.

2.2 Project Objectives

Compensatory Afforestation Fund Management and Planning Authority is meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses. National CAMPA Advisory Council has been established as per the orders of the Hon'ble Supreme Court with the following mandate:

- Regularly monitor and evaluate, in consultation with States, projects being undertaken by State CAMPA.
- Facilitate scientific, technological and other assistance that may be required by State CAMPA.
- Make recommendations to the State CAMPA based on review of their plans and programmes.
- Provide a mechanism to the State CAMPA to resolve issues of an inter-state or Centre-State character.
- Shall have the powers to order special inspection and financial audit of works executed by the State CAMPA by utilizing CAMPA money.

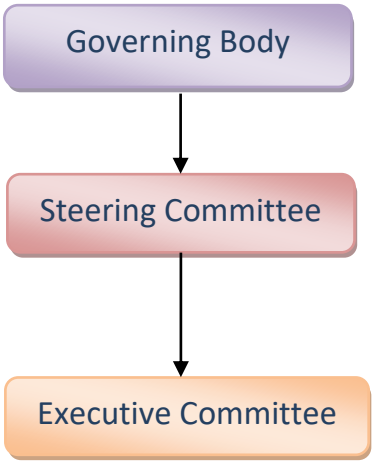
2.3 Project Components

The project has following major components:

- Conservation, protection, regeneration and management of existing natural resources;
- Conservation, protection and management of wildlife and its habitat within and outside protected area including the consolidation of the protected area;
- Compensatory afforestation;
- Environment services which includes:
    - Provision of goods such as wood, non-timer forest produce, fuel, fodder & water and provision of services such as grazing, tourism, wildlife protection and life support;
    - Regulating services such as climate regulation, disease control, flood moderation, detoxification, carbon sequestration and health of soil, air and water regimes;
    - Non-material benefits obtained from ecosystem, spiritual, recreational, aesthetic, inspirational, educational and symbolic; and
    - Supporting such other services necessary for the production of ecosystem services, biodiversity, nutrient cycling and primary production.
- Research, Training and Capacity Building;
- Protection and conservation of natural resources through active participation /involvement of people;
- Checking land degradation depreciation and loss of bio-diversity.

2.4 Project Management Structure

The State Government established the Compensatory Afforestation Fund Management and Planning Authority (State CAMPA) in the State. At the state level, CAMPA is comprised of a Governing Body, Steering Committee, Executive Committee and a Monitoring Group. The Governing body of the State CAMPA is headed by the Head of the State as Chairperson, Ministers of Forests, Finance, Planning, Chief Secretary, Principle-Secretary (Finance), Principle Secretary (Planning), Principal Chief Conservator of Forests, Chief Wild Life Warden as members and Secretary (Forests) as Member Secretary. The Governing Body lays down the broad policy framework for the functioning of State level CAMPA and reviews its working from time to time.



The Steering Committee of State CAMPA is headed by Chief Secretary as Chairperson, Principal Chief Conservator of Forests, Principal Secretary Forests, Finance and Planning, Chief Wildlife Warden, Nodal Officer, a representative of the Ministry of Environment & Forests, two eminent NGO's nominated by the State Government as members and Chief Conservator of Forests (Plan/Schemes) as Member Secretary. The Steering Committee is responsible to lay down and / or approve rules and procedures for the functioning of the body and its Executive Committee (ii) monitor the progress of the utilization of funds released by the State CAMPA; (iii) approve the Annual Plan of Operation (APO) prepared by the Executive Committee; (iv) approve the annual reports and audited accounts of the State CAMPA; (vi) ensure inter-departmental coordination.

The Executive Committee is headed by Principal Chief Conservator of Forests as Chairperson, Chief Wildlife Warden, Chief Conservator of Forests (Plan/Schemes), Financial Controller/Financial Adviser in the O/o the Principal Chief Conservator of Forests, two eminent NGO's to be nominated by the State Government for a period of 2 years as member and Nodal Officer as Member Secretary. The State Level Executive Committee is responsible to take all steps for giving effect to the State CAMPA and overarching objectives and core principles, in accordance with rules and procedures approved by the Steering Committee and the approved APO; prepare the APO of the State for various activities, submit it to the Steering Committee before end of December for each financial year, and

obtain the Steering Committee's concurrence for release of funds, while giving break-up of the proposed activities and estimated costs; supervise the works being implemented in the State out of the funds released from the State CAMPA; be responsible for proper auditing of both receipt and expenditure of funds; develop the code for maintenance of the account at the implementing agency level; submit reports to the Steering Committee for review / consideration; and prepare Annual Report by end-June for each financial year.

An independent system for concurrent monitoring and evaluation of the works implemented in the States utilizing the funds available is evolved and implemented to ensure effective and proper utilization of funds. The National CAMPA Advisory Council have the powers to order special inspection and financial audit of works executed by the State CAMPA with utilizing CAMPA money. If satisfied that the funds released are not being utilized properly, the National CAMPA Advisory Council as well as the State Level Steering Committee has the power to withhold or suspend the release of remaining funds or part thereof.

Chapter 3: The Evaluation Study

3.1 The Backdrop

Under CAMPA, several activities have been taken up for conservation and development of natural forests, afforestation of degraded forest areas, forest protection, forest fire management, management of wildlife habitat, capacity building, research & development, infrastructure development and other allied activities from 2010-11 till now. There was a need to technically evaluate these activities. Therefore, the State CAMPA decided for third party evaluation of the CAMPA works undertaken as per Annual Plan of Operations (APO) of 2012-13 to 2018-19.

3.2 Evaluation/ Study

As part of project M&E, external evaluation/study is to be conducted for all projects taken up under JK CAMPA related to afforestation, soil and moisture conservation, habitat improvement and the like, in Jammu region. Projects taken up in forest areas need special evaluation focus as these are taken up in difficult terrain in remote locations where full participation of stakeholders and other means of verification is often difficult.

3.3 Scope of Work

The universe of the study spans over all the works executed under different components of CAMPA during 2012-13 to 2018-19 in all the Forest Divisions of the State by the Forest Department (Territorial) and allied departments namely,

- Wildlife Protection Department;
- Social Forestry Department;
- Soil and Water Conservation Department;
- State Forest Research Institute;
- Ecology Environment and Remote Sensing Department;
- Forest Protection Force.

These above mentioned departments fall in the three circles namely South, North and Srinagar Circle of Kashmir region.

The major activities undertaken by State CAMPA include plantations, management of wildlife and its habitat, soil and water conservation, development of infrastructures, demarcation and capacity building activities.

The broad scope of work includes, but not limited to:

- Field verification and validation of plantations and nurseries and quality of work done.
- Field verification and validation of Water Conservation Structures, closures, and assets created.
- Verification of related documents such as micro plan, plantation journal, plantation card, design and estimate for SMC and building construction, store register and other necessary supporting documents in relation to the field situation and periodical progress reports submitted.
- Assessment of the procedures/norms of procurement, construction, plantation, payment and any other proceedings for asset creation in relation to the guideline and procedures laid down under the project or defined by the government.
- Suggest Improvements.

The items to be verified and validated, but not limiting to, include:

Forestry & biodiversity conservation related activities	Construction	Record Keeping
– Survival rate of plantations under various models – In situ soil and moisture conservation, Boundary demarcation and Fencing – Wildlife Habitat Improvement – Biological parks – Eco-sites – Usufruct sharing	– Water conservation structures including Drainage Line Treatment and water points – Structures made under Entry Point Activity – Renovation of traditional water harvesting structures – Building Works-Office, Residential quarter, Barricade, Forest Camp, Pump Houses, etc.	Record to be checked – Survey map/ treatment map – Micro plan – Plantation journal – Plantation card – Site estimate – Transparency board – VFPMC/EDC/SHGs records

3.4 Study Team and Manpower Deployment

The study team consisted of field teams under able guidance and direction of a multidisciplinary team of experts. The expert team was responsible for conceptualisation, planning, direction, expert observation and overall coordination. The expert's responsibilities also included the tasks of designing of methodology, designing of formats for collection of data from field, pilot field study, planning and execution of field data collection from plantation sites, analysis of data collected from field for interpretation of results and compilation of the evaluation report. The field teams consisted of field enumerators who were responsible for collection of data (physical measurements and ocular observations), FGD with local community, checking of documents at Division and Range level from sample sites being evaluated. In the Kashmir South Circle, a team of 5 field enumerators (team 1) were deputed for data collection work whereas; 5 field enumerators (team 2) were deputed in the Kashmir North and Srinagar Circle. The field enumerators were accompanied by skilled assistants for assisting in enumeration of all trees planted in a closure/site. After selecting the closure, the whole area was to be divided into sections, one allotted to each enumerator. Local staffs (mostly Block Officers) were always with the evaluation team so that they could verify the authenticity and correctness of the data collected. Each team of field enumerators was supervised by a circle coordinator.

Chapter 4: Methodology

4.1 General

The evaluation study was conducted through a combination of secondary as well as primary research. However, the prime focus was laid on the primary research which inter- alia included enumeration of the plantations, growth parameter measurement, community interviews, PRA, experts' observation of water harvesting structures and also interactive consultation with the tertiary and the secondary sector stakeholders.

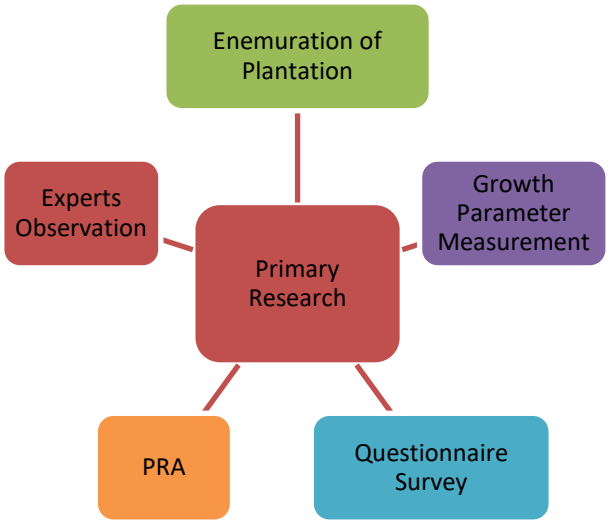
4.2 Secondary Research

The secondary research exercise was aimed at soliciting information from published sources which inter-alia will include:

- Working plans;
- Site specific planning documents (micro plans if any);
- Plantation journals;
- Measurement books;
- Bill of materials;
- Proceeding of the meetings – at committee, tertiary level;
- Progress Reports if any;
- Catchment area treatment plan if any;
- CAMPA annual reports;
- Inspection and follow up notes;
- District statistical handbooks; etc.

4.3 Primary Research

A five-dimension primary research was applied to solicit information on the actual position of the interventions at present. These were:



Primary data collection was done by physical measurements and observations in sample sites. Data pertaining to area, location, species planted, their numbers and survival, height and girth of plants, vigour of the plants, fencing and other maintenance activities, biotic pressure, site suitability and overall performance etc. was collected by the field enumerators and recorded. Besides, FGDs were conducted amongst the nearby inhabitants of the CAMPA closure sites for primary data collection with respect to the participation of community of the area in planning and execution of activities, demographic details, dependence on nearby plantation closure, issues and suggestions from the villagers, usufruct rights and benefit sharing mechanism.

4.3.1 Enumeration of Plantation

The sites selected through sampling method discussed in the proceeding paragraphs were enumerated. The enumeration was done species wise by counting the surviving trees. A typical enumeration sheet designed for the purpose is attached as Annexure-1.1.

4.3.2 Growth Parameter Measurement

Growth of surviving plants was measured in terms of their height and girth. Girth of the plants was measured at collar height if, the plants are below 2 m in height. The plants above 2 m were measured at the breast level for their girth. In case, the plants were infancy (at sapling level), their growth was measured through vegetative observations that is growth of leaves. The plants height for taller plants was measured using single pole method. The relevant measurement tapes for both height and girth were also used for the purpose. The measurement sheet as recording tool is presented in Annexure-1.1.

4.3.3 Questionnaire Survey

There were multiple types of questionnaires, checklist and PRA facilitation sheets used to solicit the stakeholder's opinion. These survey tools are presented in Annexure-1.1 to 1.10. The opinion solicitation through these tools were made using probing exercise.

4.3.4 PRA/FGD

The participatory rural appraisal was conducted on each sample sites to understand the interventions process, practices, outcomes and outputs. The PRA was also focussed on understanding the level of community participation, conflict resolutions, social risks and overall transparency in project implementation. Inclusion of community demand in project interventions was also appraised through this exercise. The PRA was conducted after a transact walk by the consultants in the forests, plantation areas and other parts of interventions. A mixed social, gender and age group of villagers were made to participate in PRA/FGD. The PRA facilitation sheet is enclosed as Annexure-1.9.

4.3.5 Expert Observation

The multidisciplinary experts visited the sites mainly to understand suitably of the interventions and their outcome. The experts team focussed on the technical aspects of the afforestation works undertaken, water harvesting structures, soil moisture conservation work, assets created under EPA, assets created under project, working of JFMCs, SHGs, the process adopted for meetings, consensus building etc. The Evaluation Data Sheets addressing each of the above components are given in Annexure-1.

4.4 Sampling

About 10 % of the sites of CAMPA were covered for the current evaluation study. Before visiting the closure for monitoring, all the records pertaining to the plantation were obtained from the Range Headquarter and Closure Journal from the Block In-charge or from the Forest Guard. Apart from actual counting of the planted seedlings and recording height and girth of various species, observation regarding soil conservation measures and fencing were also made. A complete enumeration of all seedlings planted during the years 2012-13 to 2018-19 in each of the sampled sites was conducted. Inside each sampled site, five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site were laid for detailed monitoring and evaluation, i.e. measurement of growth, height, girth, crown conditions and for capturing the status of rejuvenation and regeneration of the plantation area.

Chapter 5: Observations from the Field

A total of 133 sites in 23 divisions of 3 circles, namely, South Circle (64 sites), Srinagar Circle (35 sites) and North circle (34 sites) for the work done under CAMPA during the year 2012-13 to 2018-19 were evaluated. As per records, a total of 32,68,821 plants were planted in three circles of Kashmir region. In terms of survival, in the 133 sites of 3 circles, a total of 16,05,281 plants were recorded on the ground belonging to 36 species including fruit trees, medicinal and ornamental plants, which gave an overall average of 49.11% in all the three circles. The Circle-wise observations are discussed in the proceeding paragraphs.

5.1 Kashmir South Circle

For the purpose of finding out the overall survival of different species in Kashmir South Circle, a total of 11 divisions were considered. 64 sites of CAMPA established during the year 2012-13 to 2018-19 at 11 divisions were taken up for monitoring and evaluation. The best five important species which survived in these divisions is ranked and given in table below.

Table 5.1 Species wise survival in different divisions

S. No.	Division	Species	Rank
01	Anantnag	*Cedrus deodara*	1
		Pinus wallichiana	2
		Robinia pseudoacacia	3
		Cupressus	4
		Malus domestica	5
02	Anantnag(Social Forestry)	*Robinia pseudoacacia*	1
		Cedrus deodara	2
		Ulmus wallichiana	3
		Pinus wallichiana	4
		Malus domestica	5

S. No.	Division	Species	Rank
03	Anantnag (Soil & Water Conservation)	*Robinia pseudoacacia*	1
		Ulmus wallichiana	2
		Pinus wallichiana	3
		Cedrus deodara	4
		Cupressus	5
04	Anantnag (wildlife)	*Malus domestica*	1
		Prunus armeniaca	2
05	Awantipora	*Cedrus deodara*	1
		Prunus armeniaca	2
		Pinus wallichiana	3
		Robinia pseudoacacia	4
		Malus domestica	5
06	Kulgam	*Pinus wallichiana*	1
		Cedrus deodara	2
		Robinia pseudoacacia	3
		Malus domestica	4
		Ulmus wallichiana	5
07	Lidder	*Cedrus deodara*	1
		Robinia pseudoacacia	2
		Pinus wallichiana	3
		Ulmus wallichiana	4
		Fraxinus pennsylvanica	5
08	Pulwama (Social Forestry)	*Pinus wallichiana*	1
		Cedrus deodara	2
		Robinia pseudoacacia	3
		Malus domestica	4
		Prunus armeniaca	5
09	Shopian	*Robinia pseudoacacia*	1
		Cedrus deodara	2

S. No.	Division	Species	Rank
		Pinus wallichiana	3
		Ulmus wallichiana	4
		Malus domestica	5
10	Shopian (Soil & Water Conservation)	*Cedrus deodara*	1
		Pinus wallichiana	2
		Ulmus wallichiana	3
		Robinia pseudoacacia	4
		Aesculus indica	5
11	Shopian (Wildlife)	*Malus domestica*	1
		Prunus armeniaca	2
		Prunus persica	3
		Rubus idaeus	4
		Cupressus	5

Further, if all the species of the plants planted in different divisions are clubbed together, then the species-wise survival ranking works out to be as under:

Table 5.2 Species wise survival ranking

S. No.	Species	Rank
1	*Abies pindrow*	14
2	*Aesculus indica*	8
3	*Alkanna tinctoria*	18
4	*Bergenia ciliate*	11
5	*Cedrus deodara*	2
6	*Cupressus*	9
7	*Digitalis purpurea*	19
8	*Dioscorea deltoidea*	10

S. No.	Species	Rank
9	*Fraxinus pennsylvanica*	7
10	*Lavatera kashmeriana*	20
11	*Malus domestica*	5
12	*Picea smithiana*	15
13	*Pinus wallichiana*	3
14	*Platanus orientalis*	24
15	*Podophyllum hexandrum*	12
16	*Prunus armeniaca*	6
17	*Prunus domestica*	22
18	*Prunus persica*	13
19	*Quercus robusta*	23
20	*Robinia pseudoacacia*	1
21	*Rosaceae*	25
22	*Rubus idaeus*	16
23	*Trillium govanianum*	21
24	*Ulmus wallichiana*	4
25	*Valeriana wallichii*	17

Division with Highest Survival Percentage: Among the plantations of 2012-13 to 2018-19, Lidder Division of South Circle had shown the highest survival percentage of 66.75%. The ten prominent species of the division are given in the following table.

Table 5.3 Division having best survival percentage

S. No.	Species	Surviving (Nos.)	Rank
1	*Cedrus deodara*	27707	1
2	*Robinia pseudoacacia*	26068	2

3	*Pinus wallichiana*	23935	3
4	*Ulmus wallichiana*	20429	4
5	*Fraxinus pennsylvanica*	18715	5
6	*Cupressus*	6556	6
7	*Aesculus indica*	4462	7
8	*Dioscorea deltoidea*	4243	8
9	*Prunus armeniaca*	3815	9
10	*Bergenia ciliate*	3783	10

Closure with best survival percentage: Among the sampled closures, the best survival percentage has been recorded in closure 18L (2012-13) of Mattan Range of Lidder Division which is 80.84% and the details is produced in the table 5.4.

Table 5.4 Closure having best survival percentage

S. No.	Species	Surviving (Nos.)	Survival %
1	*Cedrus deodara*	3251	8.80
2	*Pinus wallichiana*	3524	9.54
3	*Cupressus*	2101	5.69
4	*Robinia pseudoacacia*	7125	19.28
5	*Ulmus wallichiana*	6422	17.38
6	*Fraxinus pennsylvanica*	6126	16.58
7	*Aesculus indica*	1322	3.58

However, in Pulwama Social Forestry Division, the survival percentage of 82.80% (2018-19) at railway station Kakpora Pulwama was also recorded against the plantation size of 250, but this was in the shape of narrow strips and hence not included in best performing.

Division having Least Survival Percentage: Among the plantations of 2012-13 to 2018-19, the least survival percentage was recorded as 12.29% in Anantnag Wildlife Division of South Circle depicted in table 5.5.

Table 5.5 Division having least survival percentage

S. No.	Species	Surviving (Nos.)	Survival %
1	*Malus domestica*	5622	6.65
2	*Prunus armeniaca*	4766	5.64

Closure having least survival percentage: Among the closure of 2012-13 to 2018-19, Rb-1a/ Padpawan established in 2012-13 of Shopian range of Shopian Division showed the least survival percentage of 1.18% and the same is produced in table 5.6.

Table 5.6 Closure having least survival percentage

S. No.	Species	Surviving (Nos.)	Survival %
1	*Cedrus deodara*	101	0.44
2	*Pinus wallichiana*	80	0.35
3	*Cupressus*	70	0.31
4	*Robinia pseudoacacia*	10	0.04
5	*Ulmus wallichiana*	10	0.04

Growth Parameters (Height and Girth)

The growth parameters were assessed by recording of average height and average girth. Among the plantations of 2012-13 to 2018-19, the average height and average girth of prominent species in different divisions is given in table 5.7.

Table 5.7 Division wise average height and girth of different species

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
01	Anantnag	*Cedrus deodara*	52	5	8	3

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
		Pinus wallichiana	55	4	7	4
		Robinia pseudoacacia	193	1	15.8	1
		Cupressus	70	3	6	5
		Malus domestica	152	2	8.33	2
		Average	**104.4**		**9.01**	
02	Anantnag (Social Forestry)	*Robinia pseudoacacia*	567.42	1	20.28	1
		Cedrus deodara	130.83	5	10.66	4
		Ulmus wallichiana	469.5	2	17.5	2
		Pinus wallichiana	151	4	10.4	5
		Malus domestica	337.5	3	15.75	3
		Average	**331.25**		**14.92**	
03	Anantnag (Soil & Water Conservation)	*Robinia pseudoacacia*	381	1	21.5	1
		Ulmus wallichiana	212.5	3	18.5	3
		Pinus wallichiana	212.5	3	14	5
		Cedrus deodara	240	2	19	2
		Cupressus	201	4	17	4
		Average	**249.4**		**18**	
04	Anantnag (wildlife)	*Malus domestica*	156.2	1	9.8	1
		Prunus armeniaca	141.2	2	8.4	2
		Average	**148.7**		**9.1**	
05	Awantipora	*Cedrus deodara*	49.6	4	8.33	3
		Prunus armeniaca	98.8	3	8.5	2
		Pinus wallichiana	38.8	5	6	4
		Robinia pseudoacacia	108.5	2	8.8	1
		Malus domestica	134.66	1	8.33	3
		Average	**86.07**		**7.99**	
06	Kulgam	*Pinus wallichiana*	59.83	5	8.16	5
		Cedrus deodara	66.16	4	8.33	4
		Robinia pseudoacacia	270.4	2	16.9	2
		Malus domestica	214.5	3	11	3

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
		Ulmus wallichiana	304	1	24.66	1
		Average	**182.98**		**13.81**	
07	Lidder	*Cedrus deodara*	150.28	5	18.85	5
		Robinia pseudoacacia	461.28	1	28	1
		Pinus wallichiana	167.28	4	23	3
		Ulmus wallichiana	413.57	2	26	2
		Fraxinus pennsylvanica	361.62	3	21.17	4
		Average	**310.81**		**23.40**	
08	Pulwama (Social Forestry)	*Pinus wallichiana*	69.77	5	4.21	5
		Cedrus deodara	73.26	4	5.5	4
		Robinia pseudoacacia	211.25	1	12.25	1
		Malus domestica	189	2	10.5	3
		Prunus armeniaca	183.25	3	11.25	2
		Average	**145.31**		**8.742**	
09	Shopian	*Robinia pseudoacacia*	180.28	1	12.57	2
		Cedrus deodara	51.71	4	6.71	4
		Pinus wallichiana	48.14	5	6.5	5
		Ulmus wallichiana	174.33	2	12.66	1
		Malus domestica	161.5	3	10.37	3
		Average	**123.19**		**9.76**	
10	Shopian (Soil & Water Conservation)	*Cedrus deodara*	75.25	3	4.75	4
		Pinus *wallichiana*	73.75	4	4.5	5
		Ulmus wallichiana	195.66	2	8.66	2
		Robinia pseudoacacia	248	1	9	1
		Aesculus indica	47	5	6	3
		Average	**127.93**		**6.58**	
11	Shopian (Wildlife)	*Malus domestica*	172.75	3	14.25	3
		Prunus armeniaca	158	4	13	4
		Prunus persica	280	2	24	2
		Rubus idaeus	155	5	9	5

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
		Cupressus	290	1	42	1
		Average	**211.15**		**20.45**	

Division having best growth parameters: Among the plantations of 2012-13 to 2018-19, based on the prominent species planted, Anantnag Social Forestry Division of South Circle showed the best performance in height and Lidder Division showed the best performance in girth and is presented in table 5.8.

Table 5.8 Division having best height and girth species wise

S. No.	Division	Species	Average height (cm)	Rank
01	Anantnag (Social Forestry)	*Robinia pseudoacacia*	567.42	1
02		*Cedrus deodara*	130.83	5
03		*Ulmus wallichiana*	469.5	2
04		*Pinus wallichiana*	151	4
05		*Malus domestica*	337.5	3
		Average	**331.25**	
S. No.	**Division**	**Species**	**Average girth (cm)**	**Rank**
01	Lidder	*Cedrus deodara*	18.85	5
02		*Robinia pseudoacacia*	28	1
03		*Pinus wallichiana*	23	3
04		*Ulmus wallichiana*	26	2
05		*Fraxinus pennsylvanica*	21.17	4
		Average	**23.40**	

Division having least growth: Among the plantations of 2012-13 to 2018-19, based on the prominent species planted, Awantipora division of South Circle recorded least growth in terms of height and Shopian (Soil & water conservation) division showed least growth in terms of girth and the details are given below in table 5.9.

Table 5.9 Division having least growth data species wise

S.No.	Division	Species	Average Height (cm)	Rank
01	Awantipora	*Cedrus deodara*	49.6	4
02		*Prunus armeniaca*	98.8	3
03		*Pinus wallichiana*	38.8	5
04		*Robinia pseudoacacia*	108.5	2
05		*Malus domestica*	134.66	1
		Average	86.07	
S.No.	**Division**	**Species**	**Average girth (cm)**	**Rank**
01	Shopian (Soil & Water Conservation)	*Cedrus deodara*	4.75	4
02		*Pinus wallichiana*	4.5	5
03		*Ulmus wallichiana*	8.66	2
04		*Robinia pseudoacacia*	9	1
05		*Aesculus indica*	6	3
		Average	**6.58**	

General observations South Circle (Division and closure wise): In South Circle a total of 64 closures were evaluated among the plantations of 2012-13 to 2018-19. In 64 closures 13,62,614 plants were planted of which 5,81,113 plants recorded surviving, belonging to 25 plant species including tree species, fruit trees, medicinal plants and ornamental plants which gave an overall average survival of 42.65% in South Circle. The maximum survival of 66.75% was recorded in Lidder division followed by 60.33% in Shopian Soil & Water Conservation division, Anantnag Social Forestry division 59.15% and minimum survival of 12.29% recorded in Anantnag Wildlife division. The closure wise details including survival percentage, fencing status, water harvesting structures in each site is given in table below.

Table 5.10 Closure wise performance (South Circle)

Division	Name of site	Year of plantation	Area	No. of plants planted	No. of surviving plants	Survival %	Fencing as per MB (rft)	Actual Fencing in field (rft)	% Variation Fencing	WHS as per MB (cum)	WHS in field
Anantnag	56/k-Hallen	2012-13	20	25000	1590	6.36	6000	6000	0	0	0
	08/V-Tunnel	2013-14	20	11750	3552	30.23	6000	6000	0	0	0
	70 b/k- Cherpora	2014-15	20	20500	6049	29.51	6000	6000	0	0	0
	64/k- Artinag	2015-16	18.41	19864	7708	38.80	6210	6210	0	0	0
	22/V-Halsidar	2016-17	17	18498	10674	57.70	5100	5100	0	0	0
	13b/V-Tunnel	2017-18	35	55250	11099	20.09	10500	10500	0	0	0

	13av (Ext.)	2018-19	38	58950	23297	39.52	11400	11400	0	0	0
	Overall		**168.41**	**209812**	**63969**	**30.49**	51210	51210	0	0	0
Annatnag Social Forestry	51 LDR	2012-13	15	15000	9080	60.53	4500	4500	0	0	0
	Co. 42 N	2013-14	20	12492	5101	40.83	6000	6000	0	0	0
	28/N	2014-15	10	9800	6176	63.02	3000	3000	0	0	0
	27N	2015-16	30	27900	18161	65.09	9000	9000	0	0	0
	59/V	2016-17	15	11950	6344	53.09	4500	4500	0	0	0
	RDF CO. 23/LDR	2017-18	20	22500	14451	64.23	6000	6000	0	0	0
	Co. 4 V	2018-19	16	12000	6718	55.98	4800	4800	0	0	0
	Overall		**126**	**111642**	**66031**	**59.15**	37800	37800	0	0	0
Anantnag Soil & water Conservation	108K	2013-14	7.6	7100	4244	59.77	2300	2300	0	103	103
	108K II	2014-15	16	18500	10272	55.52	5575	5575	0	307	307
	6-7 K	2015-16	22	27500	14524	52.81	6600	6600	0	0	0
	7 B	2017-18	13	5000	2550	51.00	3900	3900	0	256	256
	Overall		**58.6**	**58100**	**31590**	**54.37**	18375	18375	0	666	666
Anantnag wildlife	49 L	2012-13	20	15000	3430	22.87	6000	6000	0	0	0
	Pannar	2014-15	4.34	5000	2072	41.44	1350	1350	0	0	0
	47 L	2015-16	26.6	30000	2828	9.43	8000	8000	0	0	0
	Co. 1 & 7	2017-18	15	17264	1145	6.63	4500	4500	0	0	0
	7 RK	2018-19	15	17264	913	5.29	4500	4500	0	0	0
	overall		**80.94**	**84528**	**10388**	**12.29**	24350	24350	0	0	0
Awantipora	29/P Gulshanpora	2012-13	22	39350	19736	50.16	6600	6600	0	0	0
	25/N Naristan	2013-14	15	19650	8016	40.79	4500	4500	0	0	0
	28/P Seer	2016-17	38	57250	20003	34.94	11400	11400	0	0	0
	30/Lethpora	2017-18	25	35000	18311	52.32	7500	7500	0	0	0
	30/P Gulshanpora	2018-19	30	34600	16020	46.30	9000	9000	0	0	0
	Overall		**130**	**185850**	**82086**	**44.17**	39000	39000	0	0	0
Kulgam	V 31-32	2012-13	30	39700	12792	32.22	9000	9000	0	0	0
	48N	2013-14	35	46000	8723	18.96	10500	10500	0	0	0
	N44	2014-15	30	0	0	0.00	9000	9000	0	0	0
	23N	2015-16	25	22500	4223	18.77	7500	7500	0	0	0
	V 35 A	2016-17	20	16750	7489	44.71	6000	6000	0	0	0
	V 36	2017-18	10	3200	2220	69.38	3000	3000	0	0	0
	30/N Akhal	2018-19	30	39900	30212	75.72	9000	9000	0	0	0
	Overall		**180**	**168050**	**65659**	**39.07**	54000	54000	0	0	0
Lidder	18L	2012-13	21	36950	29871	80.84	6400	6400	0	0	0
	22 L	2013-14	15	18450	13982	75.78	4500	4500	0	0	0
	56 b/L	2014-15	26	34900	23183	66.43	7800	7800	0	0	0
	17L	2015-16	30	54500	32189	59.06	9000	9000	0	0	0
	31C/L	2016-17	20	36049	23681	65.69	6000	6000	0	0	0
	29L	2017-18	30	14320	9614	67.14	9000	9000	0	0	0
	9L	2018-19	20	25500	14770	57.92	6000	6000	0	0	0
	Overall		**162**	**220669**	**147290**	**66.75**	48700	48700	0	0	0
Pulwama Social Forestry	R1 07	2016-17	12	11855	7491	63.19	3600	3600	0	0	0
	RB 19	2017-18	20	16300	7771	47.67	6000	6000	0	0	0
	Co. 22/23	2017-18	20	16200	6024	37.19	6000	6000	0	0	0
	Rb 22	2017-18	20	16300	7678	47.10	6000	6000	0	0	0
	Co. RB 2	2017-18	15	12200	7774	63.72	4500	4500	0	0	0
	Strip plantation railway station Kakpora Pulwama	2018-19	0.75KM	250	207	82.80	250 Tree guard	250	0	0	0
	Strip plantation industrial estate Nowpora pulwama	2018-19	3KM	600	480	80.00	600 Tree guard	530	70 Tree guard	0	0
	Overall		**87/3.75Km**	**73705**	**37425**	**50.78**	26100/850 Tree guard	26100/780	70 Tree guard	0	0

Shopian	Rb-1a/ Padpawan	2012-13	22	22900	271	1.18	6600	6600	0	0	0
	Rb-33/Tharina	2013-14	20	14250	1504	10.55	6000	6000	0	0	0
	Rb-19/Methwani	2014-15	40	29500	4212	14.28	12000	12000	0	0	0
	V-4/Sedow	2015-16	44	28000	864	3.09	13200	13200	0	0	0
	Y-9/Batmuran (Exigency)	2016-17	15	18750	8460	45.12	4500	4500	0	0	0
	Rb-20/Nagbal Devpora	2017-18	20	20500	8216	40.08	6000	6000	0	0	0
	Y-1	2018-19	30	40605	15820	38.96	9000	9000	0	0	0
	Overall		**191**	**174505**	**39347**	**22.55**	57300	57300	0	0	0
Shopian Soil & water Conservation	V2A	2014-15	11	9700	5334	54.99	3300	3300	0	220	220
	V2b	2015-16	16	17100	10751	62.87	5000	5000	0	240	240
	V2A	2017-18	3.5	3000	1822	60.73	1000	1000	0	310	310
	V2b	2018-19	8	8553	5231	61.16	2400	2400	0	0	0
	Overall		**38.5**	**38353**	**23138**	**60.33**	11700	11700	0	770	770
Shopian wildlife	42K	2014-15	20	16500	10575	64.09	6000	6000	0	0	0
	43K	2015-16	8.85	15000	1215	8.10	2700	2700	0	0	0
	Rb-7 (i)	2017-18	4.5	3778	2320	61.41	1400	1400	0	0	0
	Rb-7(II)	2018-19	4.5	2122	80	3.77	1400	1400	0	0	0
	overall		**37.85**	**37400**	**14190**	**37.94**	11500	11500	0	0	0
	Overall South circle		1260.3/ 3.75Km	1362614	581113	42.65	380035	380035	70 Tree guard	1436	1436

Regeneration Status South Circle:

The regeneration survey was conducted inside five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site taken up for detailed survey. Natural regeneration has been observed in all 64 sample sites for the naturally occurring species like *Pinus wallichiana, Cedrus deodara, Robinia pseudoacacia, Ulmus wallichiana, Prunus armeniaca, Juglans regia & etc.* The observation on natural regeneration in the surveyed 64 sites of South Circle is presented in following table:

Table 5.11 Closure wise natural regeneration status in the sample plot (South Circle)

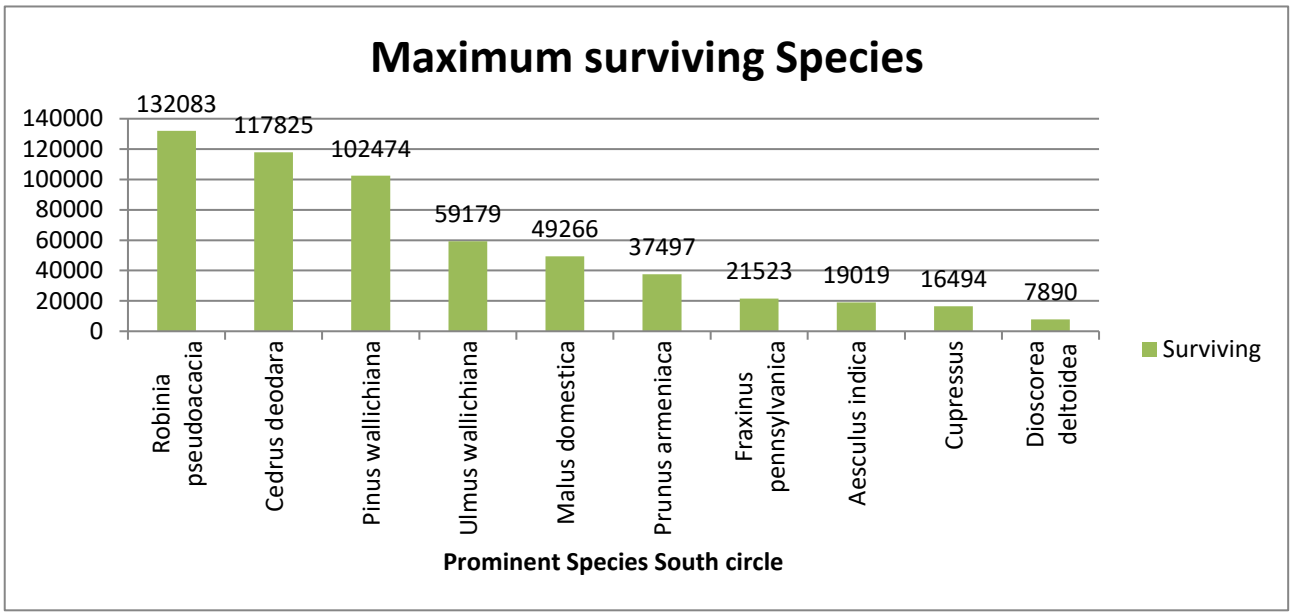
Division	Site	Year	Regeneration type	Species Name	Plants counted (Nos.)
Anantnag	56/k-Hallen	2012-13	NR	*Pinus wallichiana*	3
	08/V-Tunnel	2013-14	NR	*Robinia pseudoacacia*	15
			NR	*Pinus wallichiana*	4
	70 b/k-Cherpora	2014-15	NR	*Pinus wallichiana*	16
	64/k- Artinag	2015-16	NR	*Cedrus deodara*	4
			NR	*Robinia pseudoacacia*	21
	22/V-Halsidar	2016-17	NR	*Pinus wallichiana*	19
	13b/V-Tunnel	2017-18	NR	*Robinia pseudoacacia*	21
			NR	*Ulmus wallichiana*	12
	13av (Ext.)	2018-19	NR	*Pinus wallichiana*	9
Anantnag Social	51 LDR	2012-13	NR	*Cedrus deodara*	4

Forestry			NR	*Pinus wallichiana*	18
	Co. 42 N	2013-14	NR	*Robinia pseudoacacia*	21
			NR	*Pinus wallichiana*	8
	28/N	2014-15	NR	*Cedrus deodara*	5
			NR	*Robinia pseudoacacia*	17
	27N	2015-16	NR	*Cedrus deodara*	3
			NR	*Pinus wallichiana*	11
			NR	*Robinia pseudoacacia*	16
	59/V	2016-17	NR	*Cedrus deodara*	7
	RDF CO. 23/LDR	2017-18	NR	*Pinus wallichiana*	13
	Co. 4 V	2018-19	NR	*Pinus wallichiana*	13
			NR	*Robinia pseudoacacia*	4
Anantnag Soil & Water Conservation	108K	2013-14	NR	*Prunus armeniaca*	9
			NR	*Juglans regia*	2
	108K II	2014-15	NR	*Prunus armeniaca*	11
			NR	*Juglans regia*	3
	6-7 K	2015-16	NR	*Prunus armeniaca*	8
			NR	*Juglans regia*	4
	7 B	2017-18	NR	*Robinia pseudoacacia*	16
Anantnag wildlife	49 L	2012-13	NR	*Robinia pseudoacacia*	10
			NR	*Pinus wallichiana*	4
			NR	*Cedrus deodara*	3
	Pannar	2014-15	NR	*Pinus wallichiana*	9
	47 L	2015-16	NR	*Pinus wallichiana*	8
	Co. 1 & 7	2017-18	NR	*Pinus wallichiana*	9
	7 RK	2018-19	NR	*Pinus wallichiana*	11
Awantipora	29/P Gulshanpora	2012-13	NR	*Pinus wallichiana*	13
			NR	*Robinia pseudoacacia*	23
	25/N Naristan	2013-14	NR	*Robinia pseudoacacia*	21
			NR	*Ulmus wallichiana*	6
			NR	*Prunus armeniaca*	3
	28/P Seer	2016-17	NR	*Robinia pseudoacacia*	17
			NR	*Pinus wallichiana*	7
	30/Lethpora	2017-18	NR	Grasses	
	30/P Gulshanpora	2018-19	NR	*Robinia pseudoacacia*	15
			NR	*Pinus wallichiana*	5
Kulgam	V 31-32	2012-13	NR	*Pinus wallichiana*	12
			NR	*Juglans regia*	2
			NR	*Robinia pseudoacacia*	13
	48N	2013-14	NR	*Pinus wallichiana*	9
			NR	*Robinia pseudoacacia*	17
	N44	2014-15	NR	*Pinus wallichiana*	12

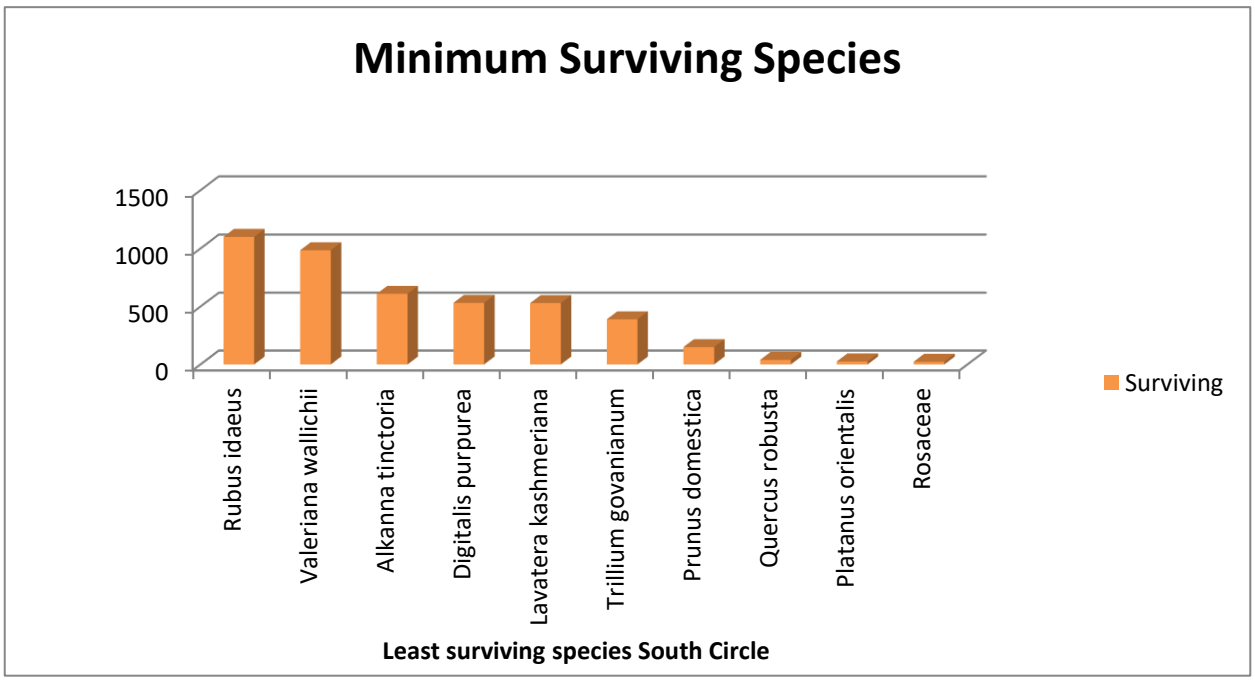
			NR	*Cedrus deodara*	6
	23N	2015-16	NR	*Cedrus deodara*	5
			NR	*Pinus wallichiana*	9
	V 35 A	2016-17	NR	*Pinus wallichiana*	9
			NR	*Abies pindrow*	4
	V 36	2017-18	NR	*Pinus wallichiana*	11
			NR	*Abies pindrow*	4
	30/N Akhal	2018-19	NR	*Pinus wallichiana*	9
			NR	*Cedrus deodara*	
Lidder	18L	2012-13	NR	*Cedrus deodara*	5
			NR	*Pinus wallichiana*	10
			NR	*Robinia pseudoacacia*	17
	22 L	2013-14	NR	*Cedrus deodara*	4
			NR	*Pinus wallichiana*	9
			NR	*Robinia pseudoacacia*	14
	56 b/L	2014-15	NR	*Pinus wallichiana*	12
			NR	*Robinia pseudoacacia*	21
	17L	2015-16	NR	*Robinia pseudoacacia*	16
			NR	*Pinus wallichiana*	11
	31C/L	2016-17	NR	*Pinus wallichiana*	9
			NR	*Cedrus deodara*	2
			NR	*Robinia pseudoacacia*	16
	29L	2017-18	NR	*Cedrus deodara*	3
			NR	*Pinus wallichiana*	9
			NR	*Robinia pseudoacacia*	14
	9L	2018-19	NR	*Pinus wallichiana*	12
			NR	*Robinia pseudoacacia*	17
Pulwama Social Forestry	R1 07	2016-17	NR	*Pinus wallichiana*	9
			NR	*Cedrus deodara*	3
	RB 19	2017-18	NR	*Pinus wallichiana*	7
			NR	*Cedrus deodara*	2
			NR	*Juglans regia*	2
	Co. 22/23	2017-18	NR	*Robinia pseudoacacia*	14
			NR	*Pinus wallichiana*	9
	Rb 22	2017-18	NR	*Pinus wallichiana*	11
			NR	*Cedrus deodara*	3
	Co. RB 2	2017-18	NR	*Pinus wallichiana*	12
			NR	*Cedrus deodara*	4
	Strip plantation railway station Kakpora Pulwama	2018-19	NR	Grasses	
	Strip plantation industrial estate	2018-19	NR	Grasses	

	Nowpora pulwama				
Shopian	Rb-1a/ Padpawan	2012-13	NR	*Pinus wallichiana*	5
			NR	*Cedrus deodara*	2
	Rb-33/Tharina	2013-14	NR	*Pinus wallichiana*	6
			NR	*Robinia pseudoacacia*	9
	Rb-19/Methwani	2014-15	NR	*Cedrus deodara*	7
	V-4/Sedow	2015-16	NR	*Cedrus deodara*	3
	Y-9/Batmuran (Exigency)	2016-17	NR	*Pinus wallichiana*	9
			NR	*Robinia pseudoacacia*	12
	Rb-20/Nagbal Devpora	2017-18	NR	*Cedrus deodara*	4
			NR	*Pinus wallichiana*	12
	Y-1	2018-19	NR	*Cedrus deodara*	3
			NR	*Pinus wallichiana*	10
Shopian Soil & water Conservation	V2A	2014-15	NR	*Cedrus deodara*	3
			NR	*Pinus wallichiana*	8
			NR	*Robinia pseudoacacia*	13
	V2b	2015-16	NR	*Cedrus deodara*	2
			NR	*Pinus wallichiana*	8
	V2A	2017-18	NR	*Robinia pseudoacacia*	10
			NR	*Juglans regia*	2
	V2b	2018-19	NR	*Pinus wallichiana*	13
			NR	*Cedrus deodara*	2
Shopian wildlife	42K	2014-15	NR	*Pinus wallichiana*	9
	43K	2015-16	NR	*Pinus wallichiana*	7
	Rb-7 (i)	2017-18	NR	*Pinus wallichiana*	8
			NR	*Cedrus deodara*	3
	Rb-7(II)	2018-19	NR	*Pinus wallichiana*	7
			NR	*Cedrus deodara*	2

Graphical representation of 10 prominent species surviving in different years (2012-13 to 2018-19) in different sites of South Circle under CAMPA plantation:



Graphical representation of least surviving species in different years (2012-13 to 2018-19) in different sites of South Circle under CAMPA plantation:



Fencing and water harvesting Structures:

Closures have mostly 4 strand barbed wire fencing with Angle iron poles, and in few closures it is chain link fencing. However, in Shopian Wild life Division 3 closures out of the 4 evaluated, the closures have barbed wire fencing with wooden poles and in Anantnag Wild life division the closures have also barbed wire fencing with wooden poles. In south circle, in few cases, fencing was of 4 strands + 2 crisscross. Distance between pole and poles vary from 8 feet to 10 feet. From the 64 evaluated sampled sites of South Circle, no variation in fencing was recorded in 63 sites. The variation was recorded only at 1 Plantation site of Social Forestry Pulwama (strip plantation at Industrial estate Nowpora 2018-19) where 70 Tree Guards were missing out of 600 Tree Guards. The water harvesting works was carried in 6 sites out of surveyed 64 sites. The water harvesting structures were DRSM works and crate wire bunds. No variation was recorded in water harvesting works. The water harvesting structures were found mostly serving the purpose. The details on fencing and water harvesting structures of South circle are given in table 5.10 above.

5.2 Kashmir North Circle

For the purpose of finding out the overall survival of different species in North Circle, a total of 06 divisions were considered. 34 sites of CAMPA established during the year 2012-13 to 2018-19 at 6 divisions were taken up for monitoring and evaluation. The best five important species which survived in different divisions is ranked and given in table 5.12.

Table 5.12 Species wise survival in different divisions

S.No.	Division	Species	Rank
01	JV	*Cedrus deodara*	1
		Robinia pseudoacacia	2
		Pinus wallichiana	3
		Ulmus wallichiana	4
		Prunus armeniaca	5
02	Kamraj	*Cedrus deodara*	1
		Robinia pseudoacacia	2
		Ulmus wallichiana	3

S.No.	Division	Species	Rank
		Aesculus indica	4
		Prunus armeniaca	5
03	Kehmil	*Cedrus deodara*	1
		Robinia pseudoacacia	2
		Pinus wallichiana	3
		Aesculus indica	4
		Ulmus wallichiana	5
04	Kupwara (Social Forestry)	*Robinia pseudoacacia*	1
		Cedrus deodara	2
		Aesculus indica	3
		Ulmus wallichiana	4
		Pinus wallichiana	5
05	Kupwara (Soil & Water Conservation)	*Robinia pseudoacacia*	1
		Ulmus wallichiana	2
		Cedrus deodara	3
		Malus domestica	4
		Prunus armeniaca	5
06	Langate	*Cedrus deodara*	1
		Robinia pseudoacacia	2
		Prunus armeniaca	3
		Ulmus wallichiana	4
		Pinus wallichiana	5

Further, if all the species of the plants planted in different divisions are clubbed together, then the species-wise survival ranking works out to be as depicted in table 5.13.

Table 5.13 Species wise survival ranking

S.No.	Species	Rank
1	*Aesculus indica*	4
2	*Cedrus deodara*	1
3	*Cupressus*	8
4	*Fraxinus pennsylvanica*	9
5	*Malus domestica*	7
6	*Pinus wallichiana*	5
7	*Populus deltoids*	11
8	*Prunus armeniaca*	6
9	Prunus avium	10
10	*Prunus domestica*	13
11	*Pyrus communis*	12
12	*Robinia pseudoacacia*	2
13	*Ulmus wallichiana*	3

Division with highest survival percentage: Among the plantations of 2012-13 to 2018-19 established under CAMPA, Kupwara Social Forestry division of North Circle has shown the highest survival percentage of 80.92%. The species wise surviving of the division is given in the table 5.14.

Table 5.14 Division having best survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1	*Robinia pseudoacacia*	62981	37.88
2	*Cedrus deodara*	33633	20.23

3	*Aesculus indica*	22792	13.71
4	*Ulmus wallichiana*	9412	5.66
5	*Pinus wallichiana*	3849	2.31
6	*Prunus armeniaca*	1483	0.89
7	*Malus domestica*	395	0.24

Closure with best survival percentage: The best survival percentage has been recorded in as 85.84 % in the closure 70 B Magam (2012-13) of Ramhal range of Kupwara Social Forestry division and the details are given in table 5.15.

Table 5.15 Closure having best survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1	*Robinia pseudoacacia*	11742	35.86
2	*Cedrus deodara*	4947	15.11
3	*Ulmus wallichiana*	3672	11.21
4	*Aesculus indica*	7746	23.66

Division having least survival percentage: Among the plantations of 2012-13 to 2018-19, the least survival percentage of 25.70% was recorded in Kamraj Division of North Circle details of which are as depicted in table 5.16.

Table 5.16 Division having least survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1.	*Cedrus deodara*	24045	12.01
2.	*Robinia pseudoacacia*	18398	9.19
3.	*Ulmus wallichiana*	4318	2.16
4.	*Aesculus indica*	3448	1.72

S.No.	Species	Surviving (Nos.)	Survival %
5.	*Prunus armeniaca*	1029	0.51
6.	*Malus domestica*	208	0.10

Closure having least survival percentage: Among the closure of 2012-13 to 2018-19, the closure 25/L Chandigam Gundmacher 2013-14 of South Lolab range of Kamraj division showed 2.93 % survival and the same is produced in table 5.17.

Table 5.17 Closure having least survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1.	*Cedrus deodara*	631	2.25
2	*Robinia pseudoacacia*	172	0.61
3	*Aesculus indica*	21	0.07

Growth Parameters (Height and Girth) North circle

The growth parameters were assessed by recording of average height and average girth. Among the plantations of 2012-13 to 2018-19, the average height and average girth of prominent species in different divisions is given in table 5.18.

Table 5.18 Average height and girth of different divisions

S.No.	Divisions	Species	Average height (cm)	Rank	Average girth (cm)	Rank
01	JV	*Cedrus deodara*	161.40	4	10.16	3
		Robinia pseudoacacia	285.71	1	15.24	1
		Pinus wallichiana	108.20	5	8.46	5
		Ulmus wallichiana	231.60	2	11.09	4
		Prunus armeniaca	197.90	3	12.06	2
		Average	**196.96**		**11.40**	
02	Kamraj	*Cedrus deodara*	120.83	4	9.58	3
		Robinia pseudoacacia	413.33	1	20.83	2
		Ulmus wallichiana	397.66	2	22.5	1

S.No.	Divisions	Species	Average height (cm)	Rank	Average girth (cm)	Rank
		Aesculus indica	88.8	5	5.2	5
		Prunus armeniaca	217.5	3	9.25	4
		Average	**247.62**		**13.47**	
03	Kehmil	*Cedrus deodara*	120.14	4	6.57	5
		Robinia pseudoacacia	387.86	1	21.71	1
		Pinus wallichiana	175	3	10	3
		Aesculus indica	89.2	5	7	4
		Ulmus wallichiana	346	2	17.33	2
		Average	**223.64**		**12.52**	
04	Kupwara (Social Forestry)	*Robinia pseudoacacia*	433.83	1	20.75	1
		Cedrus deodara	96.5	4	6.25	5
		Aesculus indica	166.66	3	11.92	3
		Ulmus wallichiana	304.33	2	16.75	2
		Pinus wallichiana	75.75	5	6.75	4
		Average	**215.41**		**12.48**	
05	Kupwara (Soil & water Conservation)	*Robinia pseudoacacia*	420	1	23.65	1
		Ulmus wallichiana	295	3	18.5	3
		Cedrus deodara	110	5	9.7	5
		Malus domestica	115	4	18.5	4
		Prunus armeniaca	310	2	21.5	2
		Average	**250**		**18.37**	
06	Langate	*Cedrus deodara*	120.85	4	8.82	4
		Robinia pseudoacacia	399.36	1	22.6	2
		Prunus armeniaca	175.17	3	18.5	3
		Ulmus wallichiana	275.25	2	22.75	1
		Pinus wallichiana	117.71	5	8.58	5
		Average	***217.67***		**16.25**	

Division having best growth parameters: Among the plantations of 2012-13 to 2018-19, based on the prominent species planted, Kupwara Soil & water Conservation division showed the best performance in height and girth and is presented in table 5.19.

Table 5.19 Division having best height and girth species wise

S.No	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
01	Kupwara Soil	*Robinia pseudoacacia*	420	1	23.65	1

02	& Water Conservation	*Ulmus wallichiana*	295	3	18.5	3
03		*Cedrus deodara*	110	5	9.7	5
04		*Malus domestica*	115	4	18.5	4
05		*Prunus armeniaca*	310	2	21.5	2
		Average	**250**		**18.37**	

Division having least growth data: Among the plantations of 2012-13 to 2018-19, based on the prominent species planted, JV division was appeared least in height and girth and the details are given in table 5.20.

Table 5.20 Division having least growth data species wise

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
01	JV	*Cedrus deodara*	161.40	4	10.16	3
02		*Robinia pseudoacacia*	285.71	1	15.24	1
03		*Pinus wallichiana*	108.20	5	8.46	5
04		*Ulmus wallichiana*	231.60	2	11.09	4
05		*Prunus armeniaca*	197.90	3	12.06	2
		Average	**196.96**		**11.40**	

General observations North circle (Division and Closure wise): In North Circle a total of 34 closures were evaluated among the plantations of 2012-13 to 2018-19. In 34 closures, 8,53,698 plants were planted of which 4,88,507 plants were recorded on ground belonging to 13 tree species including fruit trees which gave an overall average survival of 57.22% in North circle. The maximum survival of 80.92% was recorded in Kupwara Social Forestry division followed by 71.01% in Langate division, 70.05% in JV division and a minimum survival of 25.70% was recorded in Kamraj division. The closure wise details including survival percentage, fencing status, water harvesting structures in each site is given in table 5.21.

Table 5.21 Closure wise performance (North Circle)

Division	Name of site	Year of plantation	Area	No. of plants planted	No. of surviving plants	Survival %	Fencing as per MB (rft)	Actual Fencing in field (rft)	% Variation Fencing	WHS as per MB (cum)	WHS in field
JV	27/Bla	2012-13	20	20000	11710	58.55	6000	6000	0	0	0
	68 Kaitawal	2013-14	10	18915	13221	69.90	3000	2800	7	0	0
	68 Kaitawal	2014-15	24	12025	8209	68.27	7200	6580	9	0	0
	76/Bla	2016-17	17	21697	15987	73.68	5100	5100	0	0	0
	35 A	2018-19	18	25500	19621	76.95	5400	5400	0	0	0
	Overall		89	98137	68748	70.05	26700	25880	3.07	0	0
Kamraj	Muqam 33 Kandi	2012-13	30	45555	14309	31.41	9000	9000	0	140	0
	Gundimsncher 25/SL	2013-14	16	28100	824	2.93	4800	2880	40	110	0
	Khudi 91a/NL	2014-15	17	29650	2796	9.43	5100	4040	20	0	0
	Sulkote 125/NL	2015-16	25	39100	12907	33.01	7500	7500	0	0	0
	Sulkote125/NL	2016-17	20	27921	9717	34.80	6000	6000	0	0	0
	35/K (Ext)	2018-19	25	29830	10893	36.52	7500	7500	0	0	0
	Overall		**133**	**200156**	**51446**	**25.70**	39900	36920	7.47	250	0
Kehmil	74/NH	2012-13	20	21775	9603	44.10	6000	6000	0	0	0
	54/Nh/Trehgam	2013-14	20	20975	11513	54.89	6000	6000	0	0	0
	57/Nh/Gulgam 3	2014-15	20	22550	10022	44.44	6000	6000	0	0	0
	58/Nh/Gulgam	2015-16	27	32800	26518	80.85	8100	8100	0	0	0
	70b/NH/Punzwah	2016-17	22	29250	13807	47.20	6600	6600	0	0	0
	70b/Nh/Punzwah	2017-18	10	18750	2268	12.10	3000	3000	0	0	0
	30/NH/RH	2018-19	24	35624	18355	51.52	7200	7200	0	0	0
	Overall		**143**	**181724**	**92086**	**50.67**	42900	42900	0	0	0
Kupwara Social Forestry	70/B Magam	2012-13	20	32743	28107	85.84	5820	5820	0	0	0
	58/NH Tikker	2013-14	24	26540	21440	80.78	6650	6650	0	0	0
	85NL	2014-15	15	29355	21971	74.85	4500	4500	0	100	25
	50/SL	2015-16	15	27000	22319	82.66	4500	4500	0	0	0
	91/NL	2017-18	18	33180	26561	80.05	5400	5400	0	0	0
	57/NH Batergam	2018-19	10	17450	14147	81.07	3130	3130	0	0	0
	Overall		**102**	**166268**	**134545**	**80.92**	30000	30000	0	100	25
Kupwara Soil & Water Conservation	69R	2015-16	20	16584	6181	37.27	6000	6000	0	0	0
	27 R	2017-18	6	0	0	0.00	1700	1700	0	0	0
	Co. 5-6 Dobi Mohalla	2018-19	0	0	0	0.00	0	0	0	225	225
	Overall		**26**	**16584**	**6181**	**37.27**	7700	7700	0	225	225
Langate	70/ a Magam Pazalpora	2012-13	35	55917	33241	59.45	10500	10500	0	0	0
	51/ Magam Kukroosa	2013-14	16	13900	10429	75.03	4800	4800	0	0	0
	1a/Mawer Gundchoobtra	2014-15	18	17200	13216	76.84	5400	5400	0	0	0
	51 Magam, Zafarkhani	2015-16	10	12762	9807	76.85	3000	3000	0	0	0
	18/Rajwar, Behnipor	2016-17	15	21000	15744	74.97	4500	4500	0	0	0
	19 Mawer, shalthara	2017-18	20	28000	20823	74.37	6000	6000	0	0	0
	59 Rajwar	2018-19	27	42050	32241	76.67	8100	8100	0	0	0
	Overall		**141**	**190829**	**135501**	**71.01**	42300	42300	0	0	0
	Overall North Circle		634	853698	488507	57.22	189500	185700	2.01	575	250

Regeneration Status North Circle:

The regeneration survey was conducted inside five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site taken up for detailed survey. Natural regeneration has been observed in the sample sites for the naturally occurring species like *Cedrus deodara, Pinus wallichiana, Robinia pseudoacacia, Ulmus wallichiana, Abies Pindrow, Taxus baccata, Juglans regia etc. Th*e observation on natural regeneration in the surveyed 34 sites of North Circle is presented in table 5.22:

Table 5.22 Closure wise natural regeneration status in the sample plot (North circle)

Division	Site	Year	Regeneration type	Species Name	Plants counted (Nos.)
JV	27/Bla	2012-13	NR	*Abies Pindrow*	14
			NR	*Taxus baccata*	2
			NR	*Pinus wallichiana*	6
	68 Kaitawal	2013-14	NR	*Cedrus deodara*	12
			NR	*Pinus wallichiana*	9
	68 Kaitawal	2014-15	NR	*Cedrus deodara*	21
	76/Bla	2016-17	NR	*Cedrus deodara*	19
	35 A	2018-19	NR	*Cedrus deodara*	14
			NR	*Pinus wallichiana*	11
Kamraj	Muqam 33 Kandi	2012-13	NR	*Cedrus deodara*	6
			NR	*Robinia pseudoacacia*	14
			NR	*Ulmus wallichiana*	4
	Gundimsncher 25/SL	2013-14	NR	*Cedrus deodara*	11
			NR	*Abies Pindrow*	4
	Khudi 91a/NL	2014-15	NR	*Robinia pseudoacacia*	13
			NR	*Ulmus wallichiana*	5
			NR	*Aesculus indica*	7
	Sulkote 125/NL	2015-16	NR	*Robinia pseudoacacia*	16
			NR	*Juglans regia*	6
			NR	*Cedrus deodara*	6
	Sulkote125/NL	2016-17	NR	*Robinia pseudoacacia*	18
			NR	*Cedrus deodara*	7
	35/K (Ext)	2018-19	NR	*Robinia pseudoacacia*	17
			NR	*Abies Pindrow*	7
Kehmil	74/NH	2012-13	NR	*Cedrus deodara*	13
			NR	*Pinus wallichiana*	14
	54/Nh/Trehgam	2013-14	NR	*Pinus wallichiana*	12
			NR	*Cedrus deodara*	10
	57/Nh/Gulgam 3	2014-15	NR	*Pinus wallichiana*	15
	58/Nh/Gulgam	2015-16	NR	*Pinus wallichiana*	14
			NR	*Cedrus deodara*	15
	70b/NH/Punzwah	2016-17	NR	*Cedrus deodara*	13
			NR	*Pinus wallichiana*	14
	70b/Nh/Punzwah	2017-18	NR	*Cedrus deodara*	18
	30/NH/RH	2018-19	NR	*Robinia pseudoacacia*	14
			NR	*Pinus wallichiana*	9
			NR	*Cedrus deodara*	7
Kupwara social Forestry	70/B Magam	2012-13	NR	*Cedrus deodara*	17
	58/NH Tikker	2013-14	NR	*Pinus wallichiana*	18
	85NL	2014-15	NR	*Robinia pseudoacacia*	13

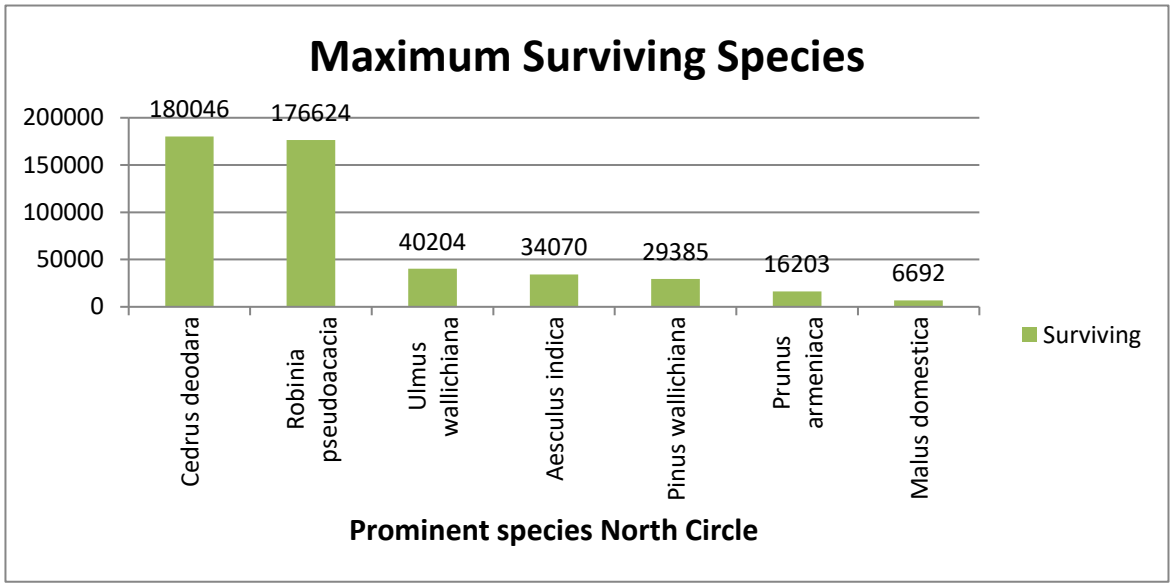
			NR	*Cedrus deodara*	9
	50/SL	2015-16	NR	*Pinus wallichiana*	12
			NR	*Cedrus deodara*	14
	91/NL	2017-18	NR	*Cedrus deodara*	13
			NR	*Pinus wallichiana*	11
	57/NH Batergam	2018-19	NR	*Robinia pseudoacacia*	14
			NR	*Ulmus wallichiana*	8
Kupwara Soil & Water Conservation	69R	2015-16	NR	*Cedrus deodara*	4
			NR	*Robinia pseudoacacia*	9
	27 R	2017-18	NR	*Grasses*	
	Co. 5-6 Dobi Mohalla	2018-19	NR	*Grassses*	
Langate	70/ a Magam Pazalpora	2012-13	NR	*Robinia pseudoacacia*	12
			NR	*Cedrus deodara*	7
			NR	*Pinus wallichiana*	5
	51/ Magam Kukroosa	2013-14	NR	*Robinia pseudoacacia*	13
			NR	*Cedrus deodara*	7
			NR	*Pinus wallichiana*	5
	1a/Mawer Gundchoobtra	2014-15	NR	*Robinia pseudoacacia*	9
			NR	*Cedrus deodara*	13
	51 Magam, Zafarkhani	2015-16	NR	*Robinia pseudoacacia*	9
			NR	*Cedrus deodara*	6
			NR	*Ulmus wallichiana*	7
	18/Rajwar, Behnipor	2016-17	NR	*Cedrus deodara*	6
			NR	*Robinia pseudoacacia*	7
			NR	*Ulmus wallichiana*	5
	19 Mawer, shalthara	2017-18	NR	*Robinia pseudoacacia*	19
			NR	*Cedrus deodara*	8
	59 Rajwar	2018-19	NR	*Cedrus deodara*	14
			NR	*Pinus wallichiana*	9

Fencing and water harvesting Structures:

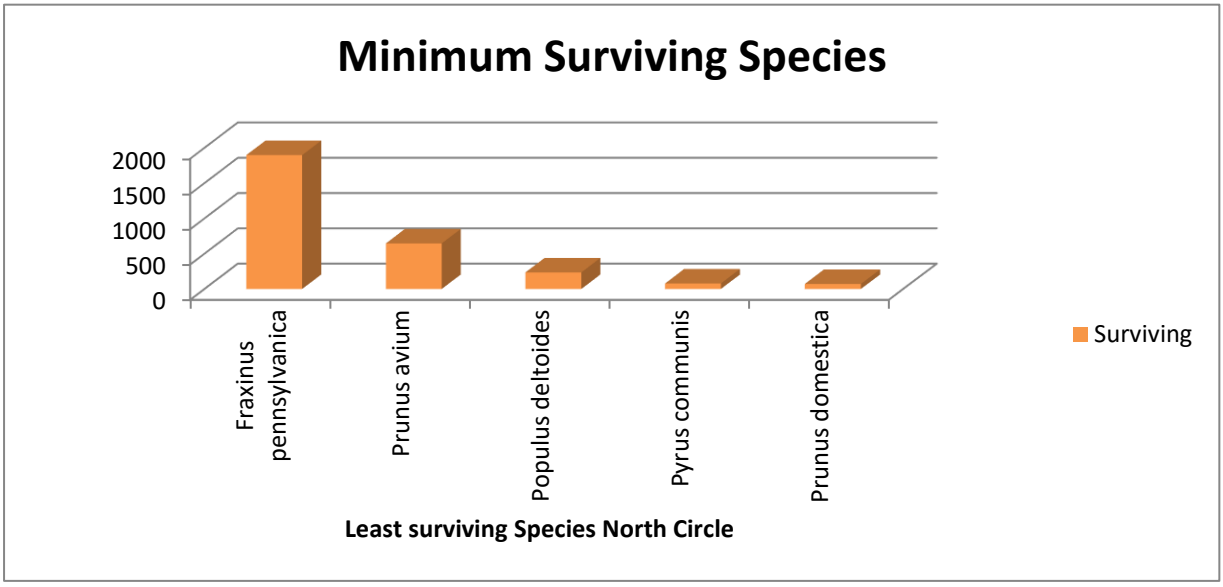
Closures have mostly 4 strand barbed wire fencing with Angle Iron poles, and in few closures it was chain link fencing. In some cases, fencing was of 4 strands + 2 crisscross. Distance between pole and poles vary from 8 feet to 10 feet. In the 34 sites of North Circle, the variation in fencing was recorded at Kamraj divisions 2 sites (closure Gundimsncher 25/SL 2013-14 & closure Khudi 91a/NL 2014-15) and in JV division 2 sites (closure 68

Kaitawal of 2013-14 & closure 68 Kaitawal of 2014-115. The overall variation in fencing in North circle was recorded 2.01%. The water harvesting structures variation (325 cum) was recorded in 2 sites of Kamraj division (250 cum) and 1 site of Kupwara social forestry division (75 cum). The details on fencing and water harvesting structures of North Circle are given in Table 5.21 above.

Graphical representation of 07 prominent species survived in different years (2012-13 to 2018-19) in different sites of North Circle under CAMPA plantation:



Graphical representation of least surviving species in different years (2012-13 to 2018-19) in different sites of North Circle under CAMPA plantation:



5.3 Srinagar Circle

For the purpose of finding out the overall survival of different species in Srinagar Circle, a total of 6 divisions were considered. 35 sites of CAMPA established during year 2012-13 to 2018-19 at 6 divisions were taken up for monitoring and evaluation. The best five important species which survived in different divisions is ranked and given in table 5.23.

Table 5.23 Species wise survival in different division

S.No.	Divisions	Species	Rank
01	Bandipora	*Robinia pseudoacacia*	1
		Cedrus deodara	2
		Ulmus wallichiana	3
		Prunus armeniaca	4
		Cupressus	5
02	Pir Panjal	*Cedrus deodara*	1
		Pinus wallichiana	2
		Robinia pseudoacacia	3
		Ulmus wallichiana	4
		Aesculus indica	5

S.No.	Divisions	Species	Rank
03	Sindh	*Cedrus deodara*	1
		Pinus wallichiana	2
		Robinia pseudoacacia	3
		Ulmus wallichiana	4
		Aesculus indica	5
04	Srinagar (Social Forestry)	*Robinia pseudoacacia*	1
		Ulmus wallichiana	2
		Pinus wallichiana	3
		Cedrus deodara	4
		Aesculus indica	5
05	Srinagar (Urban)	*Cedrus deodara*	1
		Pinus wallichiana	2
		Robinia pseudoacacia	3
		Aesculus indica	4
06	Tangmarg	*Cedrus deodara*	1
		Pinus wallichiana	2
		Robinia pseudoacacia	3
		Ulmus wallichiana	4
		Malus domestica	5

Further, if all the species of the plants planted in different divisions are clubbed together, then the species-wise survival ranking works out to be as presented in table 5.24.

Table 5.24 Species wise survival ranking

S.No.	Species	Rank
1	*Aesculus indica*	5
2	*Artemisia*	10
3	*Bergenia ciliate*	20
4	*Buddleja daviidii*	14

S.No.	Species	Rank
5	*Cedrus deodara*	1
6	*Cupressus*	8
7	*Dioscorea deltoidea*	17
8	*Forsythia*	13
9	*Fraxinus pennsylvanica*	9
10	*Malus domestica*	6
11	*Nerium*	16
12	*Pinus wallichiana*	3
13	*Prunus armeniaca*	7
14	*Pyrus communis*	11
15	*Queen Japani*	19
16	*Robinia pseudoacacia*	2
17	*Rosa rugosa*	18
18	*Spirea*	12
19	*Ulmus wallichiana*	4
20	*Vejaya*	15

Division with highest survival percentage: Pir Panjal division of Srinagar Circle had shown the highest survival percentage of 70.33% among the plantations of 2012-13 to 2018-19. The details are shown in table 5.25.

Table 5.25 Division having best survival percentage

S.No.	Species	Surviving (Nos.)	Survival%
1	*Cedrus deodara*	67202	35.79
2	*Pinus wallichiana*	30494	16.24
3	*Robinia pseudoacacia*	19617	10.45

4	*Ulmus wallichiana*	8934	4.76
5	*Aesculus indica*	5822	3.10

Closure with best survival percentage: The best survival percentage has been recorded in closure N-3 Chelyan (2018-19) of Soil Range of Pir Panjal division which is 76.96% details of which are given in table 5.26.

Table 5.26 Closure having best survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1	*Cedrus deodara*	5794	20.98
2	*Pinus wallichiana*	4881	20.76
3	*Robinia pseudoacacia*	2917	17.49
4	*Ulmus wallichiana*	2115	10.45
5	*Aesculus indica*	5774	7.58

Division having least survival percentage: Among the plantations of 2012-13 to 2018-19, the least survival percentage of 32.24% was recorded in Sindh division of Srinagar Circle details of which are presented in table 5.27.

Table 5.27 Division having least survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1.	*Cedrus deodara*	46122	17.70
2.	*Pinus wallichiana*	21522	8.26
3.	*Robinia pseudoacacia*	11757	4.51
4.	*Ulmus wallichiana*	3583	1.37
5.	*Aesculus indica*	787	0.30
6.	*Malus domestica*	212	0.08

7.	*Pyrus communis*	47	0.02

Closure having least survival percentage: Among the closure of 2012-13 to 2018-19, closure 4(a) of 2015-16 of Manasbal Range of Sindh division showed least survival percentage of 4.53% which is detailed in table 5.28.

Table 5.28 Closure having least survival percentage

S.No.	Species	Surviving (Nos.)	Survival %
1.	*Robinia pseudoacacia*	832	1.94
2	*Cedrus deodara*	729	1.70
3	*Pinus wallichiana*	381	0.89

Growth Parameters (height and girth) Srinagar Circle:

The growth parameters were assessed by recording of average height and average girth. Among the plantations of 2012-13 to 2018-19, the average height and average girth of prominent species in different divisions is given in table 5.29.

Table 5.29 Division wise average height and girth of different species

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
01	Bandipora	*Robinia pseudoacacia*	472.22	1	19.59	1
		Cedrus deodara	143	5	7.3	5
		Ulmus wallichiana	361.29	2	17.26	2
		Prunus armeniaca	212.22	3	11.88	3
		Cupressus	205.53	4	11.25	4
		Average	**278.85**		**13.46**	
02	PirPanjal	*Cedrus deodara*	155.06	3	10.57	4
		Pinus wallichiana	132.84	5	9.22	5

S.No.	Division	Species	Average height (cm)	Rank	Average girth (cm)	Rank
		Robinia pseudoacacia	311.62	1	23.33	1
		Ulmus wallichiana	222.95	2	14.72	2
		Aesculus indica	145	4	13.85	3
		Average	**193.49**		**14.34**	
03	Sindh	*Cedrus deodara*	108.05	5	7.48	4
		Pinus wallichiana	165.64	3	10.6	3
		Robinia pseudoacacia	227.57	1	10.99	2
		Ulmus wallichiana	213.36	2	14.35	1
		Aesculus indica	121.92	4	7.62	5
		Average	**167.31**		**10.21**	
04	Srinagar (Social Forestry)	*Robinia pseudoacacia*	336	1	15.25	1
		Ulmus wallichiana	277.5	2	13	2
		Pinus wallichiana	82	3	7.75	4
		Cedrus deodara	79	4	9.87	3
		Aesculus indica	20.5	5	2.75	5
		Average	**159**		**9.72**	
05	Srinagar (Urban)	*Cedrus deodara*	105.5	3	9	3
		Pinus wallichiana	167	2	15	1
		Robinia pseudoacacia	314	1	11	2
		Aesculus indica	21	4	3.5	4
		Average	**151.88**		**9.63**	
06	Tangmarg	*Cedrus deodara*	107.33	4	7.46	4
		Pinus wallichiana	82.14	5	7.1	5
		Robinia pseudoacacia	196	1	13.6	1
		Ulmus wallichiana	184	2	12.6	2
		Malus domestica	165	3	7.7	3
		Average	**146.89**		**9.69**	

Division having best growth parameters: Among the plantations of 2012-13 to 2018-19, based on the prominent species planted, Bandipora division showed the best performance in height, PirPanjal division showed the best performance in girth as presented in table 5.30.

Table 5.30 Division having best height and girth species wise

S. No.	Division	Species	Average height (cm)	Rank
01	Bandipora	*Robinia pseudoacacia*	472.22	1
02		*Cedrus deodara*	143	5
03		*Ulmus wallichiana*	361.29	2
04		*Prunus armeniaca*	212.22	3
05		*Cupressus*	205.53	4
		Average	**278.85**	
	Division	**Species**	**Average girth (cm)**	**Rank**
01	PirPanjal	*Cedrus deodara*	10.57	4
02		*Pinus wallichiana*	9.22	5
03		*Robinia pseudoacacia*	23.33	1
04		*Ulmus wallichiana*	14.72	2
05		*Aesculus indica*	13.85	3
		Average	**14.34**	

Division having least growth data: Among the plantations of 2012-13 to 2018-19, based on the prominent species planted, Tangmarg division recorded the least growth in terms of height, Srinagar (Urban) showed least growth in girth as shown in table 5.31.

Table 5.31 Division having least growth data species wise

S.No.	Division	Species	Average height (cm)	Rank
01	Tangmarg	*Cedrus deodara*	107.33	4
02		*Pinus wallichiana*	82.14	5
03		*Robinia pseudoacacia*	196	1

S.No.	Division	Species	Average height (cm)	Rank
04		*Ulmus wallichiana*	184	2
05		*Malus domestica*	165	3
		Average	**146.89**	
S.No.	**Division**	**Species**	**Average girth (cm)**	**Rank**
01	**Srinagar (Urban)**	*Cedrus deodara*	9	3
02		*Pinus wallichiana*	15	1
03		*Robinia pseudoacacia*	11	2
04		*Aesculus indica*	3.5	4
		Average	**9.63**	

General observations Srinagar Circle (Division and closure wise): In Srinagar Circle a total of 35 closures in 6 divisions was evaluated among the plantations of 2012-13 to 2018-19. In 35 closures 1052509 plants were planted of which 535661 plants were recorded on ground belonging to 20 tree species including fruit trees, medicinal and ornamental plants which gave an overall average survival of 50.89% in Srinagar Circle. The maximum survival of 70.33% was recorded in Pir Panjal division followed by Srinagar (Urban) 69.75%, Bandipora 58.40% and minimum survival of 32.24% was recorded in Sindh division. The closure wise details including survival percentage, fencing status, water harvesting structures in each site is given in table 5.32.

Table 5.32 Closure wise performance (Srinagar) Circle)

Division	Name of site	Year of plantation	Area	No. of plants planted	No. of surviving plants	Survival %	Fencing as per MB (rft)	Actual Fencing in field (rft)	% Variation Fencing	WHS as per MB (cum)	WHS in field
Bandipora	109/kh	2012-13	20	33000	24211	73.37	6000	6000	0	0	0
	144/kh mulkuihama	2013-14	20	41250	22142	53.68	7200	7200	0	0	0
	104/kh Bhuthoo	2014-15	35	54300	28617	52.70	10000	10000	0	0	0
	Watlab	2015-16	16	21400	14253	66.60	4800	4800	0	0	0
	Watlab	2016-17	16	25287	13790	54.53	4800	4800	0	0	0
	114/kh	2018-19	22	27200	15211	55.92	6600	6600	0	0	0
	Overall		**129**	**202437**	**118224**	**58.40**	39400	39400	0	0	0
PirPanjal	D-33 C	2012-13	21	43065	27076	62.87	6300	6300	0	0	0
	S-13	2013-14	20	28400	18204	64.10	6000	6000	0	0	0

	S-12	2014-15	15	23527	17504	74.40	4500	4500	0	0	0
	D-34 a	2015-16	15	26825	19661	73.29	4500	4500	0	0	0
	Co. N-1 A	2016-17	15	23751	17922	75.46	4500	4500	0	0	0
	Co. N-1 A Bacchanari	2017-18	10	14300	10221	71.48	3000	3000	0	0	0
	N-3 Chelyan	2018-19	11.5	27912	21481	76.96	3476	3476	0	0	0
	Overall		**107.5**	**187780**	**132069**	**70.33**	32276	32276	0	0	0
Sindh	03/Mbl	2012-13	25	42900	20604	48.03	7500	7500	0	180	0
	13/Sindh	2013-14	25	43473	21841	50.24	7500	7500	0	150	150
	47(b)/Mbl	2014-15	17	23000	11779	51.21	5100	5100	0	0	0
	4(a)Mbl	2015-16	26	42900	1942	4.53	7800	7800	0	180	60
	22/Sindh	2015-16	21	29705	15426	51.93	6300	6300	0	100	80
	23/Sindh	2016-17	20	39850	5698	14.30	6000	6000	0	0	0
	15/Mbl	2018-19	25	38800	6740	17.37	7500	7500	0	0	0
	Overall		**159**	**260628**	**84030**	**32.24**	47700	47700	0	610	290
Srinagar (Social Forestry)	7a/m	2012-13	16	23960	8079	33.72	3500	3500	0	100	0
	2/M	2013-14	26	44472	21096	47.44	7800	7800	0	0	0
	8/M	2014-15	25	28950	8815	30.45	7500	7500	0	0	0
	27/D	2015-16	20	28670	9575	33.40	6000	6000	0	0	0
	33/D	2017-18	13	12125	5428	44.77	3900	3900	0	0	0
	Manigam	2018-19	0	150	86	57.33	150	150	0	0	0
	Overall		100	138327	53079	38.37	28850	28850	0	100	0
Srinagar (Urban)	Basiwan	2014-15	20	12000	8345	69.54	6000	6000	0	0	0
	C. 12 Chasmashahi	2015-16	30	18000	12579	69.88	9000	9000	0	0	0
	Overall		**50**	**30000**	**20924**	**69.75**	15000	15000	0	0	0
Tangmarg	47/Gul	2012-13	8	12250	7105	58.00	2400	2400	0	0	0
	49-a/Gul	2013-14	25	41250	14998	36.36	7500	7500	0	0	0
	S-26	2014-15	25	41250	21148	51.27	7500	7500	0	0	0
	48/Gul	2015-16	35	49500	31213	63.06	10500	10500	0	0	0
	43/A/Gul	2016-17	34	54800	28416	51.85	10200	10200	0	0	0
	47-b-Gul	2017-18	2.1	1640	917	55.91	2560	2560	0	0	0
	29/Gul	2018-19	20	32647	23538	72.10	6000	6000	0	0	0
	Overall		**149.1**	**233337**	**127335**	**54.57**	46660	46660	0	0	0
	Overall Srinagar Circle		694.6	1052509	535661	50.89	209886	209886	0	710	290

Regeneration Status Srinagar Circle:

The regeneration survey was conducted inside five sample plots of 0.1 ha in the direction of east, west, north, south and centre of the closure site taken up for detailed survey. Natural regeneration has been observed in the sample sites for the naturally occurring species like *P Cedrus deodara, Pinus wallichiana, Robinia pseudoacacia, Abies Pindrow, Picea smithiana,*

*Taxus baccata, Ulmus wallichiana, Aesculus indica etc. Th*e observation on natural regeneration in the surveyed 35 sites of Srinagar Circle is presented in table 5.33.

Table 5.33 Closure wise natural regeneration status in the sample plot (Srinagar Circle)

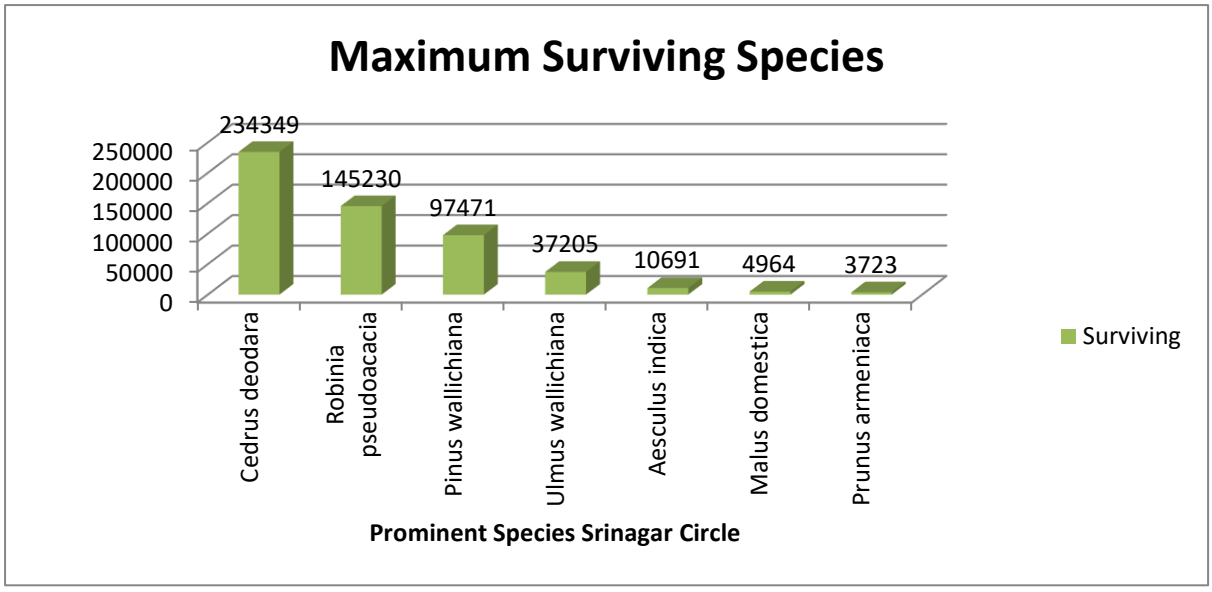
Division	Site	Year	Regeneration type	Species Name	Plants counted (Nos.)
Bandipora	109/kh	2012-13	NR	*Cupressus*	6
			NR	*Pinus wallichiana*	16
			NR	*Cedrus deodara*	7
	144/kh mulkuihama	2013-14	NR	*Pinus wallichiana*	14
			NR	*Ulmus wallichiana*	9
	104/kh Bhuthoo	2014-15	NR	*Cedrus deodara*	13
			NR	*Ulmus wallichiana*	9
			NR	*Malus domestica*	3
	Watlab	2015-16	NR	*Robinia pseudoacacia*	9
			NR	*Ulmus wallichiana*	8
	Watlab	2016-17	NR	*Robinia pseudoacacia*	13
			NR	*Ulmus wallichiana*	7
	114/kh	2018-19	NR	*Cedrus deodara*	13
PirPanjal	D-33 C	2012-13	NR	*Pinus wallichiana*	15
			NR	*Abies Pindrow*	16
	S-13	2013-14	NR	*Pinus wallichiana*	9
			NR	*Abies Pindrow*	11
			NR	*Cedrus deodara*	4
	S-12	2014-15	NR	*Pinus wallichiana*	8
			NR	*Abies Pindrow*	12
	D-34 a	2015-16	NR	*Pinus wallichiana*	7
			NR	*Abies Pindrow*	12
	Co. N-1 A	2016-17	NR	*Pinus wallichiana*	12
			NR	*Abies Pindrow*	15
	Co. N-1 A Bacchanari	2017-18	NR	*Robinia pseudoacacia*	17
			NR	*Ailanthus*	14
	N-3 Chelyan	2018-19	NR	*Pinus wallichiana*	12
			NR	*Abies Pindrow*	13
			NR	*Cedrus deodara*	5
Sindh	03/Mbl	2012-13	NR	*Cedrus deodara*	9
			NR	*Pinus wallichiana*	12
	13/Sindh	2013-14	NR	*Pinus wallichiana*	17
			NR	*Cedrus deodara*	11
	47(b)/Mbl	2014-15	NR	*Cedrus deodara*	19
			NR	*Juniperus*	2
			NR	*Pinus wallichiana*	10

	4(a)Mbl	2015-16	NR	*Pinus wallichiana*	7
			NR	*Cedrus deodara*	6
	22/Sindh	2015-16	NR	*Cedrus deodara*	12
			NR	*Pinus wallichiana*	8
	23/Sindh	2016-17	NR	*Pinus wallichiana*	13
			NR	*Cedrus deodara*	7
	15/Mbl	2018-19	NR	*Pinus wallichiana*	13
Srinagar (Social Forestry)	7a/m	2012-13	NR	*Robinia pseudoacacia*	13
	2/M	2013-14	NR	*Pinus wallichiana*	11
			NR	*Robinia pseudoacacia*	9
	8/M	2014-15	NR	*Robinia pseudoacacia*	13
	27/D	2015-16	NR	*Pinus wallichiana*	12
			NR	*Robinia pseudoacacia*	10
	33/D	2017-18	NR	*Pinus wallichiana*	14
	Manigam	2018-19	NR	*Nil*	
Srinagar (Urban)	Basiwan	2014-15	NR	*Pinus wallichiana*	14
	C. 12 Chasmashahi	2015-16	NR	*Pinus wallichiana*	16
Tangmarg	47/Gul	2012-13	NR	*Pinus wallichiana*	14
			NR	*Picea smithiana*	5
			NR	*Abies Pindrow*	9
	49-a/Gul	2013-14	NR	*Pinus wallichiana*	12
			NR	*Abies Pindrow*	8
	S-26	2014-15	NR	*Robinia pseudoacacia*	6
			NR	*Abies Pindrow*	2
	48/Gul	2015-16	NR	*Cedrus deodara*	9
			NR	*Pinus wallichiana*	11
			NR	*Abies Pindrow*	6
	43/A/Gul	2016-17	NR	*Pinus wallichiana*	6
			NR	*Abies Pindrow*	4
			NR	*Picea smithiana*	3
			NR	*Cedrus deodara*	5
			NR	*Taxus baccata*	3
	47-b-Gul	2017-18	NR	*Robinia pseudoacacia*	13
			NR	*Aesculus indica*	11
			NR	*Pinus wallichiana*	6
			NR	*Abies Pindrow*	3
			NR	*Taxus baccata*	2
	29/Gul	2018-19	NR	*Pinus wallichiana*	11
			NR	*Cedrus deodara*	14
			NR	*Picea smithiana*	3
			NR	*Abies Pindrow*	5
			NR	*Aesculus indica*	4

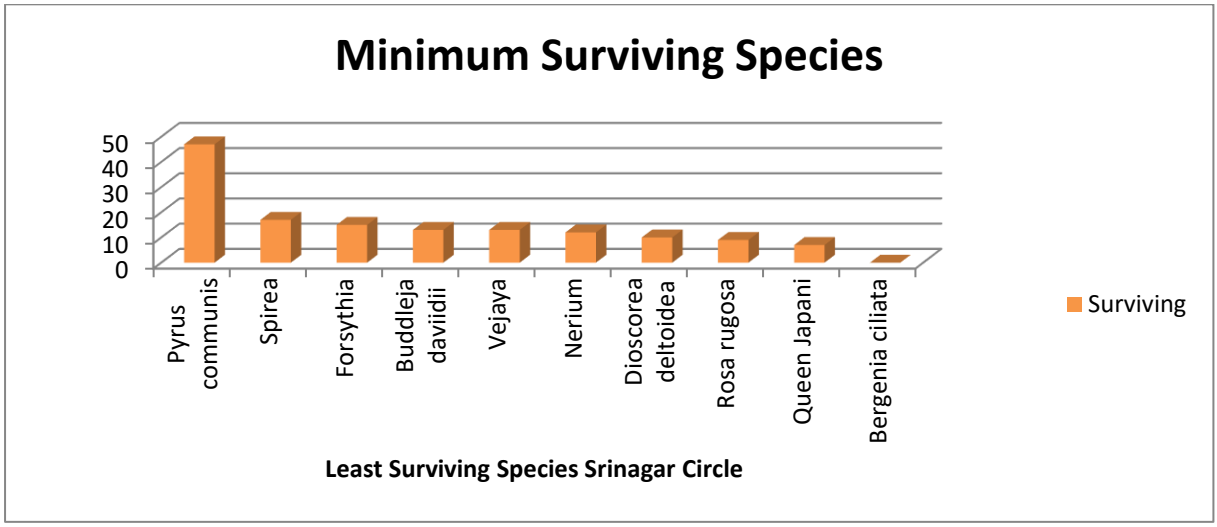
Fencing and water harvesting Structures:

Closures have mostly 4 strand barbed wire fencing with Angle iron poles, and in few closures it is chain link fencing. In Srinagar circle, in few cases, fencing was of 4 strands + 2 crisscross. Distance between pole and poles vary from 8 feet to 10 feet. No variation in fencing recorded from the 35 evaluated sampled sites of Srinagar Circle. The water harvesting works like DRSM, Crate wire (710 cum) was carried in 5 sites out of surveyed 35 sites. The variation in water harvesting work was recorded in 3 sites in Sindh division (320 cum) and in Social Forestry Srinagar division in 1 site (100 cum). The details on fencing and water harvesting structures of Srinagar circle are given in table 5.43 above.

<u>Graphical representation of 7 prominent species surviving in different years (2012-13 to 2018-19) in different sites of Srinagar Circle under CAMPA plantation:</u>



Graphical representation of least surviving species in different years (2012-13 to 2018-19) in different sites of Srinagar Circle under CAMPA plantation:



5.4 Community Perception (through FGD)

Views of the local community were collected, through Focused Group Discussion from the inhabitants of the closure sites and their views were solicited on various aspects like CAMPA project, rapport with forest department, incidence of forest fire in the area, public demands, usufruct right and benefit sharing mechanism etc. During FGD in the evaluation area it was observed that around 78% inhabitants of the CAMPA closure sites are aware of CAMPA project. However, the community was not involved in planning and implementation of the project barring a few persons who were involved at the time of fencing and plantation of closures. It was found that the contractors used their own labors for fencing of closures. The inhabitants of the closure sites are mostly dependent on livestock so on usufruct right and benefit sharing the response of the community was found satisfactory. They are getting fodder for livestock from the closure sites. During FGD it was recorded that, in case of fire incident in the forest area, people are helping forest officials for dousing the fire, which is a good sign. People are demanding that they should be engaged by the department for any work that is to be done in the forest area. They are also demanding that watch and ward should be provided to the closure sites.

5.5 Year-wise Survival & Natural Regeneration Kashmir Region

The overall picture of the survival and natural regeneration Division-wise and Year-wise is presented in table 5.34.

Table 5.34 Division wise and year wise survival & natural regeneration for Kashmir Region

Circle	Division	2012-13		2013-14		2014-15		2015-16		2016-17		2017-18		2018-19		Survival % Division wise	NR (Per ha)
		Survival %	NR (per ha)	Survival %	NR (per ha)	Survival %	NR (per ha)	Survival %	NR (per ha)	Survival %	NR (per ha)	Survival %	NR (per ha)	Survival %	NR (per ha)		
	Anantnag	6.36	60	30.23	380	29.51	320	38.8	500	57.7	380	20.09	640	39.52	180	30.49	351
	Anantnag Social Forestry	60.53	440	40.83	580	63.02	440	65.09	600	53.09	140	64.23	260	55.98	340	59.15	400
	Anantnag Soil & water Conservation			59.77	220	55.52	280	52.81	240			51	320			54.37	265
South	Anantnag Wildlife	22.87	340			41.44	180	9.43	160			6.63	180	5.29	220	12.29	270
	Awantipora	50.16	720	40.79	600					39.94	480	52.32	0	46.3	400	44.17	440
	Kulgam	32.22	540	18.96	520		360	18.77	280	44.71	260	69.38	300	75.72	280	39.07	363
	Lidder	80.84	640	75.78	540	66.43	660	59.06	540	65.69	540	67.14	520	57.92	580	66.75	574
	Pulwama social Forestry									63.19	240	48.92	320	81.4		50.78	280
	Shopian	1.18	140	10.55	300	14.28	140	3.09	60	45.12	420	40.08	320	38.96	260	22.55	234
	Shopian Soil & water conservation					54.99	480	62.87	200			60.73	240	61.16	300	60.33	305
	Shopian wildlife					64.09	180	8.10	140			61.41	220	3.77	180	37.94	180
	Overall South circle	**36.31**	**411**	**39.56**	**448**	**48.66**	**338**	**35.33**	**302.00**	**52.78**	**351**	**49.27**	**301**	**46.6**	**304**		351
North	JV	58.55	440	69.9	420	68.27	420			73.68	380			76.95	500	70.05	432
	Kamraj	31.41	500	2.93	480	9.43	300	33.01	500	34.8	560			36.52	480	25.7	470
	Kehmil	44.1	540	54.89	440	44.44	300	80.85	580	47.2	540	12.1	360	51.52	600	50.67	480
	Kupwara Social Forestry	85.84	340	80.78	360	74.85	440	82.66	520			80.05	480	81.07	440	80.92	430
	Kupwara SWC							37.27	260							37.27	260

	Langate	59.45	480	75.03	500	76.84	440	76.85	440	74.97	360	74.37	540	76.67	460	71.01	460
	Overall North circle	**55.87**	**460**	**56.71**	**440**	**54.77**	**380**	**62.13**	**460**	**57.66**	**460**	**55.51**	**460**	**64.55**	**496**		451
Srinagar	Bandipora	73.37	580	53.68	460	52.7	500	66.60	340	54.53	400			55.92	260	58.40	423
	Pir Panjal	62.87	620	64.1	480	74.4	400	73.29	380	75.46	540	71.48	620	76.96	600	70.33	520
	Sindh	48.03	420	50.24	560	51.21	420	28.23	330	14.30	400			17.37	260	32.24	398
	Srinagar Social Forestry	33.72	260	47.44	400	30.45	260	33.40	440			44.77	280	57.33		38.37	273
	Srinagar Urban					69.54	280	69.88	320							69.75	300
	Tangmarg	58	560	36.36	400	51.27	160	63.06	520	51.85	420	55.91	700	72.10	740	54.57	500
	Overall Srinagar Circle	**55.2**	**488**	**50.36**	**460**	**54.93**	**336**	**55.74**	**388**	**49.04**	**440**	**57.38**	**533**	**55.94**	**465**	**53.94**	**444**

The overall picture of the survival and natural regeneration Year-wise and Circle-wise based on the sample sites is presented in table 5.35. Individual Circles have also been rated yearwise based on the total number of plants i.e. survived and natural regeneration.

Table 5.35 Year wise circle wise survival & natural regeneration for Kashmir Region

Year	Circle	No. of Closures	Area (ha)	No. of plants planted	No. of surviving plants	Survival %	No. of plants survived per ha	NR (per ha)	Total No. of Plants (Survived + NR) per ha	Result* (Very Good/ Good/Satisfactory / Deficient)
2012-13	South Circle	7	150	193900	76770	39.59	512	411	923	Good
	North Circle	5	125	175990	96970	55.10	776	456	1232	Very Good
	Srinagar Circle	5	90	155175	87075	56.11	968	488	1456	Very Good
	Kashmir Region	17	365	525065	260815	49.67	715	451	1166	Very Good
2013-14	South Circle	7	132.6	129692	45122	34.79	340	449	789	Good
	North Circle	5	86	108430	57427	52.96	668	404	1072	Very Good
	Srinagar Circle	5	116	198845	98281	49.43	847	460	1307	Very Good
	Kashmir Region	17	334.6	436967	200830	45.96	600	437	1037	Very Good
2014-15	South Circle	9	177.34	144400	67873	47.00	383	338	721	Satisfactory
	North Circle	5	94	110780	56214	50.74	598	420	1018	Very Good
	Srinagar Circle	6	137	183027	96208	52.56	702	370	1072	Very Good
	Kashmir Region	20	408.34	438207	220295	50.27	539	376	915	Good
2015-16	South Circle	9	220.86	242364	92463	38.15	419	302	721	Satisfactory
	North Circle	5	97	128246	77732	60.61	801	472	1273	Very Good
	Srinagar Circle	7	163	217000	104649	48.23	642	380	1022	Very Good
	Kashmir Region	21	480.86	587610	274844	46.77	572	384	956	Good
2016-17	South Circle	7	137	171102	84142	49.18	614	351	965	Good
	North Circle	4	74	99868	55255	55.33	747	445	1192	Very Good
	Srinagar Circle	4	85	143688	65826	45.81	774	440	1214	Very Good

	Kashmir Region	15	296	414658	205223	49.49	693	412	1105	Very Good
2017-18	South Circle	14	251	240812	100995	41.94	402	306	708	Satisfactory
	North Circle	4	54	79930	49652	62.12	919	345	1264	Very Good
	Srinagar Circle	3	25.1	28065	16566	59.03	660	533	1193	Very Good
	Kashmir Region	21	330.1	348807	167213	47.94	507	394	901	Good
2018-19	South Circle	11	191.5	240344	113748	47.33	594	249	843	Good
	North Circle	6	104	150454	95257	63.31	916	413	1329	Very Good
	Srinagar Circle	5	78.5	126709	67056	52.92	854	372	1226	Very Good
	Kashmir Region	22	374	517507	276061	53.34	738	344	1082	Very Good
	South Circle	64	1260.3	1362614	581113	42.65	461	344	805	Good
	North Circle	34	634	853698	488507	57.22	771	422	1193	Very Good
	Srinagar Circle	35	694.6	1052509	535661	50.89	771	435	1206	Very Good
	Kashmir Region	133	2588.9	3268821	1605281	49.11	620	400	1020	Very Good

* 1001 and above plants per ha	Very Good
751 - 1000 plants per ha	Good
501-750 plants per ha	Satisfactory
≤ 500 plants per ha	Deficient

Based on the criteria of total density of plants (survived and natural regeneration), yearwise rating has been done of individual Circles in Kashmir region and presented in the above table.

5.6 Other Assests procured/created under CAMPA

The assets procured/created under CAMPA (2012-13 to 2018-19) in various divisions of Kashmir region were GPS instruments, computers/laptops, printers, inverters, cameras, UPS, generator and vehicle, etc. Under civil works, bathrooms, BO huts, office buildings, guest houses, etc., were constructed. In the Kashmir region under CAMPA during 2012-13 to 2018-19, 47 GPS instruments, 3 Photostat machines, 55 computers, 17 printers, 1 Generator, 2 inverters, 10 UPS, 1 LED, 5 Vehicles and 232 miscelleanous items for office uses were purchased. The equipments were verified in the various divisions by NHC team and all were found mostly functional and are serving the intended purpose. The civil works verified were also found mostly in good condition.

Table 5.36: Details of assets, civil works of CAMPA purchased/verified by NHC Team in Kashmir Region (2012-13 to 2018-19)

S. No.	Division	GPS	Photostat machine	Computer/Laptop	Printer	Generator	Inverter	UPS	LED	Vehicle	Miscelleanous items for office use	Equipments verified by NH Consultancy team
1	Anantnag	0		4	3		1	2		1	2	Equipments verified by the team were mostly found serving the intended purpose
2	Anantnag Social Forestry	1	0	0	0	0	0	0	0	0	39	
3	Anantnag Soil & water Conservation	0	0	0	0	0	0	0	0	0	0	
4	Anantnag Wildlife	0	0	0	0	0	0	0	0	0	0	
5	Awantipora	3	0	2	1	0	0	1	0	0	14	
6	Kulgam	5	0	0	0	0	0	0	0	0	3	
7	Lidder	6	1	5	3	0	0	0	0	0	0	
8	Pulwama social Forestry	0	0	0	0	0	1	0	0	0	0	
9	Shopian	0	0	2	0	0	0	1	0	0	16	
10	Shopian Soil & water conservation	0	0	0	0	0	0	0	0	0	0	
11	Shopian wildlife	0	0	0	0	0	0	0	0	0	0	
12	JV	4	1	4	3	0	0	2	0	0	14	
13	Kamraj	4	0	3	1	0	0	0	0	1	29	
14	Kehmil	0	1	4	0	0	0	0	0	1	0	
15	Kupwara Social Forestry	0	0	3	2	0	0	0	0	0	0	
16	Kupwara SWC	0	0	0	0	0	0	0	0	0	0	
17	Langate	0	0	3	1	1	0	0	1	0	27	
18	Bandipora	0	0	2	0	0	0	0	0	0	0	
19	Pir Panjal	0	0	3	3	0	0	2	0	1	7	
20	Sindh	24	0	11	0	0	0	0	0	0	0	

21	Srinagar Social Forestry	0	0	6	0	0	0	0	0	1	79	
22	Srinagar Urban	0	0	0	0	0	0	0	0	0	0	
23	Tangmarg	0	0	3	0	0	0	2	0	0	2	
	Total	47	3	55	17	1	2	10	1	5	232	

5.7 Output and Outcome

Output: The plantation made during 2012-13 to 2018-19 has shown a survival rate of 49.11% which can be considered as good in tough terrains. The primary output can be said to be success in terms of afforestation. The degraded forest lands and the barren hills have been rehabilitated through gap fillings resulting in increased density of plants. The man-days required right from advance work to plantation and maintenance has been catered through deployment of local community and hence employment has been generated to them. The soil moisture conservation work is instrumental in checking soil moisture runoff which in many places have resulted in improved vegetation and productivity in the impacted catchment area. Increased grass for cattle grazing is another output which is basic occupational need of the catchment area. Awareness on environment and climate change resilience has also increased through training and capacity building. The joint forest management network has increased through their capacity building.

Outcome: The interventions have been found to be sustainable in the long run. The areas treated will be producing substantial quantity of bio mass for community use in terms of fodder and fuelwood. The improved soil moisture regime will be recharging the ground water level to be supportive to the vegetation and natural growth of flora in the area. The growth of shrubs, medicinal plants and herbs will be supporting to the livelihood security in the area. The crown and ground density of the forests will keep on increasing through growth and regeneration of the plants planted. The well-stocked forests in the future will be checking floods and soil moisture run off. The expanded forests will be attracting more rain and hence agricultural and horticultural prosperity in the catchment area.

Chapter VI: Suggestions and Recommedations

Based on the comprehensive surveys, enumerations and field observations the consultants are submitting a set of suggestions as follows:

1. The Forest Department may strengthen the network of Village Forest Management Committees (VFMCs) in the plantation sites so that they get the benefits of usufruct sharing in due course of time and also protect the plantation areas. This will encourage local people for protection of plantations on principle of "Care and Share".
2. Success of any plantation is dependent on the nursery stock. It was found that some of the divisions are getting planting stock from other divisions or from central nurseries. The divisions should prefer to develop their own nursery stock close to plantation sites which may give better survival percent. In future plantations nurseries can be improved to produce quality saplings to minimise damage in transportation.
3. Success of plantation site is also dependent on the adaptability of species. Species - site matching to be assured and correct choice of species may avoid poor survival.
4. The data of plantations sites in most of the divisions is not up to the mark. It was observed during evaluation that closure journal of the sites is not maintained properly, as required. In the closure journals they have mentioned only name of species and total number, but not species wise numbers planted. This is required to assess and monitor the actual survival % of the species. It is suggested that plantation/closure journals should be well maintained and updated periodically.
5. During field evaluation it was found that the casual labours engaged under CAMPA for protection of closure are not getting salary in time. This has led to lack of motivation for protection of plantations and adversely effected some closures. This is one of the main reasons for poor growth and survival in some closures.

6. Grazing pressure is very high in Kashmir region particularly during summer season due to the migration of Livestock by Jammu Bakarwals. Watch and ward which is very important for success of closure, has been provided for most of the plantation sites but there are incidences of damaging the fencing for grazing. The major demands of local communities were for watch and ward of the closure where it was absent. The department may also plan for establishing fodder banks to reduce the pressure of grazing.
7. Forest fire is a major threat to success of closure. Department may conduct workshops for field functionaries and other stakeholders to train them in fire fighting and protection measures. Mock exercises may also be conducted. The department should also pamphlets for Do's and Don'ts in the forest area, in local language and get it distributed among the inhabitants particularly residing in the forest fringe areas.
8. Fencing of plantation site also improves the chances of plantation survival. The field functionaries should monitor fencing of the closure site. Whenever reported, worn out of fencing may be corrected immediately by engaging staffs. This will be helpful not only in protecting ANR plantation but also natural regeneration of the area from grazing.
9. Capacity building is one of the main components that need to be focused by the department. The field functionaries may be well trained on aspects like selection of sites, choice of species to be planted, nursery development, seed selection, seed processing, record keeping and maintaining closure journal. Awareness camps may also be organised, particularly for the inhabitants of the closure sites, to make them aware of the benefits of plantation. Training and capacity building of community in plantation and allied activities will help both in afforestation as well as conservation.
10. The Divisional Forest Officer may also engage staffs for effective internal monitoring of the plantation sites, for at least first two years who will submit quarterly report on plantation sites. This practice will also enhance plantation survival. The DFOs/ Conservators and other higher officials should periodically inspect the sites and write their inspection note and the follow up against these inspection notes should be monitored by the concerned DFOs.

11. J&K Forest Department may fix and organise a CAMPA day/week. On this occasion, the associated persons whether departmental/public who have done good work may be recognised, appreciated and awarded which will encourage others to participate and perform better.
12. The success story of CAMPA plantation should be identified at Division level every year. They should be documented and made available in public domain.
13. The plantation drives undertaken by the Social Forestry Division should be streamlined, reoriented and focused for rehabilitation and restoration of degraded forest patches instead of haphazard scattered plantations at school, roadsides in the name of plantation drives. All the stakeholders/voluntaries, schools, colleges NGO's or any other interested party must be encouraged for adaption of any degraded forest patch of their area for plantation.

Photographs

Closure 50 /SL (2015-16) Social Forestry Kupwara

Closure 70B/ Magam (2012-13) Social Forestry Kupwara

Closure 58 NH/ Gulgam (2015-16) Kehmil division

Closure 70 B/NH Punzwah (2016-17) Kehmil division

Closure 59 Rajwar (2018-19) Langate division

Closure 51 Magam/ Zafarkhani (2015-16) Kamraj division

Closure 125/NL sulkote (2015-16) Kamraj division

Closure 91a/NL Khudi (2014-15) Kamraj division

Closure 35 BNR (2018-19) JV division

Closure 68 Kaitwal (2013-14) JV division

Closure 69 R (2015-16) Soil & Water Conservation division (Kupwara)

Closure 5-6 Dobi Mohalla DRSM work (2018-19) Soil & Water conservation division (Kupwara)

Closure 22 Sindh (2015-16) Sindh Division

Closure 15 MBl (2018-19) Sindh division

Closure 109/Kh (2012-13) Bandipora division

Closure: Soil Watlab (2015-16) Bandipora Division

Closure N3 Chelyan (2018-19) Pir Panjal Division

Closure D 34 a (2015-16) Pir Panjal Division

Closure S 26 (2014-15) Tangmarg Division

Closure 47 Gul (2012-13) Tangmarg Division


Closure 30/N Akhal (2018-19) Kulgam Division


Closure V 31-32 (2012-13) Kulgam Division

Strip Plantation Industrial estate (2018-19) Social Forestry Pulwama

Closure 28/N (2014-15) Social Forestry Anantnag

Closure 6-7K (2015-16) Soil & Water Conservation Annatnag

Closure 7 B (2017-18) Soil & Water Conservation Anantnag

Closure 56 K/Hallen (2012-13) Anantnag Division

Closure 64 K (2015-16) Anantnag Division

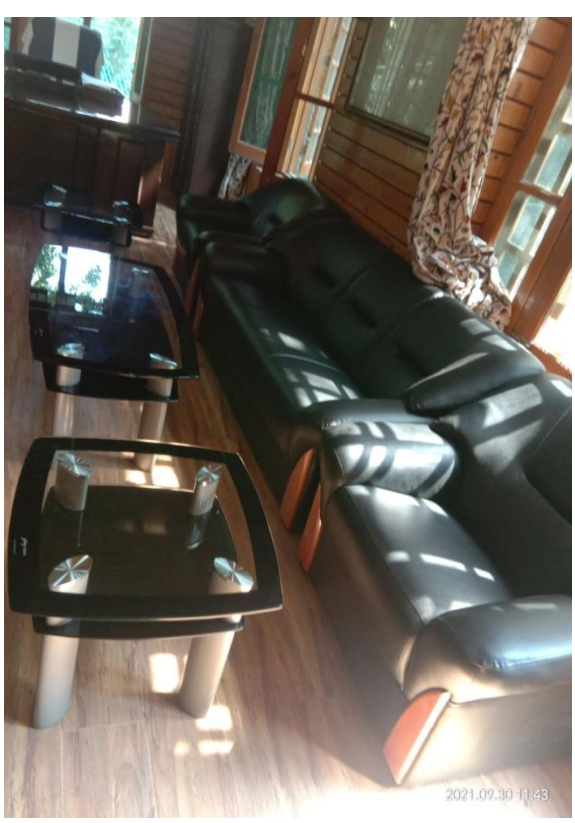
Closure 18L (2012-13) Lidder Division

Closure 17L (2015-16) Lidder Division

Closure 47 L (2015-16) Wildlife Anantnag Division

Closure Pannar(2014-15) Wildlife Anantnag Division

Staff QTR OVARA constructed in Year (2018-19) Wildlife Division Anantnag Scheme. CAMPA



Sofa, table & Curtains purchased under CAMPA in Langate Division

Sheikul Alam Nursery Kanidajan Yousmarg Pir Panjal Division

Sheikul Alam Nursery Kanidajan Yousmarg Pir Panjal Division

Seeds of *Atropa belladonna* & *Abies pindrow* sown in root trainers at Sheikul Alam Nursery Kanidajan Yousmarg Pir Panjal Division

Annexure - 1

Survey Tools

1: Plantation Site Evaluation Data Sheet

1.0 Location Data

1.1 Division: …….

1.2 Forest Range: ……

1.3 Forest Beat: …….

1.4 Compartment No.: ……..

1.5 District: ……..

1.6 Name of the Plantation Site: ……

1.7 Plantation Model: ……

1.8 Landmark: ……

1.9 Display Board at Site: Y/N, if Y size …… (take photograph)

1.10 Year of plantation: ……

1.11 Total area planted (Ha): ……

1.12 Actual area using GPS (Ha): ……

1.13 Aspect: ……

Longitude	Latitude	Altitude

1.14 Distance of site from motorable Road ……

1.15 Distance of site from Habitation ……

1.16 Distance of Site from Range/Division Office: ……

1.17 Geological Formations of the Site ……..

……..

……..

……..

1.18 No. of Plants planted per ha:……..

1.19 Total No. of Plants Planted & Species

S. No.	Name of species	Number
1		
2		
3		
4		
5		
6		

1.20 Source of Saplings: ……..

1.21 Direct sowing if any:

S. No.	Name of species	Area
1		
2		
3		
4		
5		
6		

1.22 Distance of the nursery from the plantation site (Km.): ……

1.23 Size of sapling (nursery):

S No.	Species	Size of sapling
1.		
2.		
3.		
4.		

1.24 Mode of transportation: ……

1.25 % of Damaged saplings during transportation: …….

2.0 Other Intervention Components in and around the site …….
Contour Trench

V-Ditches

Water hole

Fencing

3.0 Terrain Description (write about soil, rock, water source, surroundings etc.)

……

……

……

……

……

……

4.0 Type of Participation by Villagers

……

……

……

5.0 Fencing status

Barbed Wire Fence					
Barbed Wire Fence Id / No.	**Length in Measurement Book**	**Actual Length in field**	**% variation (+/-)**	**Present status – Intact/Worn out**	**Effectiveness of the Fence (Very effective / Moderately effective / Not effective**

Chain Link Fence					
Chain Link Fence Id / No.	**Height X Length in Measurement Book**	**Actual Size (Height X Length) in field**	**% variation (+/-)**	**Present status – Intact/Worn out**	**Effectiveness of the Fence (Very effective / Moderately effective / Not effective**

6.0 Cost of fencing

……

……

7.0 Biotic Pressure Status

7.1 Incidence of Grazing ……

7.2 Incidence of fodder collection ……

7.3 Incidence of NTFP collection ……

7.4 Incidence of Logging ……

7.5 Incidence of fire ……

7.6 Other biotic pressure ……

8.0 Enumeration Sheet

S. No.	Sample Plot No	GPS coordinates of center of plot	Size of plot (32mx32m)	Species	Spacing of plantation (in mt.)	No. of Surviving Plants	No. of Dead Plants	Regeneration Status, if any
1								
2								
3.								
…..								

8.1 Growth parameters

Growth Parameters						
Sl. No.	Species	Plants No.	Height (cm)	Girth (B/C) cm		
				B	C	Crown condition
1.						
2.						
3.						
4.						
……..						

Name of Evaluator ……..

Name & designation of Officer interacted…….

Signature of Evaluator ……..…….. Signature of Officer Interacted ……..…..

Date of Enumeration ……..

2: Soil and Water Harvesting Structure Evaluation Data Sheet

1.0 Location Data

1.1 Division: ……..

1.2 Forest Range: ……

1.3 Forest Beat: ……..

1.4 Compartment No.: ……

1.5 District: ……..

1.6 Name of Village: ……..

2.0 Dimension of the Structure

DRSM/ Crate ID No.	GPS Coordinates	Type of structure	Year of construction	Size (Width*Depth * Length) as in Measurement Book (m)	Size (Width*Depth*Length) as per Actual Size in field (m)	Present Status

2.1 Financial details

DRSM/ Crate ID No.	Total Cost Incurred (Rs.)	Maintenance done (Y/N)	Cost incurred in Maintenance (Rs.)	When (year)	Details of maintenance works done

2.2 Water retention at the time of visit, retention period and use pattern:

DRSM/ Crate ID No.	Water retention Ample (1) Moderate (2) Poor (3) No Water (4)	Retention Period Less than 1 month (1) Less than 3 months (2) Less than 6 months (3) Throughout the year (4)	Use Pattern For Irrigation (1) For Cattle Thirst Quenching (2) For Human Bathing (3) As drinking water for human (4) Any Other (specify) (5)

2.3 Process of site selection, kindly mark (√)

DRSM/ Crate ID No.	By Community	By Forest Department	By Engineering Wing of Forest Department	Through Participatory Approach

2.4 Total Area Impacted by the asset (ha)

DRSM/ Crate ID No.	Arable	Non-arable	Forest

2.5 Impact on Ground Water Recharge {Improved-(1), Constant-(2), Decreased-(3)}

DRSM/ Crate ID No.	Well water level	Hand pump water availability	Pond water level

2.6 Maintenance of assets created

DRSM/ Crate ID No.	Status (Well maintained / Not maintained)

2.7 Benefit sharing mechanism, if any: ……..

2.8 Present status of the assets (take 3 photograph of each asset from different angles):

……

……..

……..

……..

Name of Evaluator ……

Name and designation of official Interviewed…….……

Signature of Evaluator …….……..

Signature of Officer Interacted ……..

Date of visit ……..

3: Wildlife Habitat Improvement Evaluation Data Sheet

1.0 Location Data

1.1 Division: ……..

1.2 Forest Range: ……

1.3 Forest Beat: ……..

1.4 Compartment No.: …….

1.5 District: ……..

1.6 Name of Village: ……..

2.0 Wildlife Habitat Improvement

Habitat Development ID No.	Year	Assets	Area (Width*Depth * Length) as in Measurement Book (m)	Actual Size (Width*Depth*Length) as per Actual Size in field (m)	% Variation

Remarks: Presence or indirect signs – pellet, dung, nests, sighting records of all works done in Wildlife Habitat Improvement.

Note: *Collect physical and financial reports.*

Name of Evaluator ……

Name and designation of official Interviewed……

Signature of Evaluator ……..

Signature of Officer Interacted ……..

Date of visit ……..

4: Civil Works Evaluation Data Sheet

1.0 Location Data

1.1 Division: ……..

1.2 Forest Range: ……

1.3 Forest Beat: ……..

1.4 Compartment No.: ……

1.5 District: ……..

1.6 Name of Village: ……..

2.0 Civil Works

Building Works (Office, Residential quarter, Barricade, Forest camp, Pump house, etc.)	
Building Id	

Site Location	**Good / Fair / Poor**
Serving the intended purpose	**Good / Fair / Poor**
Structurally sound and free of cracks	**Good / Fair / Poor**
Free of dampness and leakage	**Good / Fair / Poor**
Overall finish and look	**Good / Fair / Poor**

Name of Evaluator ……

Name and designation of official Interviewed……

Signature of Evaluator ……..……..

Signature of Officer Interacted ……..

Date of visit ……..

5: Equipments Evaluation Data Sheet

(Note:- This information needs to be collected at divisional office level only)

1.0 Location Data

1.1 Circle: ……

1.2 Division: ……..

2.0 Equipments and Vehicle Status

S. No.	Equipment	Purchased during the year							Total No. purchased	No. of Working units	No. of non-functional units
		2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019			
1	Computer										
2	GPS										
3	Lab Equipments										
4	Vehicle										
5	Other specify										
	Total										

Name of Evaluator ……

Name and designation of official Interviewed……

Signature of Evaluator ……..……..

Signature of Officer Interacted ……..

Date of visit ……..

6: EPA Asset Evaluation Data Sheet

1. **General Information:**

   1.1 Name of Village: ……

   1.2 Division: ……

   1.3 Range: ……..

   1.4 Compartment No.: ……

   1.5 Forest Beat: ……

2. Type of Asset Created: ……

3. Selection process:
   a. Community demand ☐ c. Imposition by Forest Deptt. ☐
   b. Scientifically selected by engineering wing ☐ d. Any other: ☐

4. Placement of Asset: ……

5. Dimensions: ……

6. Total Cost Incurred: ……

7. Year of Construction: ……

8. Present Status of the Asset: ……

9. Sustainability: ……

10. Usefulness of Assets: ……

11. No. of People Benefited: ……

Name of Person Contacted: …… Evaluator's Name: ……..

Designation: …… Signature: ……

Signature: …… Date: ……

7: Questionnaire for Range Officers/DFOs/DCFs/CFs

1. Information

Name –…….. Designation – ……

Circle – …….. Division – ……..

Forest Range – ……

2. What is the basis for selection of sites for plantation:

3. In your view whether the site selection for treatment was good? Y/N

4. What is the basis for selection of the interventions like species / structures/areas for:

a. Afforestation Model

b. Water Harvesting Structures e.g. Check dams (Masonry / vegetative), Anicuts, DLTs

c. Contour trenching, terracing, diversion drains, contour bunding, gully plugging.

d. Upstream/Downstream treatment

e. Silvi-Pasture development

5. Is the compartment history maintained and regularly updated?

6. Do you have plantation journal, is it regularly updated / maintained?

7. Do you have management plan for wildlife?

8. Types of infrastructure created for the implementation of project?

9. Was the planning top down/ bottom up / mix?

10. Sowing Vs Planting (naked root / Potted)

11. Is there any land use board or any other institution existing / operating in the state level for co-ordination of overall catchment area treatment in the state? If so, is it effective?

12. What is the current institutional structure / at field for co – ordination of various soil conservation works in the catchment area by different department / agencies?

13. What is the interval of inspection? Where the inspection observations are noted, how these are disseminated & follow up action taken, recorded?

14. Comment on the internal monitoring:

i. What kind of reporting mechanism is put in place?

ii. Whether reports are periodically / regularly submitted?

iii. What were your major observations during Internal monitoring?

15. Whether the work site registered online at http://egreenwatch.nic.in/? (Yes / No) ☐

16. What measures (including watch and ward) have been adopted for protection and maintenance of assets created under CAMPA?

(The quantity equality of such measures and their effectiveness to be brought out.)

17. Comments on Maintenance of records

- **Nursery Journal**

- **Plantation Journal**

- **Measurement Books**

18. What are the constraints you faced during the implementation of project in?

i. Afforestation

ii. Water Harvesting Structures

iii. Downstream treatment

iv. Silvi-Pasture development

v. Soil moisture conservation

19. What is the incidence of fire in your area?

20. What is the incidence of grazing in your area?

21. What is the incidence of illicit cutting / felling in your area?

22. Was there any community demand for the project? If yes, when and what type of?

23. Was there any conflict with any stake holder during the implementation of project? If yes, what kind and how did you resolve?

24. What is local people's understanding and expectation from the project now?

25. Programme Constraints/Limitations/Funds Flow

26. Whether the project should be continued on the same lines or some modification are necessary?

27. Suggestion for Management

Name of Investigator …….

Name and designation of officer Interviewed ……

Signature of Investigator…… Signature of Officer Interviewed …….

Date of Interview ……..

8: Data Format for JFM

1. Name & Address of JFMC

2. Year of Constitution

3. Executive Committee Details

Post	Name	Occupation	Gender (M/F)	Social Category			
				General	OBC	SC/ST	Minority

4. Are the Chairperson and Treasurer elected or nominated?

5. Education level of Chairman and Treasurer

	Intermediate	Up to Senior Secondary	Above Senior Secondary
Chairperson			
Treasurer			

6. Bank Account Details:

   - Name of the Bank-
   - Branch-
   - Date of Opening of Account-
   - Current Balance-
   - Whether passbook is regularly updated-

7. Total Budget sanctioned and amount retained till date

8. Selection of EPA assets
    - Imposed by Forest Officials
    - Proposed by Community

9. Type of EPA asset, its current physical status and end use pattern

10. Frequency of EBM and GBM

11. Normal Attendance level during EBM and GBM

12. Are the proceedings recorded? □ Yes □ No

    Who writes the proceedings……..

13. Process of Consensus made on Emerging issues

14. Activities performed through your JFM
    - Plantation
    - EPA
    - Soil Moisture Conservation
    - SHG formation and IGA

15. Status of SHGs supported by You

    Number of SHGs-

    Number of Members-

    Composition of SHG-
    -Men
    -Women

16. IGAs undertaken by SHGs and their status

17. Status of Revolving Fund

Loan Given To	In Rs	Data	Balance on Today
SHG1			
SHG2			
SHG3			

Loan Repayment	In Rs	Data	Balance on Today
SHG1			
SHG2			
SHG3			

18. Is Village Development Fund (VDF) available? If yes, mention current balance.

19. SHGs' contribution to Forests

20. Participation in Forest Activities

21. Social Risk Involved in Plantation Activities

Name of Investigator …….

Name and designation of officer Interviewed ……

Signature of Investigator…… Signature of Officer Interviewed …….

Date of Interview ……..

9: PRA (Facilitation Sheet for Community)

1. **Are you aware about the CAMPA Project? If yes. what do you know about it?**

2. **Was there any demand from you for the plantation, EPA, WHS, etc.?**

3. **Were You or the community in any way involved**

(a) In the planning of the project? If Yes, how & when give details

(b) In the implementation of the project? If Yes, how & when give details

(c) In the maintenance of the project components (Afforestation / Pasture development, downstream treatment, soil conservation measures)? If Yes, how & when. Give details

4. **Whether site selection for plantation was good?**

5. Did any type of conflict arise in regard to:

S. No.	Particulars	Type of Conflict	Conflict between whom	Measures taken to resolve conflict
1	Need for the project			
2	Planning of the project			
3	Implementation of the project			
4	Maintenance of the project			
5	Usufructs rights and its sharing			
6	Benefit sharing from project components			
7	Any other			

6. Are you aware about the overall land-use pattern of the catchment area

Land Type	Total Area	Percentage
Forest (Dense, Open, scrub, Grassland)		
Agriculture		
Homestead		
Wasteland including exposed rocks		
Other Category		

7. Status of

S.No.	Particulars	Before the project was implemented	Present Status
1	Land Slip		
2	Soil Erosion		
3	Floods		
4	Flash floods		
5	Siltation		

8. Status of the following in the Project Area

Type	Before implementation of the project	Present
Fodder		
Fuel wood		
Medicinal Plants		
Agriculture		
Irrigation		
Water Supply		
Water Quality		
Electricity		
Others		

9. What is the incidence of fire in the forest Land?

(a) High ☐

(b) Moderate ☐

(c) Low ☐

(d) Absent ☐

10. What is the incidence of the grazing in the forest Land?

(a) High ☐

(b) Moderate ☐

(c) Low ☐

(d) Absent ☐

11. Details about Rotational Grazing pattern

Site Name	Total Area	Season (in Months)

12. Incidence of illegal cutting of trees/ poles

(a) High ☐

(b) Moderate ☐

(c) Low ☐

(d) Absent ☐

13. What is your perception for the project now?

14. If project is to be continued, do you have any specific suggestion for improvement? If yes give details.

15. Any other remarks.

Name of Facilitator ……..……..

Signature of Facilitator ……..…….. ……..

Date of PRA ……..

Name and Signature of Participants

	Name	**Signature**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

10: Data Format for SHGs

1. **Name and Address of SHG …….**

2. **Date of Formation ……**

3. **Membership Detail**

Person	Designation	Age	Gender	Education Level	Occupation

4. **Status of Bank Account**

Name of Bank ---------- Branch ----------

Account Number ----------

Date Last Updated ----------

Current Balance Rs. ----------

5. **Members Saving Details**

Amount Per Individual Per Month …….

Total Savings till Date ……..

Number of Defaulting Members and Recovery Mechanism…….

Whether Members Passbook Updated ……..

6. **Intra Loaning Status**

Total Loans Dispersed Till Date ……

Common purposes of Loan ……

Interest Rate ……

Money Recovered……..

Process of Sanction ……

Mechanism of Recovery of Bad Loans ……

…….

7. **Frequency of Meetings**……

8. **Number of Members attending the Meeting (Averaged)** …….

9. **Are the Proceedings of Meetings Recorded** ……

10. **Who writes the Proceedings**……..

11. **Training and Capacity Building**

    By Whom……..

    Subjects ……

    Frequency ……..

    Lessons Learnt ……..

12. **IGA undertaken**

    Date of Commencement …….

    Individuals Income by IGA ……

    Benefit Sharing Mechanism …….

13. **Participation in Forestry Activities …….**

14. **Whether any Member in EC of JFM……..**

15. **Types of Conflict Emerging and Conflict Resolution Mechanism Adopted**

16. Revolving Fund Received from JFM…….

17. Money Returned to Revolving Fund……

18. Seed Money Received from Project…….

19. Whether Underwent Exposure Tour? Yes/ No

If Yes, Where, When and Why ……

……..

20. Overall Benefit Received from the Project ……

……

21. Observation and Suggestions ……

……..

……

Name of Investigator …….

Signature of Investigator……

Date of Interview ……..

The Compensatory Afforestation Fund Management & Planning Authority (CAMPA)

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