

Chapter 1

INTRODUCTION

1.1 About CAMPA

Forests are generally used for the lifestyles and the wellbeing of forest dwellers. The local population and other people/species directly or indirectly are dependent on forests. Forests are also used for the nature reserve, national park, wildlife sanctuary, biosphere reserve, as a habitat of endangered/ threatened species of flora and fauna. Forest land is generally diverted for non-forestry purpose under the Forest (Conservation) Act, 1980 for facilitating developmental activities like construction of power projects, irrigation projects, roads, railways, schools, hospitals, rural electrification, telecommunication, drinking water facilities and mining, etc.¹

Compensatory Afforestation Management and Planning Authority (CAMPA) is a body constituted by the Central government as a consequence of the Supreme Court's order in 2002. The cost of creating the compensatory forest is borne by the 'User Agency' proposing the forest diversion for its project, which can be a public or private sector enterprise or a government body owning the project. Whenever development projects seek land inside a Reserved Forest or a Protected Area (PA), such as a wildlife sanctuary or a national park, certain levies are imposed by the government on the project proponent (the User Agency) towards compensatory afforestation (CA), additional compensatory afforestation (ACA), penal compensatory afforestation (PCA), net present value (NPV) of forestland, catchment area treatment (CAT) plan funds, etc.²

In April 2004, the Central Government, under the orders of the Honorable Supreme Court, constituted the CAMPA for the management of money towards CA, NPV and other money recoverable, in compliance of the conditions stipulated by the central government and in accordance with the Forest (Conservation) Act, 1980. The CAMPA functions under the supervision of the Central Government in the Ministry of Environment, Forests & Climate Change (MoEF&CC). Its jurisdiction extends to the whole of India. Under CAMPA, large-scale activities have been taken up to accelerate preservation of natural forests, management of wildlife, capacity building, research & development, infrastructure development in the sector and other allied works.

The Ministry of Environment and Forests, Government of India, in their letter dated 2 July 2009 have issued the Guidelines on State Compensatory Afforestation Fund Management and Planning Authority (State CAMPA). Based on these guidelines, the Government of Andhra Pradesh, in their G.O.Ms.No.78, E.F.S.& T (For. I) Department dated 11 September 2009 issued orders establishing the Andhra Pradesh State Compensatory Afforestation Fund Management and

¹ Compensatory Afforestation in India: Report no 21of 2013

² CAMPA Fact Sheet: A Compromised Composition CAF Bill and PSC Report, CSE, 7p.

planning authority (A.P. State CAMPA). The main purpose enunciated in the Notification is enhancement of forest and tree cover and conservation and management of wildlife by utilizing funds received towards CA, NPV etc. in compliance to the conditions stipulated by the Central Government while according approval under Forest (Conservation) Act, 1980 (69 of 1980) for non-forest uses of the forest lands.³

With the Compensatory Afforestation Fund Bill 2016 (*hereafter referred to as 'the Bill'*), the Government of India now seeks to make this corpus available to state governments to initiate necessary compensatory afforestation programmes, independent of the Supreme Court. The Bill provides for an institutional mechanism to ensure 'expeditious utilization' of the amounts collected from the diversion of forestlands till present.

1.2 Necessity of CAMPA

The necessity of CAMPA is to compensate for the loss of tangible as well as intangible benefits from the forest lands which were diverted for non-forest use compensatory afforestation is required to be done over an equivalent area of non-forest land or double the amount of degraded forest land in relation to the actual area being diverted. If clearances for diversion of forest land are granted, certain levies are imposed on the project proponents by the Government to compensate for the loss of forestlands, and this money is to be utilized for afforestation activities elsewhere. This concept is 'Compensatory Afforestation', defined as 'afforestation done in lieu of the diversion of forest land for non-forest use under the Forest (Conservation) Act, 1980 (ref. 5). In order to determine the cost of compensatory afforestation, the appropriate authority will evaluate the area of the forest area/degraded identified for compensatory afforestation. From such money, a huge corpus of over 42,000 crores has accumulated into accounts of Ad hoc CAMPA, a temporary body set up in 2006 by the Supreme Court to manage such funds. The corpus is increasing at the rate of about 6,000 crores per year. The disbursement of funds under the corpus to state governments was previously supervised by the Supreme Court to ensure effective monitoring and regulation of these funds.⁴

CAMPA fund is to be used for assisted natural regeneration (ANR), natural forest management, forest protection, biodiversity conservation, infrastructure development, wildlife

³ Manual of Guidelines and Accounting Procedure on works relating to A.P. State Compensatory Afforestation Fund Management and Planning Authority (A.P. State Campa), 38p.

⁴ Text of the Supreme Court Order, dated 10 July 2009, on National and State CAMPAs.

protection and management, the supply of wood and other forest produce saving devices and other allied activities.

1.3 CAMPA in Telangana

Telangana state formed in June 2014 from the northwestern part of the Joint State of Andhra Pradesh has an area of 112,102 square kilometers and a population of 35,193,978.⁵ The notified forest area of the State is 26903.70 square kilometers, which is 23.99% of the geographical area.⁶ The Telangana State Forest Department (TSFD) is implementing CAMPA activities in the state of Telangana since 2009-2010.

³ Census of India (2011).

⁶ Telangana State of Forest report (2014), TSFD, 144p.

Chapter 2

WORKS TAKEN UP UNDER DIFFERENT CAMPA COMPONENTS

This chapter describes the works taken up by TSFD during 2012-2013 under different CAMPA components. Compensatory Afforestation (CA) and Net Present Value (NPV) components for which activities have been undertaken by Telangana State Forest department during 2012-2013 are shown in Fig 2.0.

Fig 2.0: Works undertaken for different CA and NPV components during 2012-2013.

Compensatory Afforestation (CA)	Net Present Value (NPV)
<ul style="list-style-type: none"> ➤ Compensatory Afforestation ➤ Safety Zone ➤ Extraction of Tree Growth in diverted areas ➤ Catchment Area Treatment 	<ul style="list-style-type: none"> ➤ Natural Forest Management (NFM) ➤ Forest Protection (FP) ➤ Forest Fire Management (FFM) ➤ Bio-diversity Conservation and Development (BDC) ➤ Research and Development (R&D) ➤ Capacity Building (CB) ➤ Information Communication and Technology (ICT) ➤ Monitoring and Evaluation (M&E) ➤ Office Support (OS)

2.1 Compensatory Afforestation (CA): The main mandate of Telangana State CAMPA is afforestation of the compensatory area given by the user agency in lieu of the forest areas diverted for non-forestry purposes. Under Compensatory afforestation, planting of trees is carried out on another piece of land equivalent in area to the original forestland diverted for non-forest purposes. It is mandated under the Forest (Conservation) Act, 1980 that compensatory afforestation is done over an equivalent area of non-forestland. Equivalent non-forestland identified for the purpose would subsequently be transferred to the ownership of the State Forest Department and declared as Protected Forests so that the plantation raised can be maintained permanently. Where non-forestlands are not available, compensatory afforestation may be carried out over degraded forest twice in the extent to the area diverted or to twice the difference between forestland being diverted and available non-forestland, as the case may be. The activities under CA head namely CA / Addl.CA / Penal CA / Safety Zone / Extraction of tree growth and Catchment Area Treatment are taken up by TSFD strictly as per the Government of India stipulations while granting the stage - I & II clearances of CA proposals. It also envisages proper demarcation of the CA areas by erecting boundary pillars.

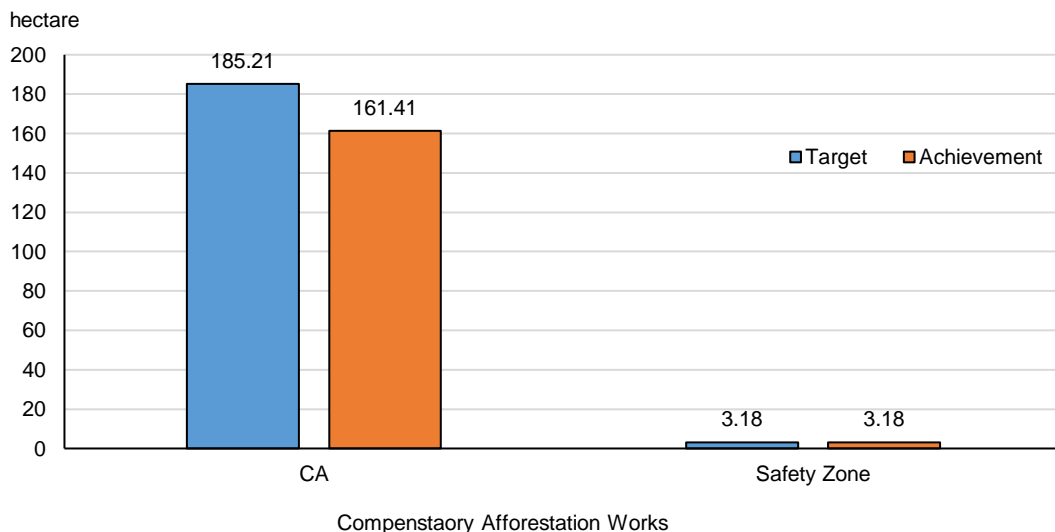
Under CA during 2012-2103, a total of 288 works were undertaken by TSFD with an expenditure of 267.747 lakhs. Division wise total number of works and expenditure under CA is shown in Table 2.1a.

Table 2.1a: Division wise number of works undertaken and expenditure (lakhs) incurred under CA by TSFD, CAMPA during the year 2012-2013.

Name of the Circle	Name of the Division	No of works undertaken	Expenditure (lakhs)
Adilabad	Adilabad	15	21.68809
	Nirmal	1	1.81353
	Mancherial	9	5.70719
	Bellampally	41	35.14597
	Circle-total	66	64.35478
Hyderabad	Hyderabad	1	0.22250
	Mahabubnagar	43	19.13074
	Nalgonda	33	48.131
	Circle-total	77	67.48424
Khammam	Khammam	4	5.65136
	Kothagudam	9	1.46068
	Paloncha	68	62.09031
	Bhadrachalam (N)	7	25.86986
	Bhadrachalam (S)	1	5.69248
	Circle-total	89	100.76469
Nizamabad	Nizamabad	6	1.84097
	Kamareddy	5	10.397
	Medak	17	13.8546
	Circle-total	28	26.09257
Warangal	Warangal (N)	5	0.083
	Karimnagar (E)	2	0.077
	Karimnagar (W)	1	1.446
	Circle-total	8	1.606
FDPT	Achampet	20	7.44487
	Circle-total	20	7.44487
Grand total		288	267.747

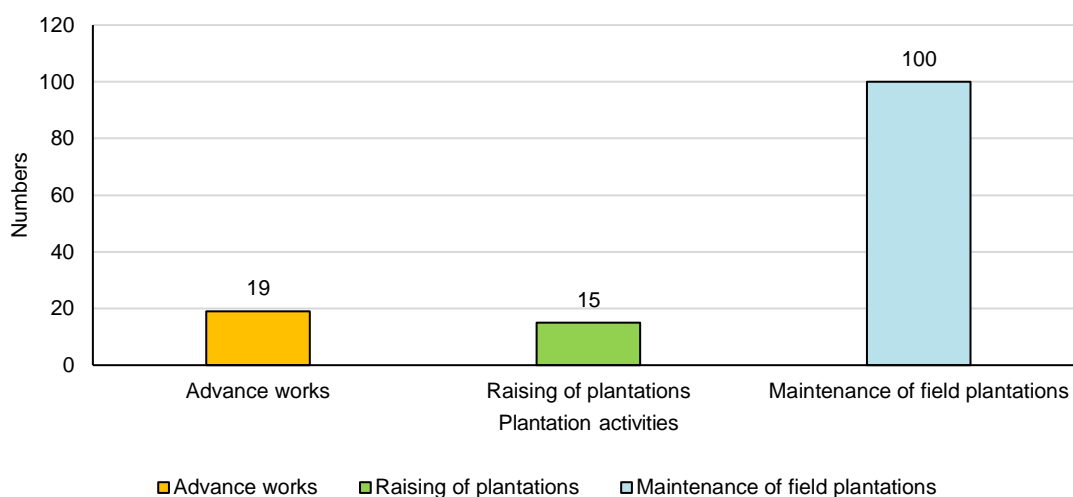
Plantation targets and achievements under CA during 2012-2013 is shown in Fig 2.1a.

Fig 2.1a: Plantation targets and achievements under CA in 2012-13



During 2012-2013, plantations under CA covered 164.59 ha, of which 161.41 ha was achieved under CA and 3.18 ha under safety zone. The main works under plantation activities included advance work including nursery works, raising of forest plantations and maintenance of previously raised plantations. Total plantation works carried out under CA during 2012-2013 is shown in Fig 2.1b

Fig 2.1b: Number of plantation works under CA in 2012-13



Division wise total number of plantation works under CA for the year 2012-2013 is shown in Table 2.1b.

Table 2.1b: Division wise total plantation works under CA by TSFD, CAMPA during 2012-2013.

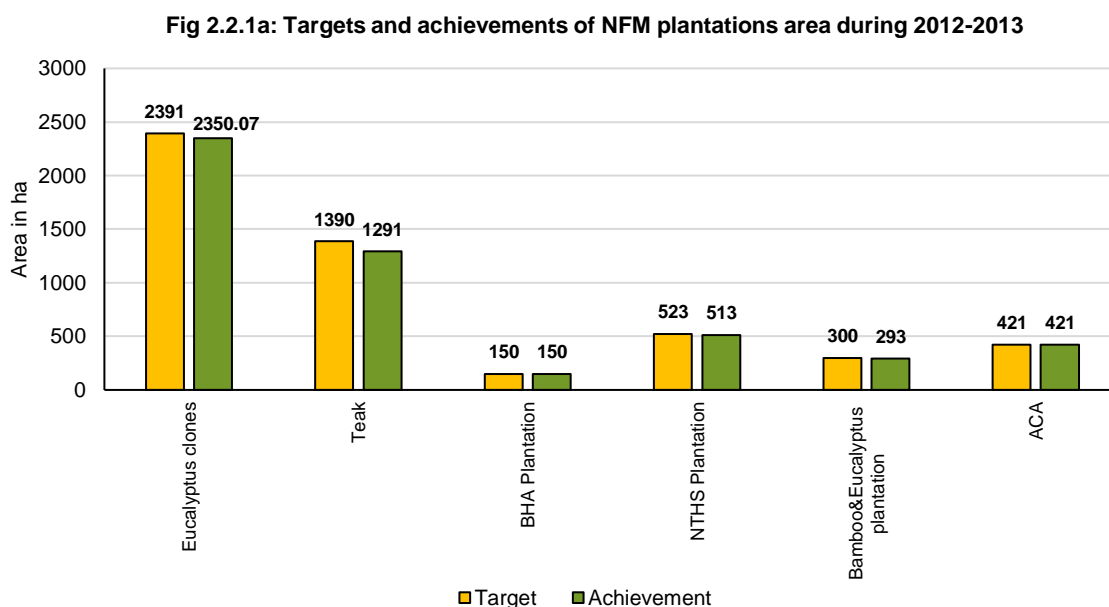
Forest Divisions	Advance Operation	Raising	Maintenance	Total
Achampet	-	-	1	1
Adilabad	-	-	-	-
Bellampally	-	-	-	-
Bhadrachalam (North)	-	-	7	7
Bhadrachalam (South)	-	-	-	-
FG Warangal	-	-	-	-
Hyderabad	-	-	1	1
Kaghnaznagar	-	-	-	-
Kamareddy	-	-	2	2
Karimnagar East	-	-	2	2
Karimnagar West	-	1	-	1
Khammam	-	-	4	4
Kothagudem	7	2	-	9
Mahabubnagar	1	-	1	2
Mancherial	-	-	9	9
Medak	-	4	6	10
Nagarjunasagar	3	1	1	5
Nalgonda	4	4	10	18
Nirmal	1	-	-	1
Nizamabad	-	1	3	4
NZP Hyderabad	-	-	-	-
Paloncha	3	2	52	57
SS Hyderabad	-	-	-	-
Warangal North	-	-	1	1
Warangal South Division	-	-	-	1
TOTAL	19	15	100	134

Under CA other activities, extraction of tree growth in diverted areas and development of soil and water conservation measures were undertaken during 2012-2013. A total of 33000 trees covering an area of 94.710 ha was extracted from diverted areas in Bellampally division under Adilabad circle.

2.2 Net Present Value (NPV): The components of NPV include natural forest management, forest protection, forest fire management, biodiversity conservation and development, research and development, capacity building, information communication and technology, monitoring and evaluation and office support. Each of the NPV components is described in the following sub-sections.

2.2.1 Natural Forest Management (NFM): The purpose of natural forest management treatments is to improve the overall stockings of the natural forests and at the same time to afforest degraded forest areas and improve the productivity of the forests on a sustained yield basis by using appropriate silvicultural and management practices. Under the natural forest treatments, activities were proposed to improve the stockings of natural bamboo in the forests, improve the stockings of teak in the teak bearing Telangana forests and cover the barren hills with indigenous tree species. Management and silvicultural prescriptions were in accordance with the overall prescriptions of the working plan for the given division. Treatment models for improving the productivity of the natural forests for an amount of 1977.67587 lakhs, including certain spillover activities of advance operations of 2011-2012 were spent during 2012-2013 under NFM component.

Targets and achievements of different types of plantation for the year 2012-2013 are shown in Fig 2.2.1a.



Division wise targets and achievements under NFM for the year 2012-2013 is shown in Table 2.2.1.

Table 2.2.1: Division wise physical works (ha) and expenditure (lakhs) abstract of NFM under TSFD, CAMPA for the year 2012-2013.

Name of the Circle	Name of the Division	Target		Achievements	
		Physical (ha)	Financial (lakhs)	Physical (ha)	Financial (lakhs)
Adilabad	Adilabad	235	116.7805	231	75.837
	Nirmal	245	127.11	227	92.568
	Mancherial	330	193.2245	320	129.30845
	Bellampally	350	177.3158	350	142.37257
	Kazagnagar	260	144.63922	260	82.29119
	Circle-total	1420	759.07002	1388	522.37721
Hyderabad	Hyderabad	510	213.546	479.07	187.967
	Mahabubnagar	145	58.246	145.00	56.574
	Nalgonda	130	41.691	132.50	38.0888
	Circle-total	785	313.483	756.57	282.6298
Khammam	Khammam	406	136.062	351	88.78863
	Kothagudam	194	78.981	194	48.529
	Paloncha	266	114.098	266	77.32303
	Bhadrachalam (N)	301	120.702	301	103.8726
	Bhadrachalam (S)	116	47.7044	87	33.692
	WL Paloncha	-	-	-	1.5633
	Circle-total	1283	497.5474	1199	353.76856
Nizamabad	Nizamabad	315	111.166	315	90.961
	Kamareddy	330	32.385	320	98.1089
	Medak	450	107.721	455	295.03749
	Circle-total	1095	251.272	1090	484.10739
Warangal	Warangal (N)	164.00	135.43	164	104.66957
	Warangal (S)	107.50	111.90678	107.50	57.41448
	Karimnagar (E)	157.50	22.807	150	67.378
	Karimnagar (W)	130.00	80.035	130	53.34137
	Circle-total	559	350.17878	551.50	282.80342
R&D	SS Hyderabad	0	18.028	0	17.92853
	FG Warangal	0	12.535	0	29.50089
	Circle-total				47.42942
FDPT	Achampet	33	8.335	33	4.56027
	Circle-total	33	8.335	33	4.56027
Grand total		5175	2210.4492	5018.07	1977.67587

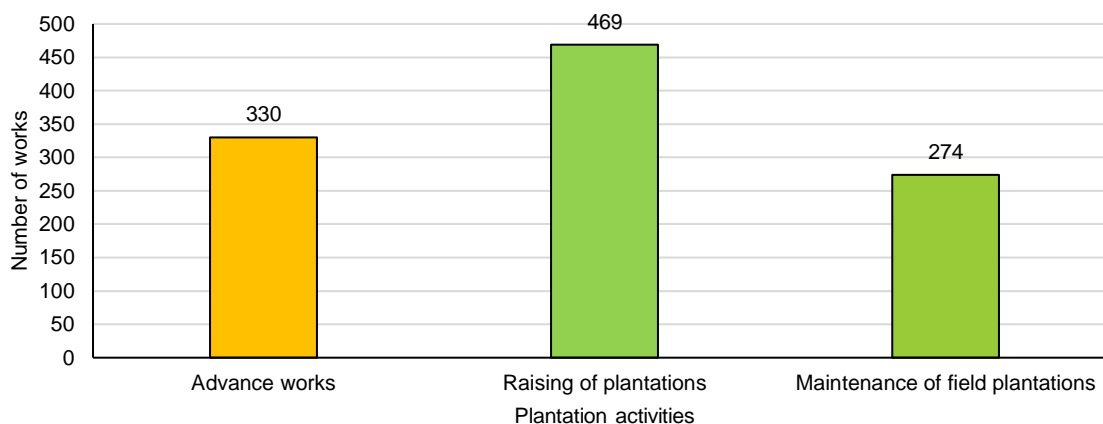
Under NFM during 2012-2013 activities to increase the overall stocking of the natural forest through plantations of various species were undertaken by TSFD. The details of NFM activities are as follows:

- Raising of 1291 ha of teak plantations including cultural operations, decongestion of soil and moisture conservation works, fire tracing, raising & maintenance.
- Raising of 2350.07 ha of Eucalyptus plantations including cultural operations, thinning and tending of coppice shoots, raising & maintenance.
- Raising of 293 ha of bamboo and eucalyptus species including cultural operations, decongestion of soil and moisture conservation works, fire tracing, raising & maintenance.
- Barren hills afforestation in 150 ha with forest species like teak, red sanders, Eucalyptus clones mixed with bamboo, silver oak, sandalwood and indigenous non-teak secondary hardwood species.

- Raising of 513 ha of NTSH plantations including cultural operations, decongestion of soil and moisture conservation works, fire tracing, raising & maintenance.
- ACA raising of 421 ha of plantations (*Annexure I*).

Total number of plantation works carried out under CA during 2012-2013 is shown in Fig 2.2.1b

Fig 2.2.1b: Number of plantation works carried out under NFM in 2012-13



Division wise total number of plantation works under NFM for the year 2012-2013 is shown in Table 2.2.1b.

Table 2.2.1b: Total plantation works undertaken under NFM by TSFD, CAMPA during 2012-2013.

Forest Divisions	Advance Operation	Raising	Maintenance	Total
Achampet	-	1	-	1
Adilabad	19	27	16	62
Bellampally	15	26	13	54
Bhadrachalam (North)	11	20	13	44
Bhadrachalam (South)	-	15	-	15
FG Warangal	-	14	59	73
Hyderabad	24	29	10	63
Kaghaznagar	17	22	5	44
Kamareddy	16	23	3	42
Karimnagar East	12	18	23	53
Karimnagar West	12	15	5	32
Khammam	8	24	3	35
Kothagudem	20	11	5	36
Mahabubnagar	17	13	5	35
Mancherial	8	24	23	55
Medak	53	71	35	159
Nagarjunasagar	4	2	-	6
Nalgonda	8	10	5	23
Nirmal	23	26	7	56
Nizamabad	13	23	2	38
NZP Hyderabad	-	1	-	1
Paloncha	7	19	6	32
SS Hyderabad	-	6	13	19
Warangal North	21	19	18	58
Warangal South Division	22	10	5	37
TOTAL	330	469	274	1073

2.2.2 Forest Protection (FP): Protection of forests is one of the vital responsibility of the forest department. The size of forest beats, sections and ranges have remained unchanged in the state and do not conform to national standards of forest beat, section and range sizes. To supplement the frontline field staffs in their protection efforts it was proposed to continue the existing and establish fresh base camps, strike forces, check posts and police parties. Various initiatives like maintenance and construction of forest boundaries pillars, providing arms to the frontline staff were proposed for improving the protection of the existing forests. An amount of 1394.223 lakh was spent for completing the proposed interventions, the amount also includes spillover works of the year 2011-2012. Activities carried out under FP during 2012-2013 include:

- Base Camps (88 base camps) activities with highest in Adilabad circle (36 base camps).
- Forest Strike Forces (43 nos) activities towards establishment and maintenance.
- Check posts (51 nos).
- Fuel charges and repairs for Departmental vehicles (127 works).
- Communication charges for 1522 personnel.
- Hiring and wages to drivers (112 works).
- Strengthening and maintenance of 38 check posts.
- Translation, scanning, and documentation of Reserve Forest Blocks notifications.
- Construction of protection wall in urban forest areas.
- Construction of quarters for the frontline staffs of which new quarters were sanctioned (47 Nos.) and others constructed with spillover work (102 Nos.).
- Improvement of the communication network and mobility for patrolling duty to frontline forest staff.
- Providing arms and ammunition to the frontline staffs.
- Legal assistance charges.
- Two works under maintenance of dog squads/improvement of camping facilities to the field officers/ control room with 3 protection watchers.
- Purchase of ammunition.

Division wise targets and achievements under FP for the year 2012-2013 is shown in Table 2.2.2.

Table 2.2.2: Division wise physical works (numbers) and expenditure (lakhs) abstract of FP under TSFD, CAMPA for the year 2012-2013.

Name of the Circle	Name of the Division	Target		Expenditure	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
Adilabad	Adilabad	41	79.337	41	85.39311
	Nirmal	45	122.25	45	90.6771
	WL Jannaram	25	84.1	25	71.856
	Mancherial	19	72.982	19	48.62
	Bellampally	19	55.275	19	40.957
	Kazagnagar	19	61.127	19	47.977
	Circle total	168	475.071	168	385.48021
Hyderabad	Hyderabad	28	91.312	28	85.077
	Mahabubnagar	10	12.226	10	20.186
	Nalgonda	10	14.971	10	21.56578
	Circle total	48	118.509	48	126.82878
Khammam	Khammam	41	33.1	41	61.73022
	Kothagudam	48	32.36	48	75.733
	Paloncha	27	41.322	27	54.62751
	Bhadrachalam (N)	24	19.155	24	35.28151
	Bhadrachalam (S)	10	53.905	10	78.93668
	WL Paloncha	17	7.726	17	35.03791
	Circle total	167	187.568	167	341.34683
Nizamabad	Nizamabad	27	13.968	27	47.3438
	Kamareddy	28	11.378	28	31.129

Name of the Circle	Name of the Division	Target		Expenditure	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
	Medak	19	15.595	19	41.63445
	WL Medak	5	0.273	5	11.69631
	Circle total	79	41.214	79	131.80356
Warangal	Warangal (N)	33	51.1525	33	63.13436
	Warangal (S)	25	94.044	25	73.38469
	WL Warangal	17	15.975	17	29.714
	Karimnagar (E)	20	35.744	20	48.031
	Karimnagar (W)	25	58.975	25	51.77761
Circle total	120	255.8905	120	266.04166	
FDPT	Achampet	71	113.147	71	119.322
	Circle total	71	113.147	71	119.322
WLM Hyd	CNP	3	11.578	3	5.535
	D.F.O	6	7.04	6	11.634
	Circle total	9	18.618	9	17.169
Zoo Park	Zoo Park	5	6.23	5	6.231
TOTAL		667	1216.248	667	1394.223

2.2.3 Forest Fire Management (FFM): The forest areas in Telangana are subjected to damage due to annual ground fires in the summer season. The protection of regeneration of forest areas from fire damage is essential for improving the stocking in the forests and for providing fodder for the wild herbivores. An amount of 20.0025 lakh was spent on interventions under this component. Major activities under FFM during 2012-2013 include:

- Creation of fire lines (356 km) and control burning along extraction/bridle paths through (465) nos. of fire watchers.
- Fire watchers (for 4 months in a year during fire season) 60 watchers.

Division wise targets and achievements under FFM for the year 2012-2013 is shown in Table 2.2.3.

Table 2.2.3: Division wise physical works (numbers) and expenditure (lakhs) abstract of FFM under TSFD, CAMPA for the year 2012-2013.

Name of the Circle	Name of the Division	Sanctioned Cost		Expenditure	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
Adilabad	WL Jannaram	15	1.24	1	0.172
	Bellampally	15	1.488	16	1.488
	Circle total	30	2.728	17	1.66
Hyderabad	Hyderabad	19	1.6	19	3.264
	Mahabubnagar	2	0.8	6	2
	Nalgonda	2	0.96	3	2.28
	Circle total	23	3.36	28	7.544
Nizamabad	Nizamabad	-	-	7	1.692
	Kamareddy	-	-	5	0.943
	Medak	-	-	6	2.6105
	WL Medak	-	-	1	1.8
	Circle total	0	0	19	7.0455
Warangal	Achampet	22	2.23	4	0.528
	Circle total	22	2.758	4	0.528
WLM Hyd	CNP	-	3.225	1	3.225
Grand total		75	11.543	69	20.0025

2.2.4 Biodiversity Conservation (BDC): The Telangana state is endowed with rich flora and fauna with more than 3000 plant species, 400 bird species, 80 mammalian species and more than 50 reptilian species. Under this component during the year 2012 - 2013 an expenditure of 520.9612

lakhs was made by TSFD. Initiatives for the conservation of biodiversity and development in the National Parks and Protected Areas undertaken by TSFD during 2012-2013 are listed below:

- Wildlife habitat improvement (279 works).
- Fringe area development (100 ha).
- Augmentation of water sources.
- Man-animal conflict 6 numbers.
- Wildlife research & data collection / Revival of wireless network (22 cases).
- Maintenance of deer parks & animal complex (2 nos).
- *Ex situ* conservation of breeding programme in *ex-situ* (3 nos).
- Wildlife environmental extension & education (5 nos).
- Improvement of zoo parks / Consultancy for bringing the zoos of the state of international standards / Water resource management (126 cases).

Division wise targets and achievements under BDC for the year 2012-2013 is shown in Table 2.2.4.

Table 2.2.4: Division wise physical works (numbers) and expenditure (lakhs) abstract of BDC under TSFD, CAMPA for the year 2012-2013.

Circle	Divisions	Target		Achievements	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
Adilabad	Nirmal	173	19.483	36	15.112
	WL Jannaram	83	64.737	120	66.54101
	Circle total	256	84.22	156	81.65301
Hyderabad	Hyderabad	0	5.405	11	13.989
	Mahabubnagar	0	15.725	28	20.765
	Circle total	0	21.13	39	34.754
Khammam	Bhadrachalam (S)	5	2.4	5	2.4
	WL Paloncha	0	42.46	65	37.62044
	Circle total	5	44.86	70	40.02044
Nizamabad	Nizamabad	0	3.25	2	0.675
	Kamareddy	0	3.32	11	1.26
	Medak	0	0	1	0.374
	WL Medak	0	12.088	57	57.54911
	Circle total	0	18.658	71	59.85811
Warangal	Warangal (N)	0	0	23	4.6859
	WL Warangal	0	39.797	115	111.393
	Karimnagar (W)	36	28	30	25.35176
	Circle total	36	67.797	168	141.43066
FDPT	Achampet	0	22.491	41	13.033
	Circle total	0	22.491	41	13.033
WLM Hyderabad	CNP	0	21.936	29	85.824
	D.F.O	0	157.523	23	58.928
	Circle total	0	179.459	52	144.752
Zoo Park	Zoo Park	0	161.5	2	5.46
	Circle total	0	161.5	2	5.46
Grand total		297	611.199	599	520.9612

2.2.5 Research and Development (R&D): The forest department has undertaken applied forestry research in a number of fields for improving the growing stock of forests species and development of genetically superior and high yielding variety of various species. A total amount of 157.4227 lakhs was spent under this component during 2012-2013. The major interventions include

- Strengthening of existing infrastructure,
- Procurement of machinery and equipment i.e. soil testing kits, tree crop measuring devices, pH meter etc.
- Tree breeding activities and documentation,
- Clonal forestry research,
- Seed technology,
- Domestication of indigenous fast-growing species,
- Tissue culture seedlings,
- Improvement of nursery technology, production of quality planting material, and
- Standardization of Natural Forest Management models.

Division wise targets and achievements under R&D for the year 2012-2013 is shown in Table 2.2.5.

Table 2.2.5: Division wise physical works (numbers) and expenditure (lakhs) abstract of R&D under TSFD, CAMPA for the year 2012-2013.

Name of the Circle	Name of the Division	Sanctioned Cost		Expenditure	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
R&D	Bellampally	-	-	1	0.24
	SS Hyd	155	91.06	154	88.07319
	FG WGL	170	68.54	171	69.10954
Grand total		325	159.61	326	157.4227

2.2.6 Capacity Building (CB): The Forest Academy, Dullapally is the premier institute selected by the Government of India for imparting training to range officer trainees of the country. It also trains the in-service FBOs and FSOs to discharge their duties effectively. An amount of 429.89032 lakhs is provided under the component for the following activities:

- Provision of hostel facilities with Auditorium for Range officer trainees.
- Provision of a Training Centre for Capacity Building of forest staff.
- Organizing workshops/trainings for frontline staff, other forest officers / various communities engaged in forest improvement and protection.
- Conducting of specialized training in Wildlife, Research and Development, GIS, etc.,
- Direct Recruitment process of frontline staff and training.

Division wise targets and achievements under CB for the year 2012-2013 is shown in Table 2.2.6.

Table 2.2.6: Division wise physical works (numbers) and expenditure (lakhs) abstract of CB under TSFD, CAMPA for the year 2012-2013.

Name of the Circle	Name of the Division	Capacity Building			
		Sanctioned Cost		Expenditure	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
APFP Dullapally	Dullapally	57	554.26	94	429.89032
Grand total		57	554.26	94	429.89032

2.2.7 Information Communication and Technology (IC&T): TSFD is the pioneer in obtaining satellite data, analyzing and interpreting it and creating a database for monitoring and improving

the forest cover. The information obtained from the satellite imageries are analyzed and areas prone to fire damages have been categorized as high risk and moderate zones. This base information has been utilized for laying and maintaining the fire lines in the forests. CAMPA MIS is also being developed to capture and monitor the implementation of the activities under CAMPA. An amount of 301.688 lakhs has been spent in this component. Division wise targets and achievements are shown in Table 2.2.7. Major interventions under ICT component during 2013 include:

- Broadband and internet connections.
- Maintenance of geomatics ARC GIS server
- Monitoring of vegetation cover change within and outside the forest.
- Development of Web-enabled FMIS Package, Website Development for GIS-MIS Integration
- DEM generation, Stock Mapping, Density Mapping, Forest Fire Atlas Maps, WHS Maps etc.
- Survey of boundaries using modern technology
- Refining of Forest Fire Atlas Maps and WHS Maps.

Table 2.2.7: Division wise ICT works (numbers) and expenditure (lakhs) during the year 2012-2013.

Circle	Divisions	Target		Achievements	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
Adilabad	Adilabad	14	8.4	2	7.906
	Nirmal	14	8.4	7	6.275
	WL Jannaram	8	4.8	8	4.386
	Mancherial	12	7.2	5	6.099
	Bellampally	12	7.2	6	6.986
	Kazagnagar	10	6	7	5.78409
	Circle total	70	42	35	37.43609
Hyderabad	Hyderabad	0	10.105	5	13.68331
	Mahabubnagar	0	3.5	5	5.91937
	Nalgonda	0	2.465	3	3.49602
	Circle total	0	16.07	13	23.0987
Khammam	Khammam	0	2.675	10	5.55111
	Kothagudam	0	3.5	8	7.8786
	Paloncha	0	3	6	5.94789
	Bhadrachalam (N)	0	1.2	-	5.7769
	Bhadrachalam (S)	0	2.97	7	7.248
	WL Paloncha	0	1	2	2.28
	Circle total	0	14.345	33	34.6825
Nizamabad	Nizamabad	0	1.5	6	6.041
	Kamareddy	0	1.5	7	5.935
	Medak	0	3.2	8	10.25344
	WL Medak	0	0	2	1.19996
	Circle total	0	6.2	23	23.4294
Warangal	Warangal (N)	0	4.07	12	7.93564
	Warangal (S)	0	4.17	4	7.168
	WL Warangal	0	1.692	4	3.087
	Karimnagar (E)	0	4.895	11	8.025
	Karimnagar (W)	0	3.6	11	7.09822
	Circle total	0	18.427	42	33.31386
FDPT	Achampet	7	8.4	6	8.221
	Circle total	7	8.4	6	8.221
WLM Hyd	CNP	0	1.14	1	1.087
	D.F.O	0	1.14	1	0.682
	Circle total	0	2.28	2	1.769
I&TC	I&TC	0	588.35	4	139.73725
	Circle total	0	588.35	4	139.74
GRAND TOTAL		77	696.072	158	301.688

2.2.8 Monitoring and Evaluation (M&E): CAMPA is being implemented in the state since 2009 and there is a need to monitor the implementation of the programme in the field level besides the

regular supervision by the Forest Range Officers/ DFOs /Circle heads and Senior Officers from the Head Office. Besides monitoring, the performance of the initiatives in achieving the objectives of CAMPA through Evaluation by the third party is proposed in 2012-13 for effective implementation of CAMPA scheme. The CAMPA guidelines also prescribe utilization of 2% of the Annual outlay for Monitoring and Evaluation component in the APO. An amount of 19.38017 lakhs has been spent. Division wise targets and achievements under M&E for the year 2012-2013 is shown in Table 2.10. Major monitoring and evaluation activities during 2012-2013 include:

- Forest resources management monitoring and evaluation 3 numbers.
- CA and audit fees for auditing 4 numbers of works.
- Two support for monitoring and evaluation works.

Table 2.2.8: Division wise physical works (numbers) and expenditure (lakhs) abstract of M&E under TSFD, CAMPA for the year 2012-2013.

Circle	Divisions	Target		Achievements	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
Adilabad	Adilabad	3	0.99	1	0.236
	Nirmal	3	5.86	1	0.178
	WL Jannaram	2	0.5	3	0.475
	Mancherial	2	0.48	2	0.475
	Bellampally	2	0.38	1	0.375
	Kazagnagar	2	0.38	1	0.374
	Circle total	14	8.59	9	2.113
Hyderabad	Hyderabad	5	8.189	3	4.216
	Mahabubnagar	0	0.5	2	0.5
	Nalgonda	0	0	1	0.419
	Circle total	5	8.689	6	5.135
Khammam	Khammam	0	0	1	0.25778
	Kothagudam	0	0	1	0.264
	Paloncha	0	0	1	0.34083
	Bhadrachalam (N)	0	0	1	0.50281
	Bhadrachalam (S)	0	5.963	2	2.68
	WL Paloncha	0	0	1	0.16854
	Circle total	0	5.963	7	4.21396
Nizamabad	Nizamabad	3	0.875	1	0.6724
	Kamareddy	0	0	0	-0.26
	Medak	0	0	1	0.55967
	WL Medak	0	0	1	0.4
	Circle total	3	0.875	3	1.37207
Warangal	Warangal (N)	3	6.363	7	1.64883
	Warangal (S)	2	0.419	1	0.41952
	WL Warangal	2	0.419	1	0.33768
	Karimnagar (E)	2	0.375	1	0.12768
	Karimnagar (W)	2	0.375	2	0.375
	Circle total	11	7.951	14	2.90871
FDPT	Achampet	0	6.2	2	0.183
	Circle total	0	6.2	2	0.183
WLM Hyd	CNP	0	0.64	1	0.47752
	D.F.O	0	0.415	3	0.5631
	Circle total	0	1.055	4	1.04062
R&D	SS Hyd	0	0.75	1	0.73753
	FG WGL	0	0.25	0	0
	Circle total	0	1	1	0.73753
Zoo Park	Zoo Park	0	1.685	2	1.67628
GRAND TOTAL		33	42.008	46	19.38017

2.2.9 Office Support (OS): Office support activities were undertaken for effective and proper maintenance of offices and implementation of various schemes. Contractual technical and other staff for office support, POL Charges, AMC charges, Electricity and water charges, Telephone and

cell phone charges, Office stationery and other miscellaneous expense, CA audit fee are included under OC by Telangana state. An amount of 0.225 lakhs has been spent under this component. Division wise targets and achievements under O&S for the year 2012-2013 is shown in Table 2.2.9.

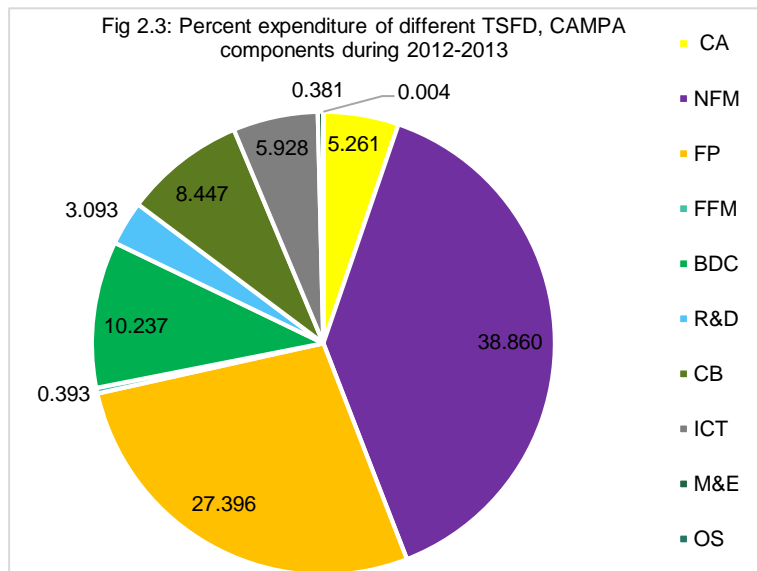
- Office support (POL, Telephones & communication charges, Office Stationery etc)
- Water and electricity charges

Table 2.2.9: Division wise physical works (numbers) and expenditure (lakhs) abstract of OS under TSFD, CAMPA for the year 2012-2013.

Name of the Circle	Name of the Division	Office Support			
		Sanctioned Cost		Expenditure	
		Physical (nos)	Financial (lakhs)	Physical (nos)	Financial (lakhs)
Nizamabad	Kamareddy	-	-	1	0.225
AO IV	AO IV	-	93.02639	-	0
Grand total			93.02639	1	0.225

2.3 Targets and Achievements of CAMPA components during 2012-2013:

The Government of India, Ministry of Environment and Forests communicated guidelines that prescribe the preparation of an annual plan of operations for utilizing funds received towards Compensatory Afforestation, Net Present Value etc., currently available with the Ad-hoc CAMPA. Accordingly, keeping in view the GOI guidelines, an Annual Plan of Operation (APO) for utilization of amounts realized under Compensatory Afforestation (CA) and Net Present Value (NPV) have been prepared by the TSFD for the



year 2012-13 under A.P. State CAMPA, as Telangana state was a part of AP state in 2012-2013. Component wise detail target and achievements are shown in table 2.3. Percent expenditure of funds under different components are shown in Figure 2.3.

The target through Annual Plan of Operation was prepared to keep in view the following broad objectives:

- (a) Compensatory Afforestation in lieu of diverted forest areas,
- (b) Conservation, protection, regeneration, and management of existing natural forests,
- (c) Biodiversity Conservation and management of Protected forest areas and wildlife habitats, and

(d) Research, training and capacity building.

Table 2.3: Summary of targets and achievements of TSFD, CAMPA components during 2012-2013.

CAMPA Components	Targets		Achievements	
	Physical (nos)	Financial (lakhs)	Physical (Nos)	Financial (lakhs)
Compensatory Afforestation (CA)	288	279.6522	288	267.747
Natural Forest Management (NFM)	1278	2218.154	1278	1977.675
Forest Protection (FP)	349	1234.217	667	1394.223
Forest Fire Management (FFM)	52	12.071	69	20.0025
Biodiversity Conservation and Development (BDC)	297	611.199	599	530.3381
Research & Development (R&D)	326	159.6	326	157.4227
Capacity Building (CB)	57	554.26	94	429.8903
Information & Communication Technology (ICT)	77	696.072	158	301.688
Monitoring & Evaluation (M&E)	33	42.286	46	19.38017
Office Support (OS)	-	93.02639	10	0.225
TOTAL	2757	5900.538	3535	5089.214

2.4 Implementing mechanism: The Telangana State Forest Department was the implementing agency. The works were executed through the departmental personnel. In activities like nursery raising, raising of plantations, maintenance of plantations, Soil and Moisture Conservation works, creation and maintenance of fire lines and other activities with wage component, the programme was implemented following the guidelines of NREGA scheme by employing the rural unemployed people with job cards, maintenance of muster rolls and payment of wages into the bank account of job card holders.⁷

⁷AP State CAMPA, APO for the year 2012-2013, pp 9.

Chapter 3

EVALUATION SCOPE AND OBJECTIVES

As Telangana State Forest Department (TSFD) is implementing CAMPA activities in the state of Telangana since 2009-2010, there is a felt need to technically evaluate these ongoing efforts, and based on the learnings, plan the way forward. Also, the State CAMPA guidelines stipulate that an evaluation methodology of the works implemented has to be evolved and implemented to ensure effective and proper utilization of the fund for which funds are also earmarked. In this regard, IORA Ecological Solutions Pvt. Ltd. is engaged as the 'Third party' to evaluate and monitor CAMPA works implemented in the State of Telangana yearly for the period 2009-10 to 2015-16. Evaluation of activities under all the CAMPA components was conducted. Two-stage random sampling strategy has been adopted.⁸ Of all the activities, firstly 10% of works for each year were randomly sampled. For plantations activities, the basis for selecting 10% of the samples is adhering the National Evaluation Manual for CAMPA Projects when the survival percentage for different plantation sites is not available. Secondly, from the selected plantation sites, randomly a plot of 0.1 ha was laid for field enumeration adhering NWPC-2014⁹ guidelines. For other activities, works carried out were randomly sampled and 10% of the activities were selected every year. Records maintained for the activities was checked and in the case where civil or other physical works were carried out, the inspection was conducted during the evaluation process to check from variation as reported in the records and that exists on the field. It was ensured that the random sample covers maximum forest divisions of the state.

3.1 Evaluation scope

IORA Ecological Solutions Pvt. Ltd. has been assigned to conduct 3rd party evaluation of CAMPA works implemented in the State of Telangana.

3.2 Objectives of the study

1. To physically monitor and document the status of plantations of the selected sample from the plantation carried out under the CAMPA Scheme in Telangana State Forest department for the year 2012-2013.
2. To evaluate the survival and health of plantations carried out under the CAMPA Scheme in Telangana State Forest department for the year 2012-2013 with photographic evidence.
3. To evaluate the other activities carried out by Telangana State Forest Department for the year 2012-2013 with photographic evidence.

⁸National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

⁹National Working Plan Code – For Sustainable Management of Forests & Biodiversity in India (2014), MoEFCC, 91p.

Chapter 4

EVALUATION APPROACH AND METHODS

4.1 Evaluation Methodology

The process flow that was adopted during the third party CAMPA evaluation exercise is shown through a flowchart in Fig 4.1. The evaluation methodology was conducted in five stages. Each of these stages is elaborated in this chapter under five sub-sections.

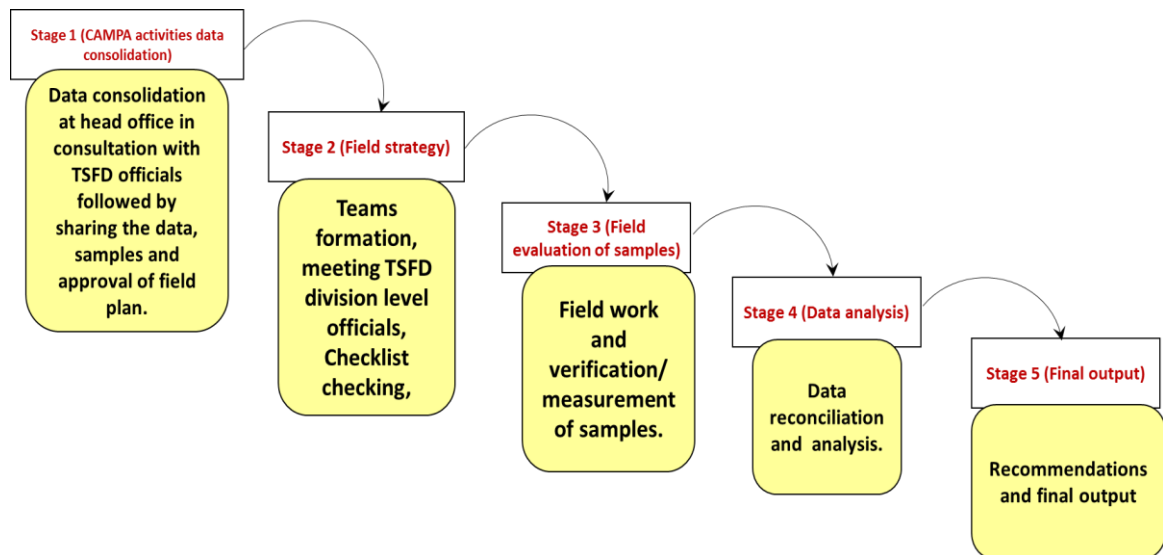


Fig 4.1: Process flow of third party CAMPA evaluation.

4.1.1 Stage 1 - CAMPA activities data consolidation: The first stage i.e. CAMPA Activities Data Consolidation (see Fig 4.1.1) consisted of four major activities namely data collection, sampling, field planning and issuance of field visit permission from APCCF (CAMPA).

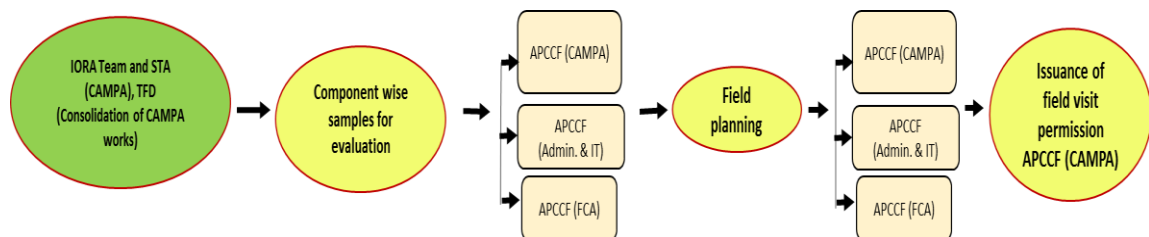


Fig 4.1.1: Flow chart of Stage 1 - CAMPA activities data consolidation.

TSFD officials were contacted at the TSFD, Head Office, Hyderabad to collect the total list of works under different CAMPA components undertaken by TSFD CAMPA for the year 2012-2013. The list of data sources reviewed for consolidation of CAMPA list of works for 2012-2013 is shown in List 4.1.1.

List 4.1.1: List of data sources for third-party CAMPA evaluation.

- (A) TSFD Data sources (files, excels) reviewed with support from STATE CAMPA
- 1) TSFD circles, divisions together with AP order
 - 2) TSFD circles, divisions before bifurcation list
 - 3) TSFD circles, divisions after reconciliation list
 - 4) CAMPA Annual Plan report 2012-2013
 - 5) List of works 2012-2013 excel
- (B) Information on GIS with support from DCF (FCA) and RFO (Geomatics)
- 1) List of divisions
 - 2) List of ranges

4.1.1.1 Component wise samples for evaluation: The consolidated list of CAMPA works under different CAMPA components undertaken by TSFD, CAMPA for the year 2012-2013 was collected. A total of 3535 works (*Part B*) were undertaken in the state of Telangana under CAMPA during 2012-2013. The total list of CAMPA works was sorted into two categories i.e. Plantation Activities and Other Activities. The list of samples prepared was presented to the CAMPA Monitoring Committee (CMC) consisting of the APCCF (CAMPA), APCCF (Admin & IT) and APCCF (FCA) through an inception workshop. Suggestions received from the CMC during the inception workshop was incorporated and the final inception report submitted to TSFD for approval. Detail sampling design adopted is described under the following two sub-sections.

4.1.1.1.1 Sampling of plantation activities: For direct field evaluation of plantation, the two-stage random sampling strategy was applied.

The list of plantation activities namely advance works, raising of forest plantations, maintenance of plantations and raising of planting stocks undertaken under CA and NPV was sorted for the year 2012-2013. The sorted list was then ably formatted using MS Excel software and the file was converted to a comma separated values (CSV) to plot them into the geo-spatial domain. The CSV values were plotted geo-spatially in ArcGIS Version 10.3 software and segregated into plantations undertaken under CA and NFM. Sampling design tool, an add-on of ArcGIS 10.3 software was run to generate random samples keeping sampling intensity of 10%.

Of all the total plantation taken up by TSFD, firstly 10% of plantations were randomly sampled. The basis for selecting 10% of the sample is adhering the National Evaluation Manual for CAMPA Projects when the survival percentage for different plantation sites is not available¹⁰.

Secondly, an iterative method was used to get the appropriate distribution of samples in the divisions. Telangana forest division boundary was taken as a sample frame to decide the extent of samples. From the selected plantation sites, a random point was generated to lay plot for direct

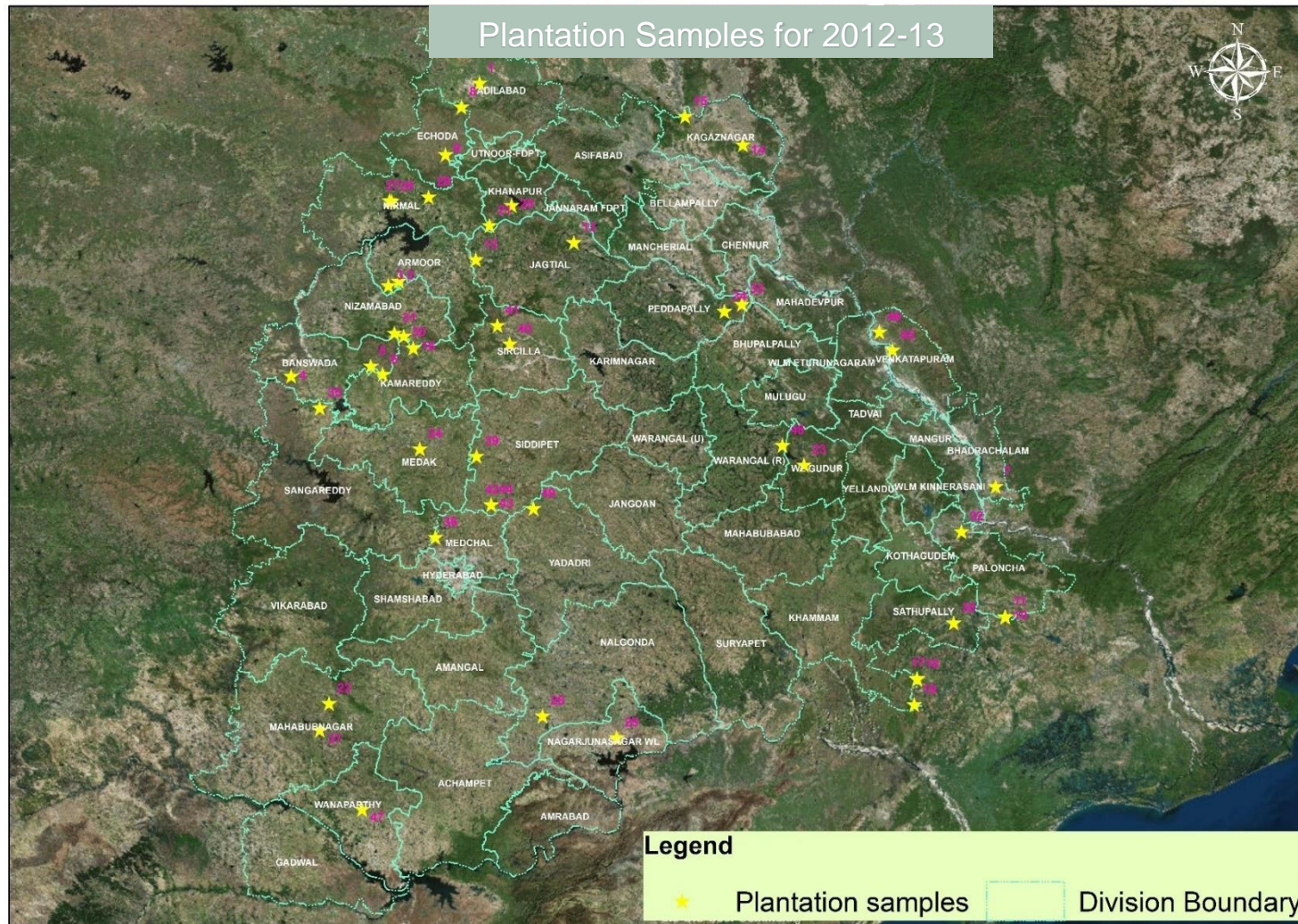
¹⁰National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

field enumeration adhering NWPC-2014 guidelines. The detail sample list (121 nos) of plantation activities is given in Annexure IV. Division wise number of plantation samples for evaluation under CA and NPV is shown in table 4.1.1a and Map 4.1.1.

Table 4.1.1a: Division wise number of plantation samples for different CAMPA components (2012-2013) for 3rd party evaluation.

Forest Divisions	Advance Operation		Raising		Maintenance		Nursery		Total
	CA	NFM	CA	NFM	CA	NFM	CA	NFM	
Achampet	-	1			1	-	-	-	2
Adilabad	-	1		1	-	-	-	1	3
Armoor	-	1	2		-	-	-	-	3
Boath	-	1			-	-	-	-	1
Banswada	-	1	1	2	-	-	-	-	4
Bellampally	-	-	-	-	-	2	-	-	2
Bhupalpally	-	1			-	-	-	-	1
Bhadrachalam (N)	-	-	-	1	-		-	2	3
Chennur	-	-	-		-	1	-	-	1
Echoda	-	2	-	2	-	-	-	1	5
Warangal (U)	-	-	-	2	-	-	-	-	2
Jagitial	-	-	1	1	-	-	-	1	3
Kaghaznagar	-	1	1	1	-	-	-	-	3
Kamareddy	-	-	-	1	1	-	-	-	2
Khammam	-	-	-	3	-	-	-	-	3
Khanapur	-	1	-	2	-	2	-	-	5
Mancherial	-	3	-		-	-	-	2	5
Mahabubnagar	-	2	-	1	-	1	-	-	4
Medchal	-	-	-		-	1	-	-	1
Mahbubabad	-	2	-	1	-	-	-	-	3
Medak	-	-	-	1	-	1	-	-	2
Nagarujan Sagar WLM	-	-	1		-	-	-	-	1
Nalgonda	-	1	1		1	-	1	2	6
Nirmal	-	-	-	3	-	-	-	1	4
Nizamabad	-	1	-	2	-	-	-	-	3
Paloncha	-	-	-	1	-	-	-	-	1
Peddapally	-	2	-	2	1	-	-	1	6
Rangareddy	-	1	-		-	-	-	-	1
Sangareddy	1	1	1	2	-	-	-	-	5
Sathupally	-	-	-	1	-	-	-	-	1
Siddipet	-	1	-	1	-	1	-	-	3
Sircilla	-	2	-	2	-	-	-	-	4
SS Hyderabad	-	3	-	3	-	2	-	-	8
Shamshabad	-	-	-	-	-	1	-	-	1
Utnoor	-	1	-	-	-	-	-	-	1
Venkatapuram	-	1	1	1	-	-	-	-	3
Vikarabad	-	2	-	-	1	-	-	-	3
Wanaparthy	1	-	-	1	-	1	-	2	5
Warangal Rural	-	2	-	1	-	-	-	-	3
Yadadri	-	1	-	1	-	1	-	-	3
Yellandu	-	-	-		1	-	-	-	1
TOTAL	2	36	9	40	2	16	1	13	121

Map 4.1.1a: Map showing plantation activities samples evaluated for 3rd party evaluation.

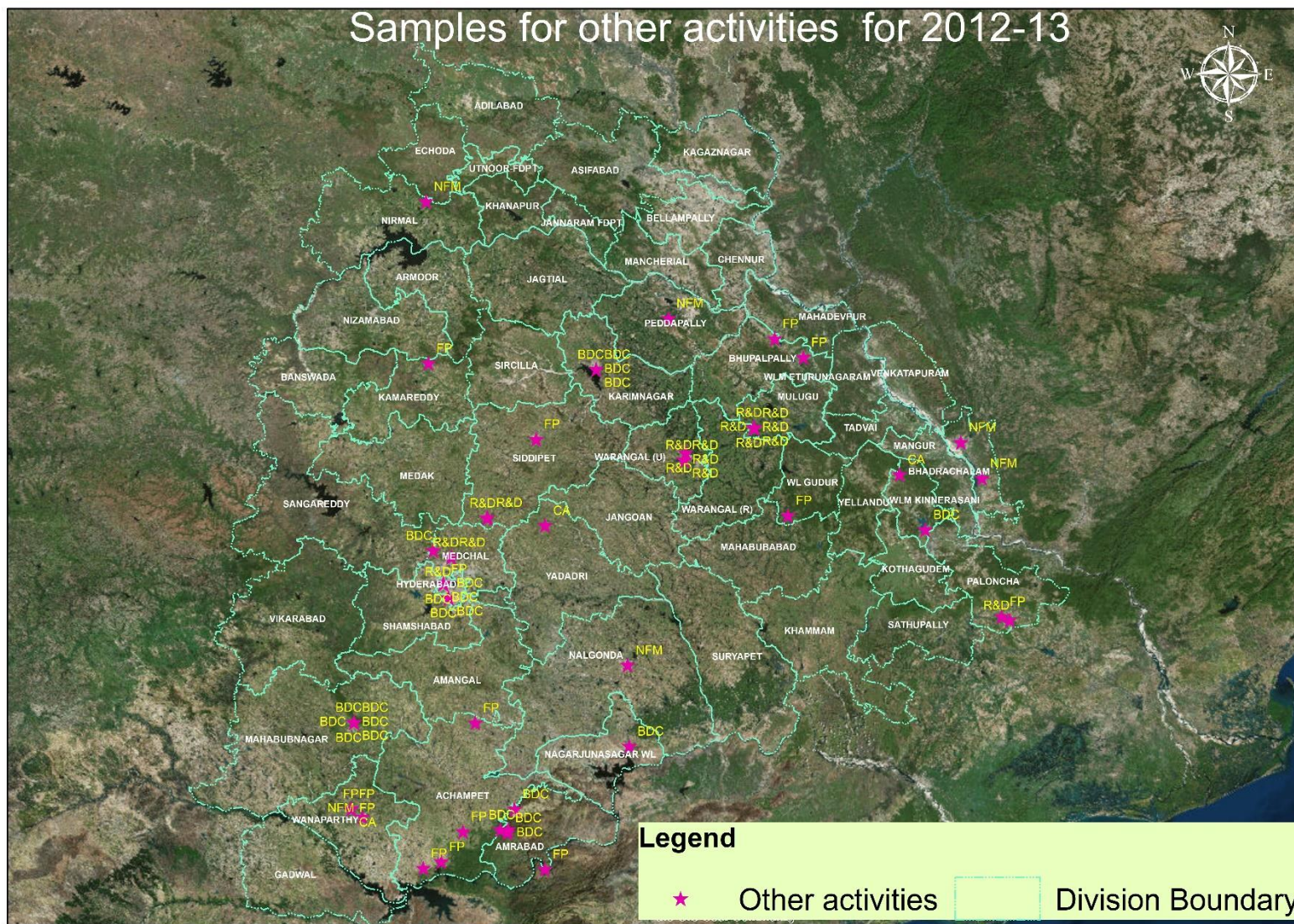


4.1.1.1.2 Sampling of other activities: For sampling other activities, the consolidated list of works of all the other activities undertaken by TSFD CAMPA during the year 2012-2013 was sorted. The sorted list was segregated into different CAMPA components. Sampling design tool, an add-on of ArcGIS 10.3 software was run to generate random samples keeping sampling intensity of 10%. An iterative method was used to get the appropriate distribution of samples in the divisions. The detail sample list (233 nos) of other activities is given in Annexure VI. Division wise number of samples of other activities under different CAMPA components namely, CA, NFM, FP, FFM, IDM, ICT, BDC, M&E, R&D, and OC is shown in table 4.1.1b and map 4.1.1.b.

Table 4.1.1b: Division wise number of samples for 3rd party evaluation of other activities under different CAMPA components for the year 2012-2013.

Division	CA	NFM	FP	FFM	BDC	ICT	R&D	CB	M&E	OS	Total
Achampet	-	-	9	-	-	2	-	-	1	-	12
Adilabad	1	3	4	-	-	-	-	-	-	-	8
Amrabad	-	-	3	1	10	-	-	-	-	-	14
Armoor	-	-	-	-	-	-	-	-	-	-	0
Asifabad	-	1	1	-	-	-	-	-	-	-	2
Banswada	-	-	-	-	1	-	-	-	-	-	1
Bellampally	1	1	-	-	-	-	-	-	-	-	2
Bhadrachalam	-	-	2	-	-	-	-	-	-	-	2
Bhupalpally	-	3	6	-	-	1	-	-	-	-	10
Echoda	-	1	7	-	-	-	-	-	-	-	8
FG Warangal	-	-	-	-	-	-	21	-	-	-	21
Hyderabad	-	1	-	-	-	-	-	-	-	-	1
ICT Hyderabad	-	-	-	-	-	2	-	-	-	-	2
Jagtial	-	1	1	-	-	-	-	-	-	-	2
Jannaram	-	-	1	-	15	-	-	-	3	1	20
Kaghaznagar	-	1	-	-	-	-	-	-	-	-	1
Kamareddy	-	-	1	-	-	-	-	-	-	-	1
Karimnagar East	-	-	-	-	1	1	-	-	-	-	2
Karimnagar West	-	-	1	-	-	-	-	-	-	-	1
KBR National park	-	-	1	-	2	-	-	-	-	-	3
Khammam	-	1	-	-	-	-	-	-	-	-	1
Khanapur	-	-	1	-	-	-	-	-	-	-	1
Kinnersani WLM	1	-	1	-	5	-	-	-	-	-	7
Mahabubnagar	-	1	-	-	12	-	-	-	-	-	13
Mahubabad	-	-	2	-	-	2	-	-	-	-	4
Mancherial	-	-	2	-	-	-	-	-	-	-	2
Manuguru	-	-	-	-	-	-	-	-	-	-	0
Medak	-	2	1	-	-	-	-	-	-	-	3
Nagarjunasagar WLM	2	-	-	1	6	1	-	-	-	-	10
Nalgonda	1	-	3	2	-	2	-	-	-	-	8
Nirmal	-	1	1	-	2	-	-	-	-	-	4
Nizamabad	-	2	-	-	-	-	-	-	-	-	2
NZP, Hyderabad	-	-	-	-	3	-	-	-	-	-	3
Paloncha	-	2	3	-	-	-	-	-	1	-	6
Peddapally	-	-	1	-	-	-	-	-	-	-	1
Rangareddy	-	-	-	-	-	-	-	-	-	-	0
Sangareddy	-	-	3	-	-	1	-	-	-	-	4
Sathupally	-	-	-	-	-	-	-	-	-	-	0
Siddipet	-	-	2	1	-	1	-	-	-	-	4
Sircilla	-	1	1	-	2	1	-	-	-	-	5
SS Hyderabad	-	-	-	-	-	-	11	9	-	-	20
TSFA, Dullapally	-	-	-	-	-	-	-	-	-	-	0
Utnoor	-	-	3	-	-	-	-	-	-	-	3
Venkatapuram	-	-	-	-	-	-	-	-	-	-	0
Vikarabad	-	-	2	1	-	-	-	-	-	-	3
Wanaparthy	4	1	1	1	-	2	-	-	-	-	9
Warangal Rural	-	2	-	-	-	-	-	-	-	-	2
Warangal Urban	-	-	-	-	-	-	-	-	-	-	0
WLM, Hyderabad	-	-	-	-	1	-	-	-	-	-	1
Yadadri Bhuvangiri	1	-	2	-	-	-	-	-	-	-	3
Yellandu	-	-	1	-	-	-	-	-	-	-	1
Grand Total	11	25	67	7	60	16	32	9	5	1	233

Map 4.1.1b: Map showing plantation activities samples evaluated for 3rd party evaluation.



4.1.1.3 Field plan: Proposed field visit dates was prepared in consultation with DFO, Hyderabad and shared with CMC for comments. Suggestions received were incorporated and the draft field plan was submitted to APCCF (CAMPA) for its approval. The division-wise details of field visits are given in Annexure I.

4.1.1.4 Issuance of field permission: Proposed field visit dates, records and other information to be furnished were circulated from the O/o PCCF & HoFF, TSFD to all DFO/FDO of the territorial and wildlife forest divisions of Telangana state (*Annexure II*). Field staff of the forest divisions to be visited were requested to be present during evaluation along with Measurement Book, Plantation Journal, CAMPA works register, and other information to facilitate smooth completion of the evaluation. As per the Rc.No.3037/2017/CAMPA dated 30.05.2017 issued by PCCF, TSFD the DFOs/FDOs (*Annexure III*) shall ensure concern field staff should be present and show the plantation site or other works taken up for CAMPA. The plantation journal, measurement books, estimate, list of works in Division/Range should be made available to the evaluation team.

4.1.2 Stage 2 - Field Strategy: In the second stage (*see Fig 4.1.2 for the flow chart*) of third-party field evaluation field strategy was developed. This stage started with the formation of evaluation teams, team visits to fifty-four forest divisions team visits.

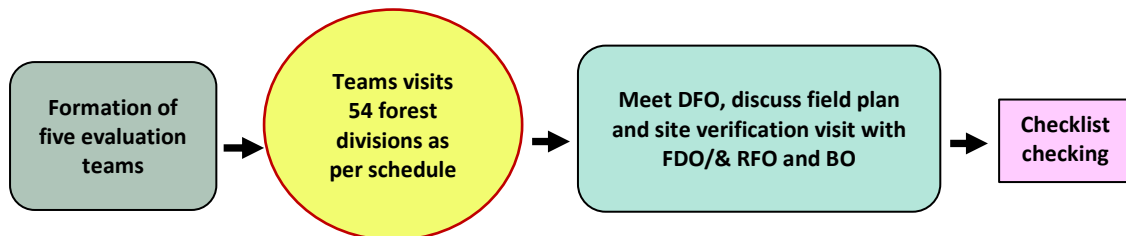


Fig 4.1.2: Flow chart of Stage 2 - Field strategy.

This stage started with the formation of five evaluation teams, each team comprising of Field lead, field associate, and back support analyst. Names and qualifications of the team members are shown in Annexure IV.

As per the field visit schedule, each team met DFO and discussed field plan with DFO, FDO, and RFO. The following checklist was checked: a) CAMPA Works Register, b) Confirmation of Samples, c) Plantation Sites, d) Measurement Books, e) Plantation Journals and f) Vouchers, were requested from the forest division/range visited for conducting site verification. Visit to the site was done with FDO/& RFO and BO.

4.1.3 Stage 3 - Field evaluation of samples: Field evaluation of samples was conducted by first checking CAMPA works register in the division to reconfirm plantation activities samples drawn under CA and NPV and after confirmation based on the geo coordinate the evaluation team visited the sites with the TSFD division level officials and data was collected adhering the forms (*Appendix I*).

4.1.3.1 Meeting TSFD officials

- 1) Met DFO followed by a meeting with FDO, RFO and FBOs in each division/ranges visited.
- 2) Collected list of works carried out under TSFD, CAMPA.
- 3) Matched each sample with the CAMPA works register list.
- 4) After confirmation ensured a forest department officials presence in each of the samples locations.
- 5) Physical verification and geotagging. This is elaborated under sub-section 4.2.

4.1.3.2 Build capacity: During field evaluation efforts was laid also to build the capacity of the front line TSFD officials present during evaluation on how to lay sample plots and use, hands-on different forest inventory instruments like GPS, compass, densitometer, Hypsometer.

4.1.4 Stage 4 - Data analysis: This stage consisted of activities (see Fig 4.1.4) pertaining to data digitization, data reconciliation, and data analysis data analysis.



Fig 4.1.4: Flow chart of Stage 4 – Data Analysis.

4.1.4.1 Data digitization: The primary activities conducted for digitizing the data are as follows:

- a) Allocation of a place at Aranya Bhavan.
- b) Data of plantation activities and other activities were digitized through MS Excel.
- c) Data consolidated at the division level.

4.1.4.2 Data reconciliation

- a) Reconciliation of the field data with the spending records.
- b) Verified works with audited reports and FA 9 for each CAMPA activities at Aranya Bhavan with support from STA CAMPA. The verified CAMPA works list as per the audited reports was used.
- c) Collation of Field data collated.

4.1.4.3 Data analysis: Data analysis as per the methodologies approved in the inception workshop using MS Excel. For the purpose of reporting, the survival percent was weighted by net area planted in the same model. The percentage was reported separately for plantation type, plantation method, protection status of the plantation and different species.

4.1.5 Stage 5 - Final output: The final stage of evaluation constituted tabulation of results and production of outputs (see fig 4.1.5).

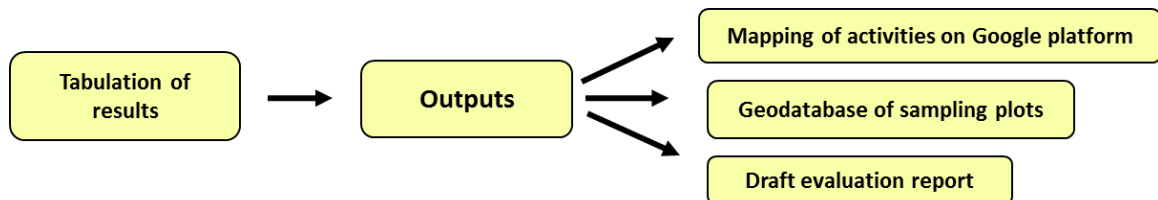


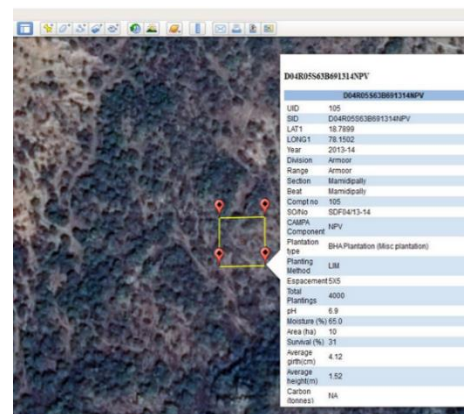
Fig 4.1.5: Flow chart of Stage 5 – Final output.

4.1.5.1 Tabulation of results

- a) Analyzed results were tabulated separately for divisions, species, plantation types, activities.
- b) Matched field data collected and data digitized.
- c) Field data digitization and consolidated at the division level for 2012-2013.

4.1.5.2 Outputs

a) Geodatabase created of all sampled plantation plots (file *CAMPA_2012_2013_field_plantation_samples.kmz*)



b) All activities mapped using Arc GIS and exported to Google earth platform (file *CAMPA other activities samples_2012-2013.kmz*)



c) Development of draft evaluation report.

4.2 Field evaluation and data collection

(A) Plantation activities:

1) Based on the measurement books (MB), where all the works executed and amounts paid written by officer executing the work, check measured by R.O. and test checked by DFO/Sub DFO or any other higher authority are maintained, physical verification of MB, collection of GPS coordinates from registers and other records available in the concerned forest offices followed by field visit to the project area for its field verification. For evaluation plantation (raising) samples, sample plots were laid. Evaluation of other plantation activities namely, advance operations including nursery works of planting stocks; maintenance (1st year, 2nd year and 3rd year) was based on scrutinization of information available on measurement books/plantation journals/expenditure vouchers since these type of plantation activities had completed at least a year before the evaluation team visited the field.

2) For laying sample plot, Garmin GPS used to navigate to reach the randomly generated sample geocoordinate. A square plot of 0.1 ha¹¹ (Fig 4.1.3.2) was laid out by measuring 22.5 m horizontal distance i.e., half of the diagonal in all the four directions at 45^o in north-east, at 135^o in the south-east, at 225^o in the south-west, and at 315^o in north-west corners of the plot from true north. The dimensions of the plot, i.e. one side measured 31.62 m horizontal distance. Latitude and longitude of all the sample plots of plantations are shown in Annexure VII.

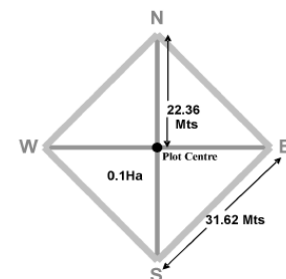


Fig 4.1.3.2: Sample plot layout.

3) After laying the sample plot, plots, the parameters evaluated is shown in table 4.1.3.2.a.
Table 4.1.3.2b: List of evaluation parameters for plantations.

Evaluation Parameters	Field Recordings to be made
Survival percentage	Plants surviving in the sample plot counted and recorded.
Growth of trees	Diameter and height of each tree inside the plots were recorded.
Habitat Improvement	Presence of wildlife, good growth of grasses, soil erosion, water sources if any observed recorded. Plantation watchman, officials, VSS members, if present were interviewed to record their qualitative perception of CAMPA plantations on habitat improvement.
Canopy density	Canopy density recorded using a densiometer. Number of plants wounded, stressed, wilt, diseased recorded.
Soil salinity and moisture status	Soil salinity and soil moisture estimated using a portable soil pH and soil moisture meter.
Carbon content of plantations	The carbon content of the plantations estimated based on allometric equations as given by Forest Survey of India. ¹²

¹¹National Working Plan Code — For Sustainable Management of Forests & Biodiversity in India (2014), MoEFCC, 91p.

¹²FSI (2015) Carbon Stocks in India's Forest, 164p

- 4) For assessing mortality, every tree growing inside the plot were counted. Diameter for every tree growing inside the plot was measured 50 cm above the ground level for up to 3 years old plantation and 100 cm above ground level for up to 5 years plantations as mentioned in NEM CAMPA, 2016¹³ using a tape.
- 5) For calculating the carbon content trees with girth above 30cm was taken to apply the allometric equations as developed by FSI¹⁰ for calculating tree carbon. Accordingly, the carbon content per tree was calculated.
- 6) Data observed were recorded in Form B (Appendix I). Evaluated samples detail of plantation activities is shown in Annexure V.

(B) Other activities:

- 7) For evaluation of other activities, from a total of the activities under each component, 10% of activity were randomly selected. Activities that were physically visible like RCC pillars, beat office, quarters, etc. field evaluation on work status was conducted and geotagged pictures were taken. Evaluations of samples of other activities like fuel charges, POL charges, payments, etc. were based on the information made available through measurement books / CAMPA register/vouchers / FA 9, since the activities had been completed five years before the field evaluation visited the sites.
- 8) Field observations were recorded in different forms namely Form A to Form L (*Appendix 1*). Form number with the activities information recorded during the field evaluation exercise is shown in table 4.1.3.2a.

Table 4.1.3.2a: List of Forms with the information of activities to be recorded during CAMPA field evaluation exercise.

S. No.	Form No.	Activities
1.	Form A	Summary
2.	Form B	Plantation Activities (CA / NFM)
3.	Form C	Soil & Water Conservation activities (CA-CAT, FWM, BDC)
4.	Form D	Forest Protection Activities
5.	Form E	Forest Fire Management Activities
6.	Form F	Biodiversity Conservation & Ecotourism Activities
7.	Form G	Infrastructure Development & Maintenance
8.	Form H	Research & Development
9.	Form I	Information & Communication technology Activities
10.	Form J	Capacity Building and Office Support Activities
11.	Form K	Monitoring & Evaluation Activities
12.	Form M	Third-party comments

The evaluated samples detail of other activities is shown in Annexure VI.

¹³National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

4.3 Evaluation scoring

(A) Quantitative aspects

Quantitative evaluation score for different plantation activities and other activities under different CAMPA components are elaborated below

i) Plantation activities:

a) For raising of plantations, scoring of each sample was carried out on a scale of 0 to 300. Scoring for evaluating the field plantation samples was based on mortality. Sample plantation plots with mortality less than 10% was scored 300 points, for mortality 11% to 20% = 240 points, 21% to 30% = 180 points, 31% to 40% = 120 points, 41% to 50% = 60 points and for mortality of plantations above 50% = 0 points was given.

b) For advance works and maintenance of plantations, scoring was done on a scale of 0 to 100 based on the percent variations. For deviations less than 10% = 100 points, 11% to 20% = 80 points, 21% to 30% = 60 points, 31% to 40% = 40 points, 41% to 50% = 20 points and for mortality above 50% = 0 points was assigned.

c) Total score allotted to plantation activity for the year is the average score of the total plantation activities evaluated.

ii) Other activities:

a) For recording Soil and Water Conservation, the scoring was done in a scale of 0 to 100. Scoring to evaluated works was based on the deviations observed in between the records and in the field. For deviations less than 10% = 100 points, 11% to 20% = 80 points, 21% to 30% = 60 points, 31% to 40% = 40 points, 41% to 50% = 20 points and for deviations above 50% = 0 points was given.

b) Other activities under NFM, FP, FFM, BDC, ICT, R&D, M&E and OS the scoring was done in a scale of 0 to 10. Scoring to evaluated works was based on the deviations observed in between the records and in the field. For deviations less than 10% = 10 points, 11% to 20% = 8 points, 21% to 30% = 6 points, 31% to 40% = 4 points, 41% to 50% = 2 points and for deviations above 50% = 0 points was given.

(B) Qualitative aspects

Qualitative evaluation scoring for different plantation and other activities carried out under TSFD CAMPA are elaborated below

a) Impact awareness generation campaign is based on any evidence during evaluation on conducting of regular CAMPA campaigns by the forest department.

- b) Identification of approved site for plantation were based on checking the availability of treatment plan on measurement books/ plantation journals.
- c) Improvement in quality of wildlife habitat are based on the impact of different plantation raised under CAMPA on the wildlife.
- d) CAMPA benefits was based on a number of persons from BPL/SC/ST communities engaged for CAMPA activities.
- e) Project awareness CAMPA is based on discussion with local people and forest officials about CAMPA.
- f) Transparency maintenance and payment was based on the availability of matching CAMPA works at the division and at the head office.
- g) Maintenance of assets created was based on the state of the physical assets created and plantations raised.

4.3.1 Evaluation scoring total: The total score of a component is the total of the average score of the points scored under each sub-component. The total score of evaluation was recorded in the overall site assessment sheet as shown in table 4.3.1 for the year evaluated.

Table 4.3.1: Overall site assessment sample sheet¹⁴.

Quantitative Aspects (A)				Qualitative Aspects (B)			
SNo.	Main Heading	Score	Total	SNo.	Main Heading	Sco	Total
I	Plantation Activities (Compensatory Afforestation and Natural Forest		500	I.	Impact of awareness Generation campaign		5
II	Soil and Water Conservation Measures		300	II.	Identification of approved Site for plantation		5
II	Forest Protection		100	III.	Improvement in quality of wildlife habitat		5
I	Forest Fire Management		10	IV.	CAMPA benefits		10
V.	Biodiversity Conservation and Development		100	V.	Project Awareness		5
VI	Research & Development		10	VI.	Transparency, maintenance And payments		5
VI	Capacity Building		10	VII.	Maintenance of assets Created		10
VII	Information Communication &		10				
IX	Office support		10				
X	Ecotourism		10				
Total (A)			1060	Total (B)			45
GRAND TOTAL (A+B)							1105

¹⁴ The total score assigned to the components were done as per the percentage expenditure under the various sub-components of CAMPA and their importance.

The total figure under each main heading of quantitative aspect in the above table is based on the number of sub-components under the components evaluated.

Percent of the total score obtained is used to rank the performance¹⁵ based on the following table.

Percent score	Performance
90 - 100	Highly satisfactory
80 - 90	Satisfactory
60 - 80	Moderately Satisfactory
40 - 60	Unsatisfactory
Below 40	Highly unsatisfactory

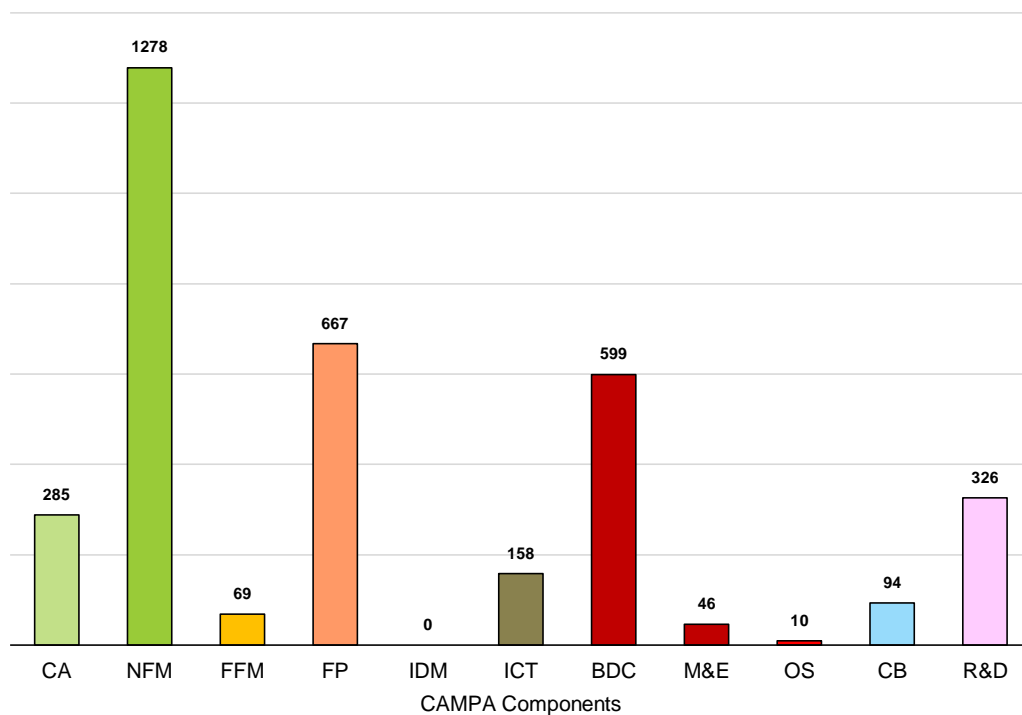
¹⁵National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

Chapter 5

DATA ANALYSIS

The total number of activities undertaken by TSFD under different CAMPA components during 2012-2013 is shown in Figure 5.0.

Fig 5.0: Total number of works under different TSFD CAMPA components year 2012-13



A total of 3535 works were undertaken in the state of Telangana during 2012-2013 under different CAMPA components. The highest number of works were undertaken under NFM followed by FP, BDC, R&D, CA, ICT, CB, FFM, M&E, and OS. Division wise details of total works are shown in table 5.0.

CA was undertaken by 18 divisions under 6 circles. The highest number of CA works was undertaken by Paloncha division. NFM activities were undertaken in 23 divisions under 7 circles, Medak undertook the highest number of NFM activities. FP works were carried out in 30 divisions of the state, among which Achampet had undertaken a maximum number of forest protection works. BDC works were undertaken by 15 divisions with Jannaram WL undertaking maximum number of BDC activities.

Table 5.0: Division wise total number of works under different components of CAMPA for the year 2012-2013 (division list as per before bifurcation).

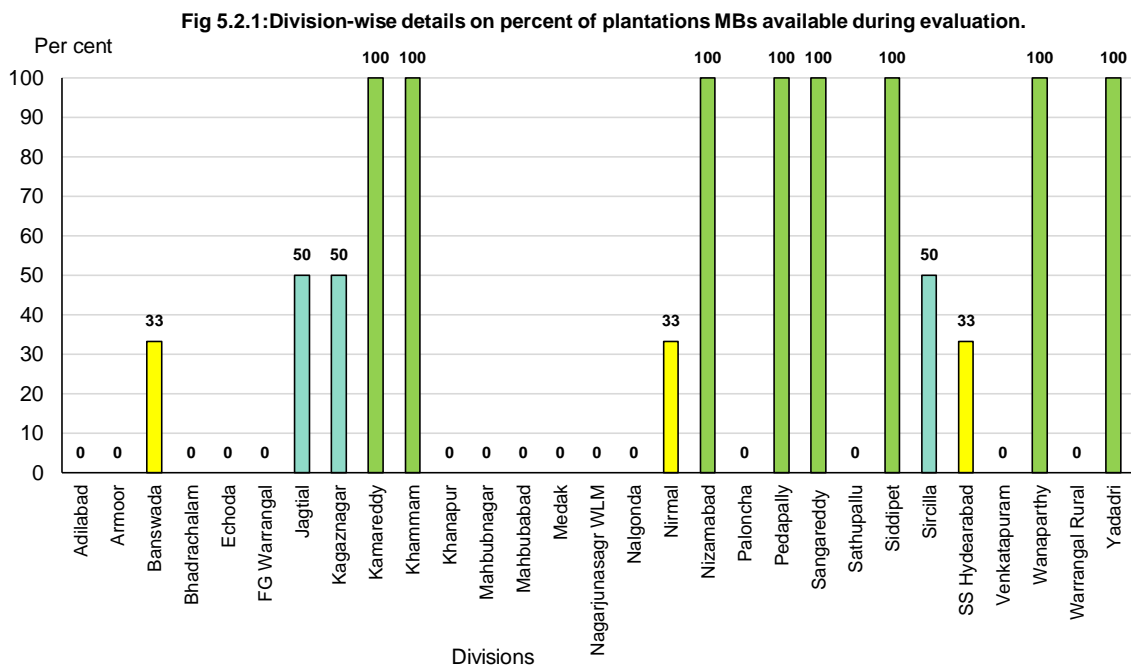
Circle	Division	CA	NFM	FP	FFM	BDC	ICT	M&E	R&D	CB	OS	Total Works
Adilabad	Adilabad	15	64	41	-	-	2	1	-	-	-	123
	Nirmal	1	63	45	-	36	7	1	-	-	-	153
	Jannaram WL	-	-	25	1	120	8	3	-	-	-	157
	Mancherial	9	73	19	-	-	5	2	-	-	-	108
	Bellampally	41	67	19	16	-	6	1	-	-	-	150
	Kag haznagar	-	64	19	-	-	7	1	-	-	-	91
Hyderabad	Hyderabad	1	72	28	19	11	5	3	-	-	-	139
	Mahabubnagar	43	52	10	6	28	5	3	-	-	-	147
	Nalgonda	33	29	10	3	-	3	2	-	-	-	80
Khammam	Khammam	4	51	41	-	-	10	1	-	-	-	107
	Kothagudem	9	50	48	-	-	8	3	-	-	-	118
	Paloncha	68	63	27	-	-	6	1	-	-	-	165
	Bhadrachalam (N)	7	54	24	-	-	-	-	-	-	-	85
	Bhadrachalam (S)	1	15	10	-	5	7	-	-	-	-	38
	WLM Paloncha	-	1	17	-	65	2	-	-	-	-	85
Nizamabad	Nizamabad	6	49	27	7	2	6	-	-	-	3	100
	Kamareddy	5	69	28	5	11	7	-	-	-	1	126
	Medak	17	209	19	6	1	8	2	-	-	-	262
	WLM Medak	-	-	5	1	57	2	1	-	-	-	66
Warangal	Warangal (N)	5	70	33	-	26	12	9	-	-	6	161
	Warangal (S)	-	41	23	-	-	4	2	-	-	-	70
	Warangal WLM	-	-	17	-	115	4	2	-	-	-	138
	Karimnagar (E)	2	65	20	-	-	11	1	-	-	-	99
	Karimnagar (W)	1	42	25	-	27	11	2	-	-	-	108
	FSP Warangal	-	-	2	-	-	-	-	-	-	-	2
FDPT	Achampet	8	6	58	1	29	6	-	-	-	-	108
	Nagarjunasagar	12	9	13	3	12	-	-	-	-	-	49
TSFA	APFA Dullapally	-	-	-	-	-	-	-	-	94	-	94
R & D Circle, Hyderabad	SS Hyderabad	-	-	-	-	-	-	-	155	-	-	155
	FG Warangal	-	-	-	-	-	-	-	171	-	-	171
WLM Hyderabad	CNP	-	-	3	1	29	1	1	-	-	-	35
	WLM Hyderabad	-	-	6	-	23	1	4	-	-	-	34
Director ZP Hyderabad	NZP Hyderabad	-	-	5	-	2	-	-	-	-	-	7
ICT Hyderabad	ICT Hyderabad	-	-	-	-	-	4	-	-	-	-	4
Total		288	1278	667	69	599	158	46	326	94	10	3535

5.1 Data Analysis of CAMPA Plantation activities: Data collected for plantation activities and other activities during field evaluation of the sample CAMPA activities for the year 2012-2013 were digitized, collated and checked as per the audited records available at the O/o PCCF, TSFD, Aranya Bhavan. Thereafter, the data was analyzed to understand the status, performance of

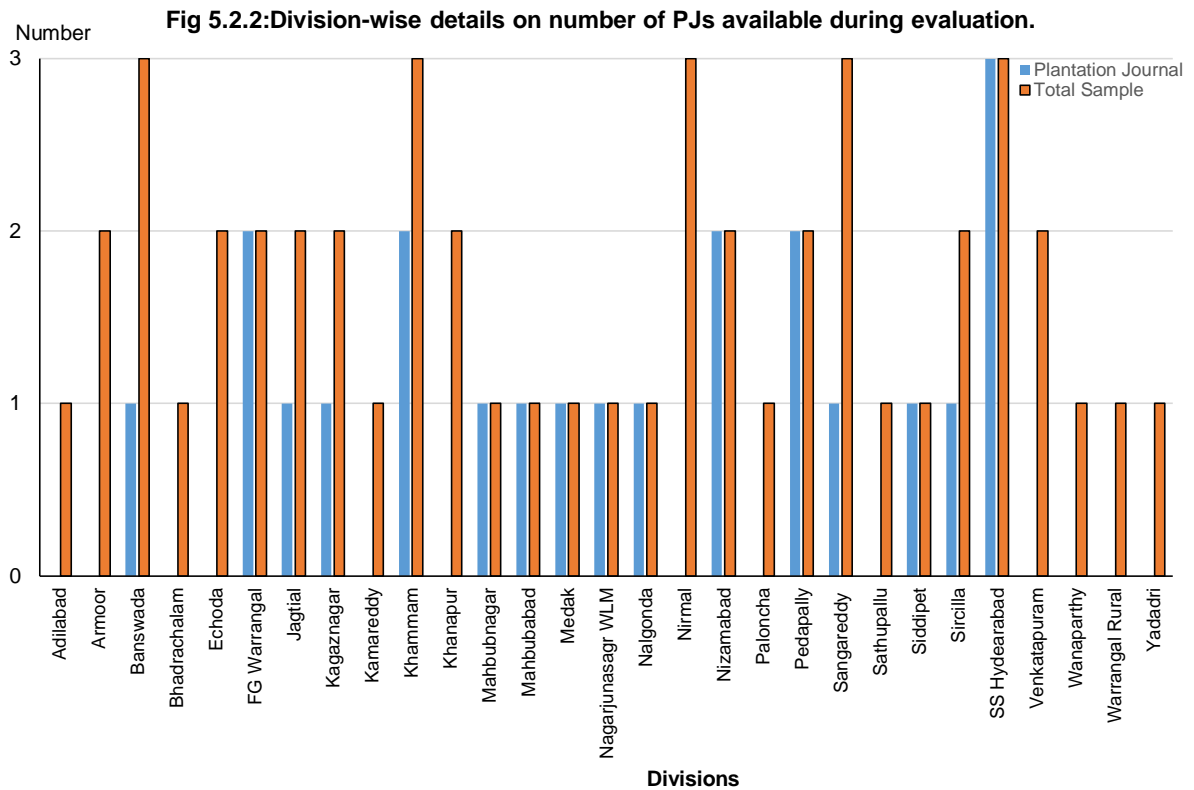
plantations, quantity and quality of other activities and any other critical issues on the CAMPA activities for the state of Telangana.

5.2 Maintenance of Records: Records were categorized as measurement books (estimates), plantation registers (treatment maps) and CAMPA schedule of works registers, vouchers, etc.

5.2.1 Measurement Books (MB): Section wise detail of works executed with estimates, amount disbursed, a period of works, is mentioned in MB. It has been observed that out of 49 plantations, only for 20 plantations MBs were made available. Fig 5.2.1 shows the percent of MBs available during evaluation.



5.2.2 Plantation journals (PJ): Plantation journals contains all the information of the site, plantation map, sanctioned order, soil characteristics and records of activities, monitoring and evaluation and any other information, all updated on the plantation. It has been observed that out of a total of 49 sample plantations, only 22 plantations had PJs. PJs of following plantations samples were not observed. Fig 5.2.2 shows the percent of PJs available during evaluation. Updated plantation journals section wise details on the area of plantation undertaken is mentioned.



5.2.3 CAMPA works register (CWR): CAMPA works register contains an index of work and summarized details of expenditure with the Schedule of Order. All the works entered in CWR are signed by the DFO. This information helps to authenticate whether works have been carried out. During field evaluation, it was observed that all the works were mentioned in the CWR.

Findings: Measurement Book (MB) could be examined for forty-one percent of the activities evaluated. Respective range level/ beat level officials during the evaluation time revealed that due to bifurcation of the Telangana state from erstwhile Andhra Pradesh and after further reconciliation of the divisions, documents have been kept at different places and therefore there were unable to produce during evaluation. It indicates that less attention is given to MBs which otherwise is a very important document. Irrespective of the situation MBs should always be kept with care in the range where plantation has been carried out. Further in all the available MBs for other activities, grid-wise details on volume of works undertaken is lacking. Lack of grid wise details makes it very difficult to quantify the works carried out. All the MBs that were made available during evaluation had the signature of RFOs indicating that RFOs have checked the works before making payments.

Plantation Journals (PJ) could be examined for only 45% of the plantations evaluated. Lack of PJ for the remaining 55% of plantations indicates that less attention is given on PJs which is one of the most important documents for any plantation activity. Irrespective of any situation PJs should always be kept with care in the range office where plantation has been carried out. Treatment plan

and grid wise details of plantations are available in the examined PJs. All the examined PJs had the signature of RFOs indicating that proper methods have been adopted for conducting plantations.

CAMPA works register (CWR) a record-keeping document was found in all the sites of evaluation. Works register hardcopy and softcopy were maintained at the division office. It contains an index of works based on Schedule of Order (SO) with the name of works/activity, site, and the summary of expenditure. All the activities entered in CWR was found to be signed by the DFO. The CWR maintained in the divisions and the final list of works as audited and maintained at the H/o does not totally tally.

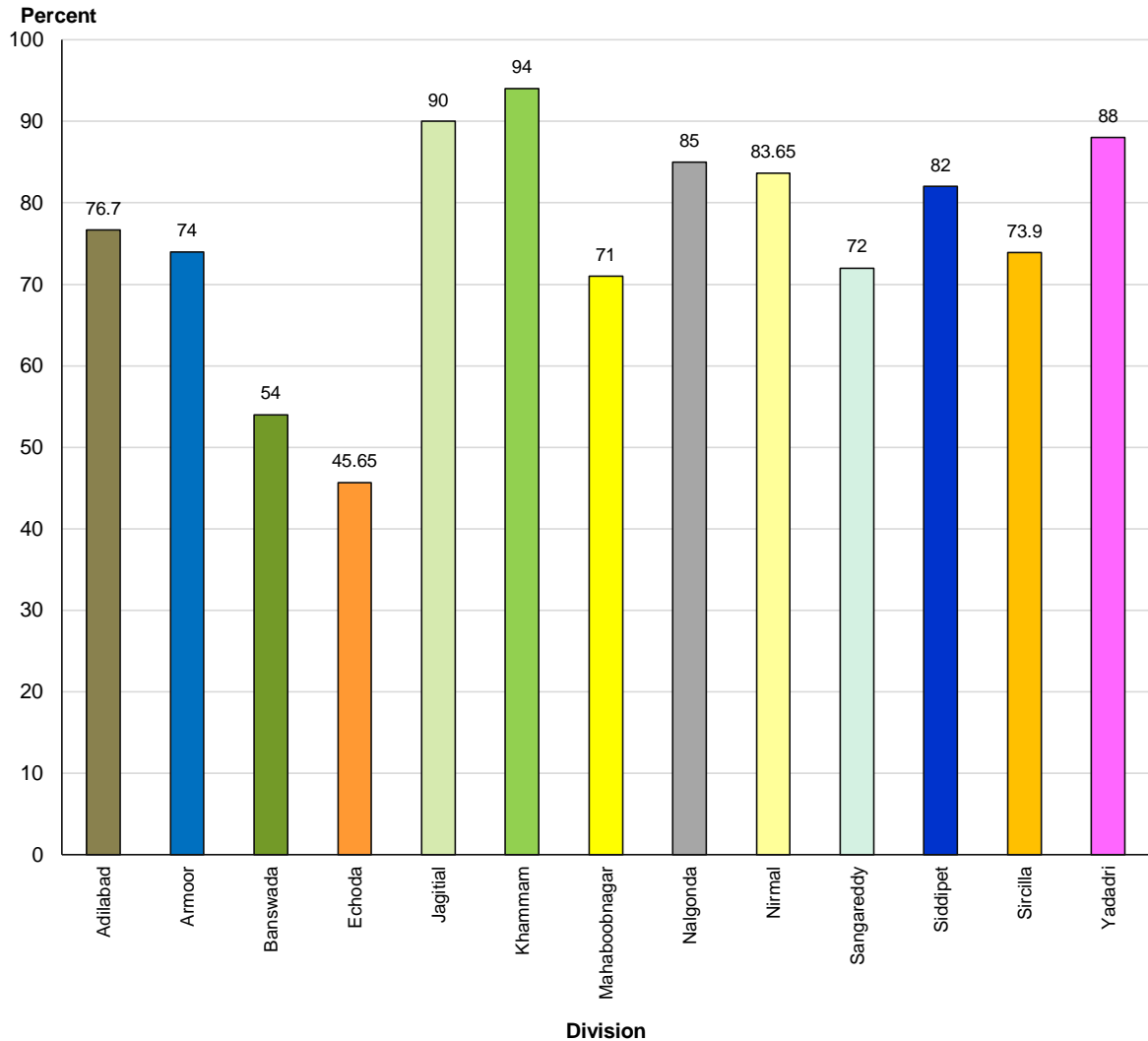
5.3 Survival percentage: Survival percentage of plantations is one of the vital parameter evaluated. It reflects the overall performance of plantations. Analysis of the survival percentage of the plantations was analyzed from different aspects namely methods of plantations, CAMPA components, species, divisions and existence of protections measures to get a clear understanding on the plantations.

5.3.1 Division wise plantation survival percentages: Division wise survival percentage of eucalyptus, NTHS and teak plantations is shown in fig 5.3.1 to Fig 5.3.7.

Eucalyptus plantation samples raised under 13 divisions were analyzed. Average survival percentage of eucalyptus raised under TSFD CAMPA across the divisions ranged from 45.65% to 94%. Comparison of survival of plantations across the divisions (*see Fig 5.3.1a*) revealed that Khammam had the highest survival percentage of eucalyptus followed by Jagitial, Yadadri,

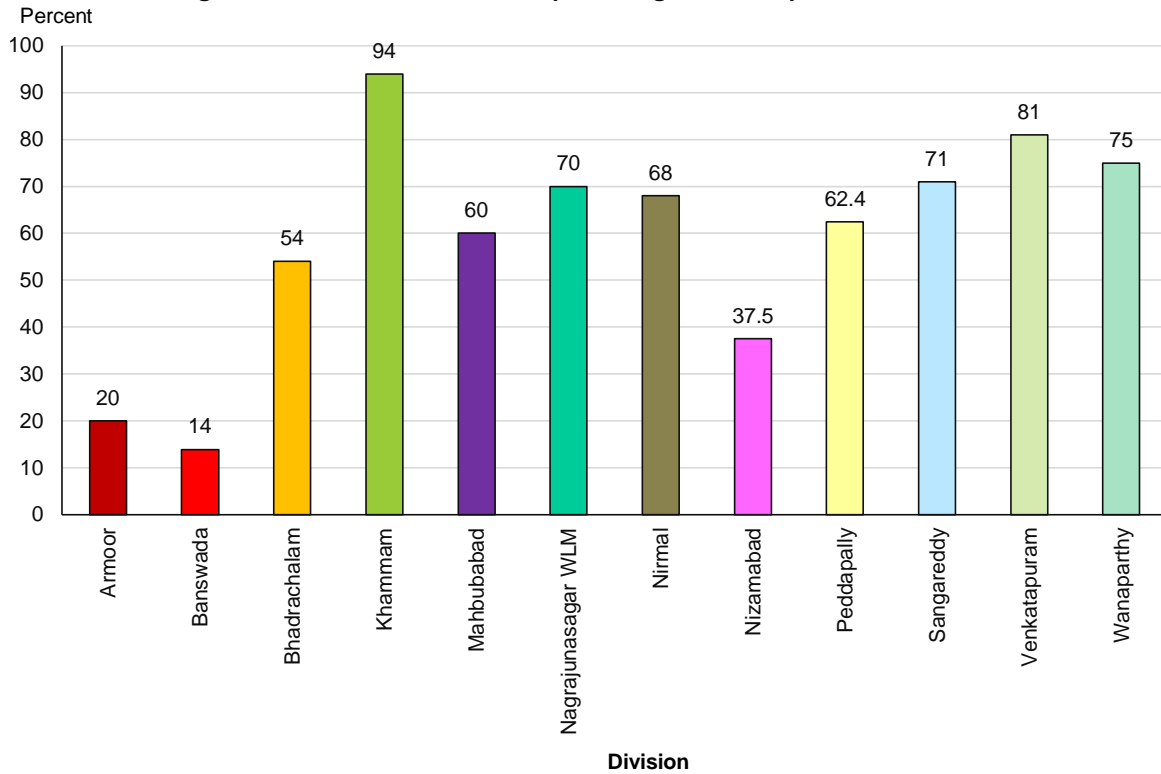
Nalgonda, Nirmal, Siddipet, Adilabad, Sircilla, Armoor, Sangareddy Mahbubnagar, and Banswada. Echoda reported the lowest survival percentage of eucalyptus.

Fig 5.3.1a: Division-wise survival percentage of Eucalyptus plantations.



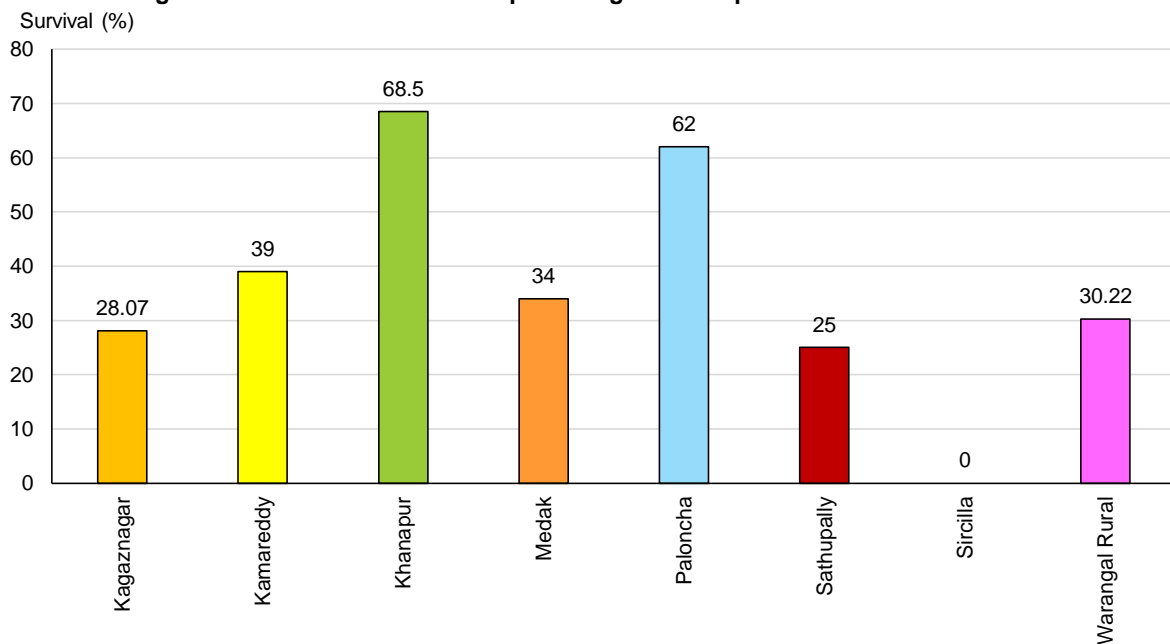
NTHS plantation samples under 12 divisions were analyzed. Average survival percentage of NTHS raised under TSFD CAMPA across the divisions ranged from 14% to 94%. Comparison of NTHS plantations survival across the divisions (see Fig 5.3.1b) revealed that Khammam had the highest survival percentage of NTHS followed by Venkatapuram, Wanaparthy, Sangareddy, Nagarjunasagar WLM, Nirmal, Peddapally, Mahbubnagar, and Bhadrachalam. Armoor and Banswada divisions reported the lowest survival of NTHS plantations raised under TSFA CAMPA during 2012-2013.

Fig 5.3.1b: Division-wise survival percentage of NTHS plantation in 2012-2013



Teak plantations samples were analyzed from 8 divisions. Average survival percentage of the teak plantations under TSFD CAMPA across the divisions ranged from total failure (0%) to 68.5%. Comparison of teak plantations survival across the divisions (see Fig 5.3.1c) revealed that

Fig 5.3.1c: Division-wise survival percentage of Teak plantation in 2012-2013.



Khanapur had the highest survival percentage of teak followed by Paloncha, Kamareddy, Medak, Warangal Rural, Kaghaznagar and Sathupally divisions. Teak plantation raised by TSFD CAMPA during 2012-2013 under Sircilla division failed.

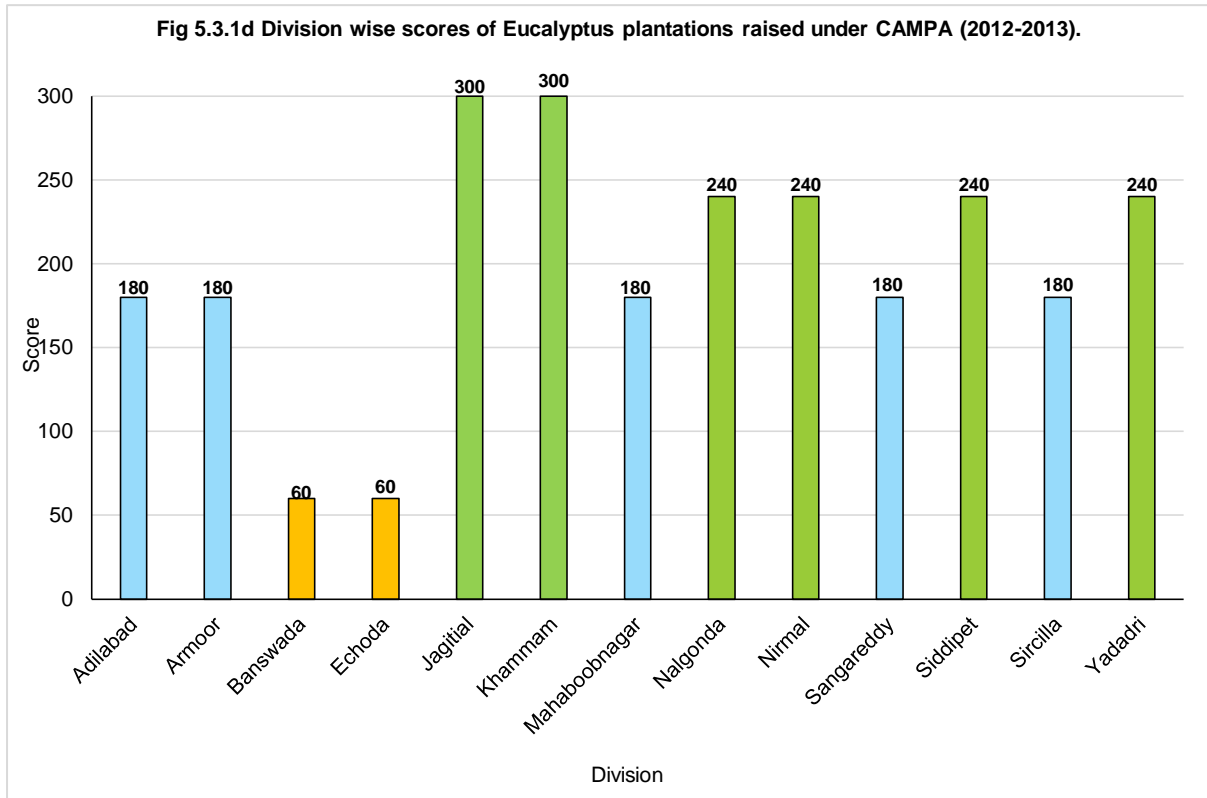
Findings: The plantations under TSFD CAMPA during 2012-2013 were raised under four different plantation types namely, Eucalyptus plantation, NTSH plantation, Teak plantations and Research Plots. Scoring was done as mentioned earlier on a scale of 300 based on the mortality of the plants during field evaluation. Among the different plantation types, Eucalyptus plantation raised with a spacing of 3m x 2m scored highest points. Not a single total failure of eucalyptus plantations raised during 2012-2013 under TSFD CAMPA was recorded during the evaluation. The average score of Eucalyptus obtained was 198.75 followed by NTSH plantation 116.67. Teak plantations scored 42 the lowest score. Plantations raised under research plots scored 108 scores.

Eucalyptus species, a high light demander is characterized by its ability to voraciously absorb water and nutrients to support its fast growth. This introduced species exhibited well in the areas planted, except in two divisions namely Banswada and Echoda, where its survival percentage is under 50% (see Fig.5.3.1d) Although there were signs of biotic interferences such as cut marks, loping, fire, in almost all the plantation, plantations of Banswada and Echoda exhibited very high biotic interferences. In plantations of Jagitial drying of poles in patches were observed. It was due to the existence of bedrock. The species as revealed by the local people is not preferred as firewood especially for cooking due to the presence of an aroma. This characteristic perhaps further helped this species to establish in the state. On the other hand, during evaluation, not a single nest of birds was recorded in the eucalyptus plantations reflecting that this plantation type is not preferred as a nesting habitat for birds. Only wild boar, peacocks and few common snakes were found moving in and out of the Eucalyptus plantations.

NTSH plantations performance was best recorded in Khammam. The plantations have insignificant biotic disturbances. The plantations exhibited comparatively the best growth in comparison to the NTSH plantations raised in other divisions.

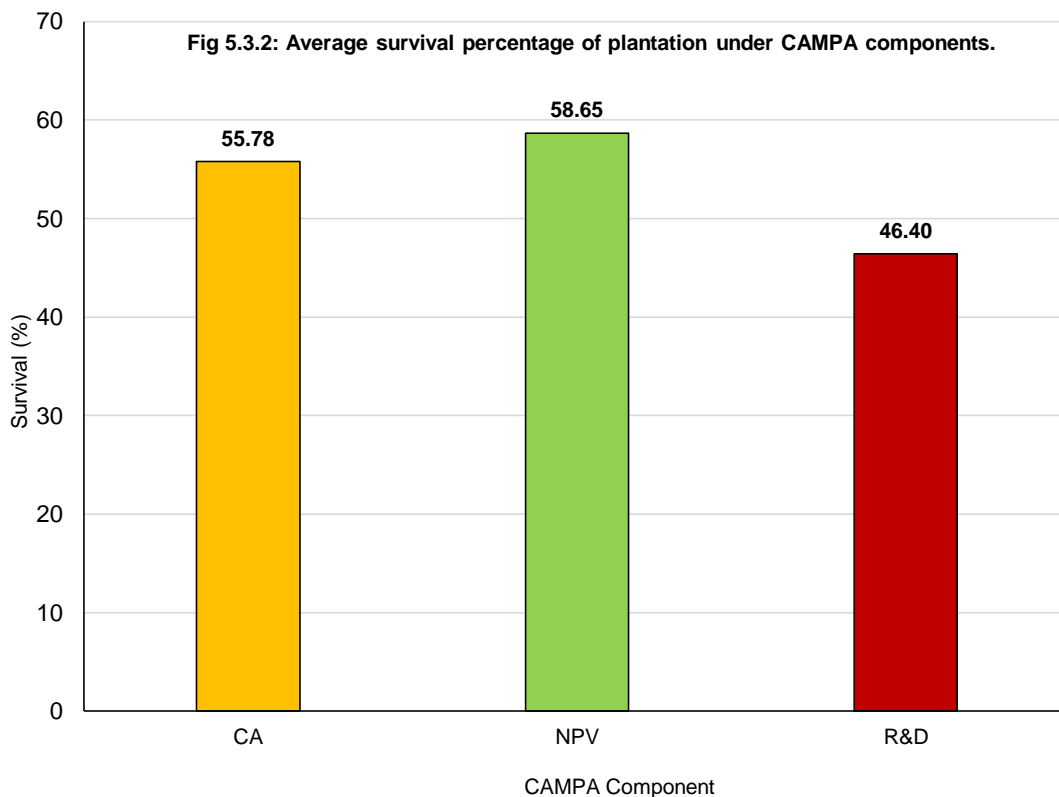
NTSH survival percentage was significantly low in areas exposed to repeated biotic interferences.

Information received during field visits revealed that heavy biotic pressure is one of the prime reason for less than forty percent survival of teak plantations in 75 % of the divisions that raised teak during 2012-2013 under TSFD CAMPA. Additionally, it was also learned through discussions



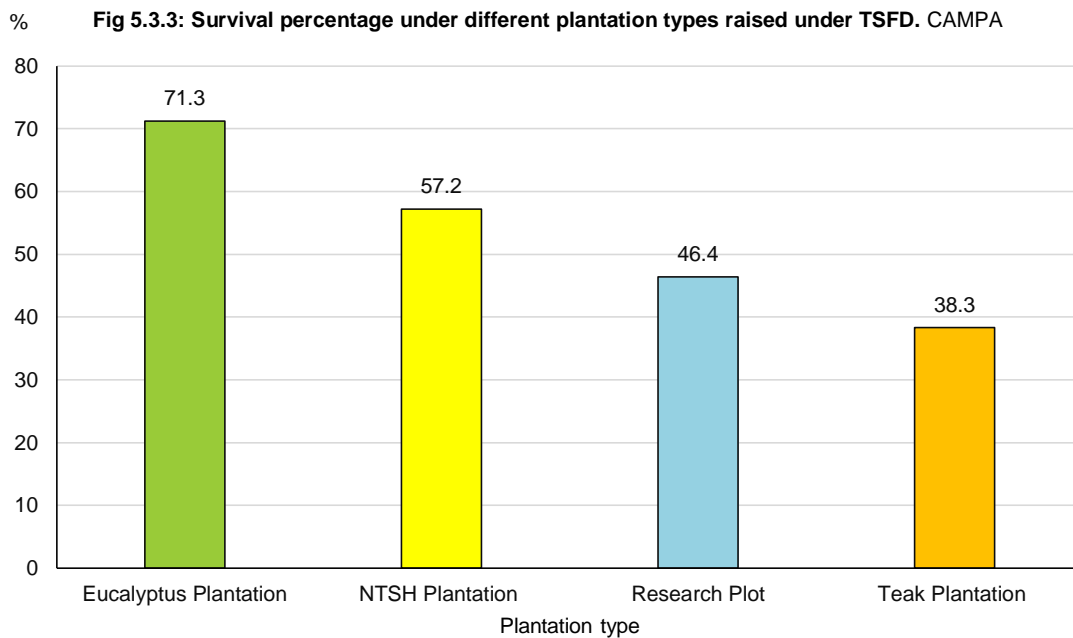
with forest officials, watchman, and other available local people during the evaluation that lack of rains after plantation of teak seedlings significantly reduce teak germination. Suitable soil, soil with good depth and ability to retain water is necessary for the survival of teak plants.

5.3.2 Survival percentage of plantations under different CAMPA components: Plantations activities was carried out under three CAMPA components namely CA, NFM and R&D in the state of Telangana during 2012-2013. Comparison of survival percentages of plantations raised under the different CAMPA components is shown in Fig 5.3.2. It shows that plantations raised under NFM exhibited the highest survival percentage (58.65%) followed by plantations raised under CA (55.78%). Survival percent of plantations raised under research & development was 46.40%.



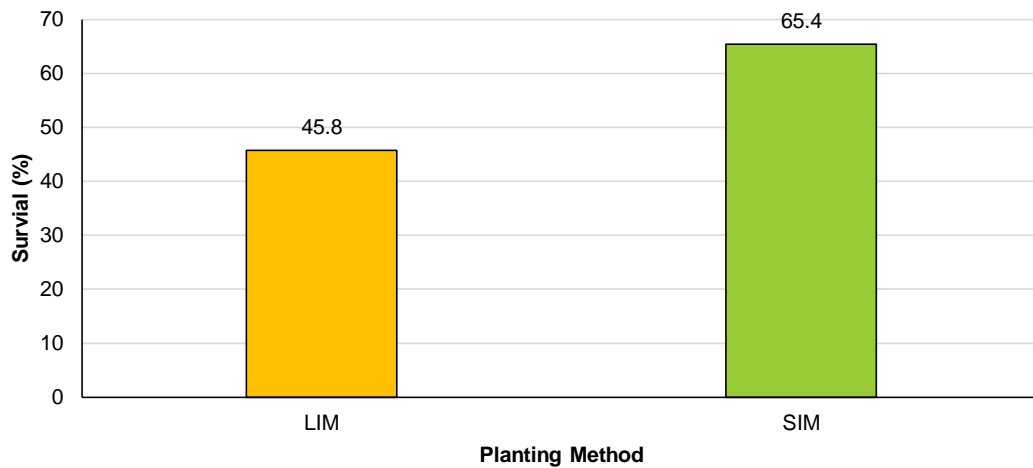
Findings: Analysis of field evaluation revealed that plantations raised under CA performed better than those raised under NFM. Performance of plantation raised under R&D was lowest when compared with those raised under CA and NFM. **Scores obtained by plantation raised under different CAMPA components namely CA, NFM, and R&D are 140, 126.86 and 108, respectively.**

5.3.3 Survival percentage of plantations raised under different plantation type: Survival percentage of under different plantation types raised by TSFD CAMPA during 2012-2013 is shown in figure 5.3.3. Four different plantation types were recorded, namely Eucalyptus plantation, NTSH plantation, plantations under research plots and teak plantations. Eucalyptus had the highest survival percentage followed by NTHS. Teak showed lowest survival percentage during evaluation. R&D plots had also reported lower survival percentage when compared to the other plantation types.



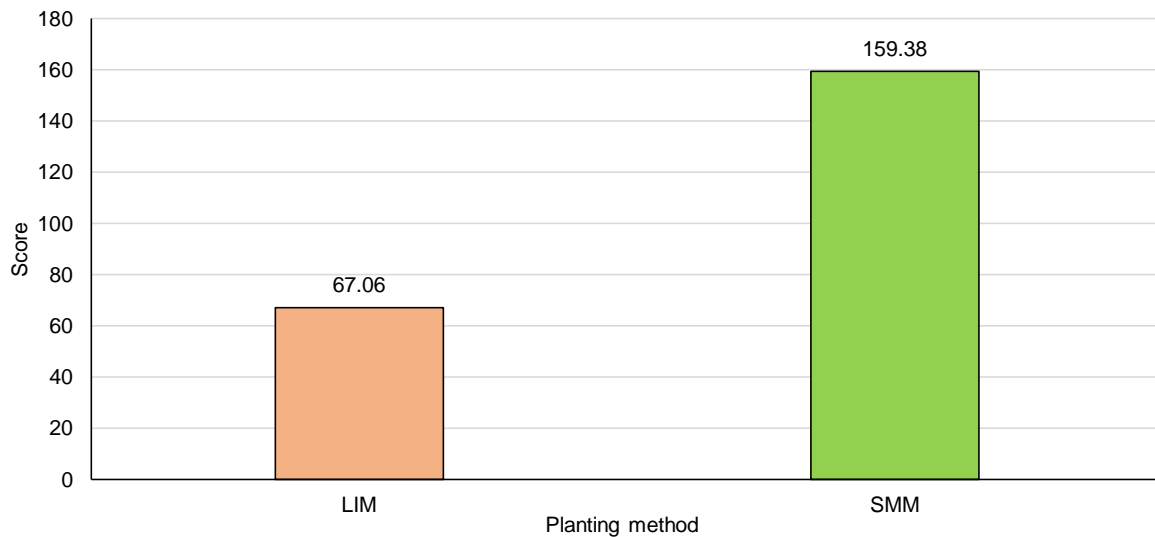
5.3.4 Survival percentage of plantations under different planting methods: Two planting methods namely Labour Intensive Management (LIM) and Semi Mechanical Method (SMM) was adopted for raising plantations under TSFD, CAMPA during 2012-2013. Graphical representation of the results of plantations under the different planting methods is shown in Fig 5.3.4. Survival of plantations was significantly higher (65.4%) under SMM method. Average survival percentage of plantations raised under LIM was found to be 45.8 percent.

Fig 5.3.4: Survival percentage of plantation under LIM & SMM in 2012-13



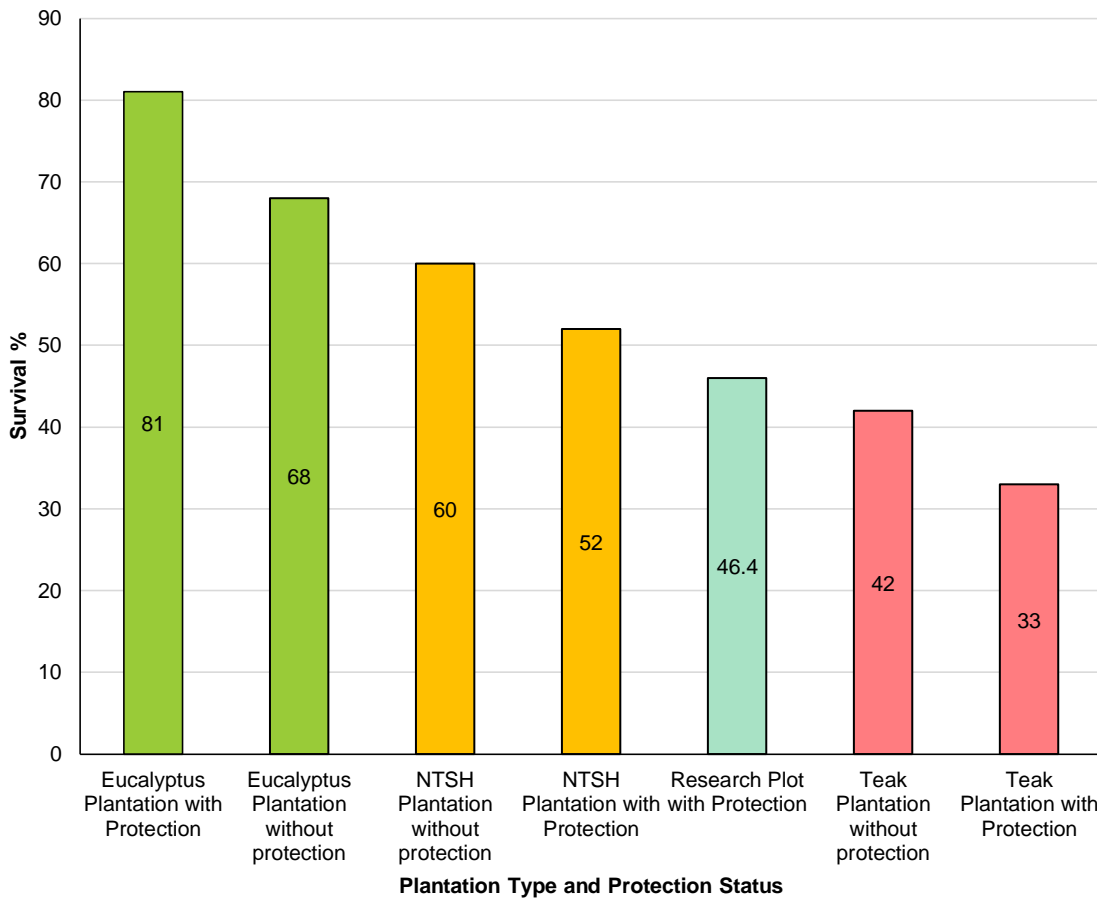
Findings: Comparison of planting methods adopted by TSFD for raising plantations during 2012-2013 is shown in Fig 5.3.4a. **Comparison of the two different planting method revealed that plantations raised under SMM performed better than those plantations raised under LIM.**

Fig 5.3.4b Performance of different plantation method of TSFD CAMPA during 2012-2013



5.3.5 Survival percentage of plantations with protection and without protection: Comparison survival of different plantation types with protection and without protection. It is shown in Fig 5.2.5. It reveals that survival of Eucalyptus plantations was more (81%) under protection and lower (68%) in areas without protection. Survival of plants raised under NTSH and Teak plantations were higher in areas without protection. Plantations under R&D were raised without protection, the survival percent recorded was 46.4%.

Fig: 5.3.5: Impact of protection on survival percentage in different plantation types

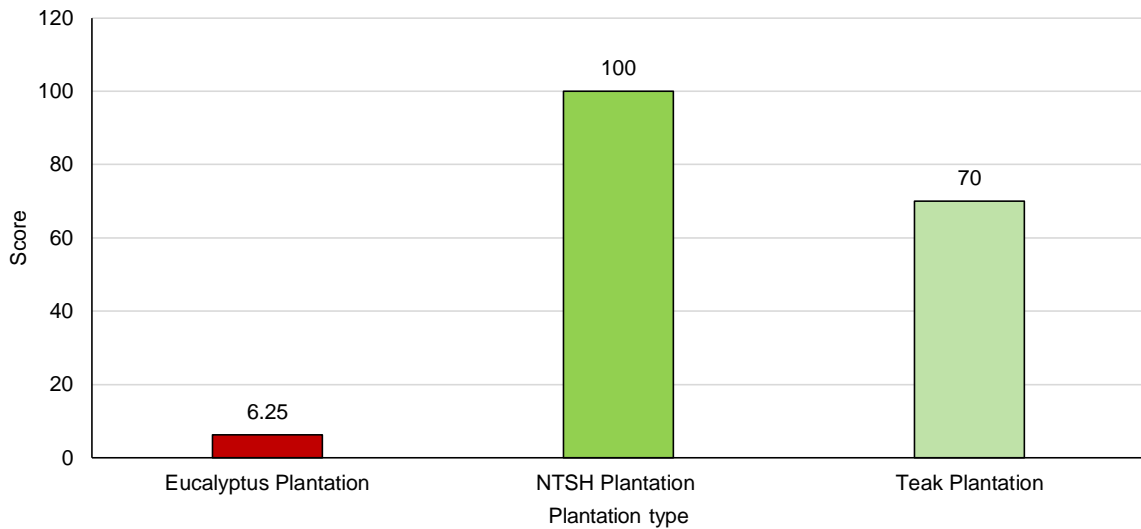


Findings: Under protection, plantation survival was more only in Eucalyptus. In other plantations types, survival was lower in areas with protection. This is perhaps due to the reason that the sites were earlier encroached and plantations were carried out after the eviction, etc. There are high biotic interferences including grazing pressure.

5.4 Habitat improvement: Comparison of plantations on habitat improvement under different plantation type is shown in Fig 5.4. Presence of wildlife any indications like the presence of scat/dung during evaluation in the plantations raised under TSFD CAMPA were recorded. Percent record of indicators was used to score habitat improvement.

Presence of wildlife was recorded in hundred percent of NTSH plantations raised under TSFD, CAMPA, followed by teak plantations. Presence of wildlife was recorded in 70% of the teak plantations. Presence of wildlife was observed only in 1% of the sites under eucalyptus plantations.

Fig 5.4: Comparison of percent HI indicator present under different plantation type



Findings: Presence of wildlife was recorded in hundred percent of NTSH plantations raised under TSFD, CAMPA. Presence of wildlife was recorded in 70% of the teak plantations and only in 6.25% of the eucalyptus plantations during field evaluation signs of wildlife or wildlife was observed. It reflects that although the survival percentage of NTSH plantations are lower in comparison to that of eucalyptus plantation yet wildlife species prefers NTSH plantations as their habitat.

5.5 Growth of trees: Comparison of average height and average girth of different tree species raised under TSFD CAMPA during 2012-2013 is shown in Figure 5.5. Eucalyptus plantations exhibited fast growth, in terms of height and girth in comparison to other species planted under TSFD CAMPA. Other species grown are relatively slow growing species. NTSH plantations were also raised in BHA area. Research on *Hymenodictyon excelso* revealed that this species failed in the research plots. On the other hand, *Stereospermum suaveleons*, *Choclospermum religiosum* and *Dalbergia latifolia* performance on the research plots are satisfactory. Teak is not a good performer under TSFD CAMPA plantation in all the sites. Division wise details of growth of Eucalyptus, NTSH and Teak plantations is shown in figure 5.5.1, 5.5.2 and 5.5.3, respectively.

Fig 5.5: Comparison of average height and girth of different species raised under TSFD CAMPA during 2012-2013.

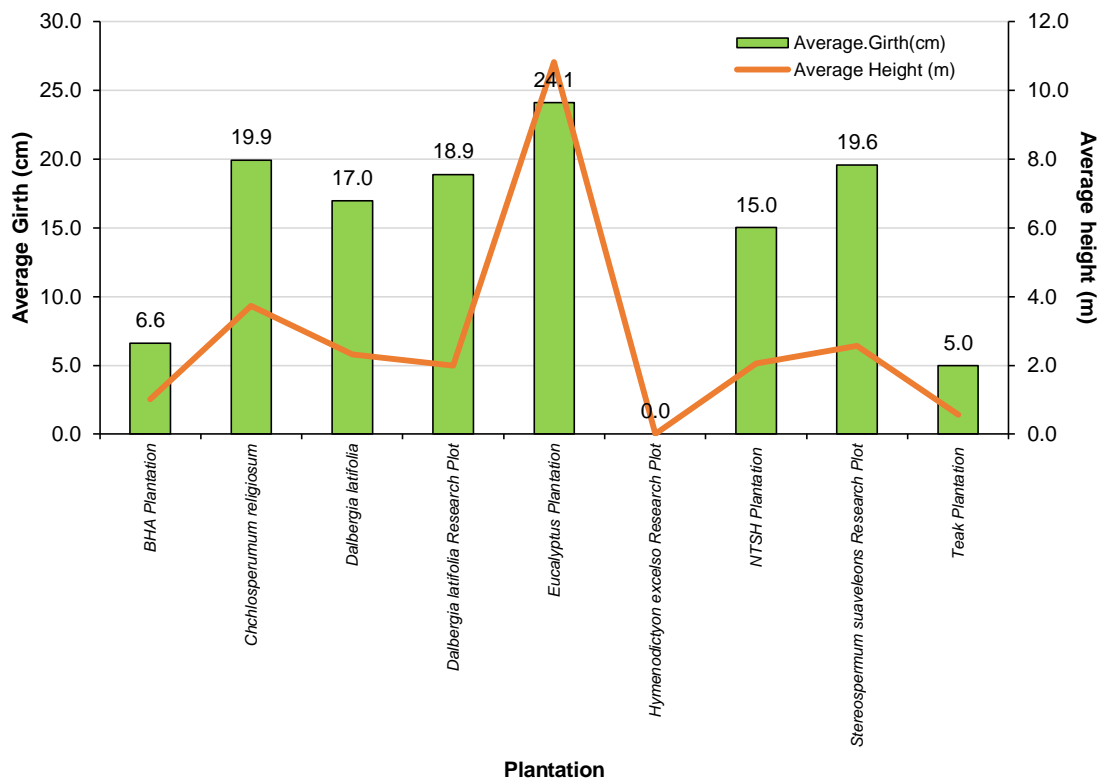


Fig 5.5.1: Division wise details for girth and height for Eucalyptus plantation 2012-13

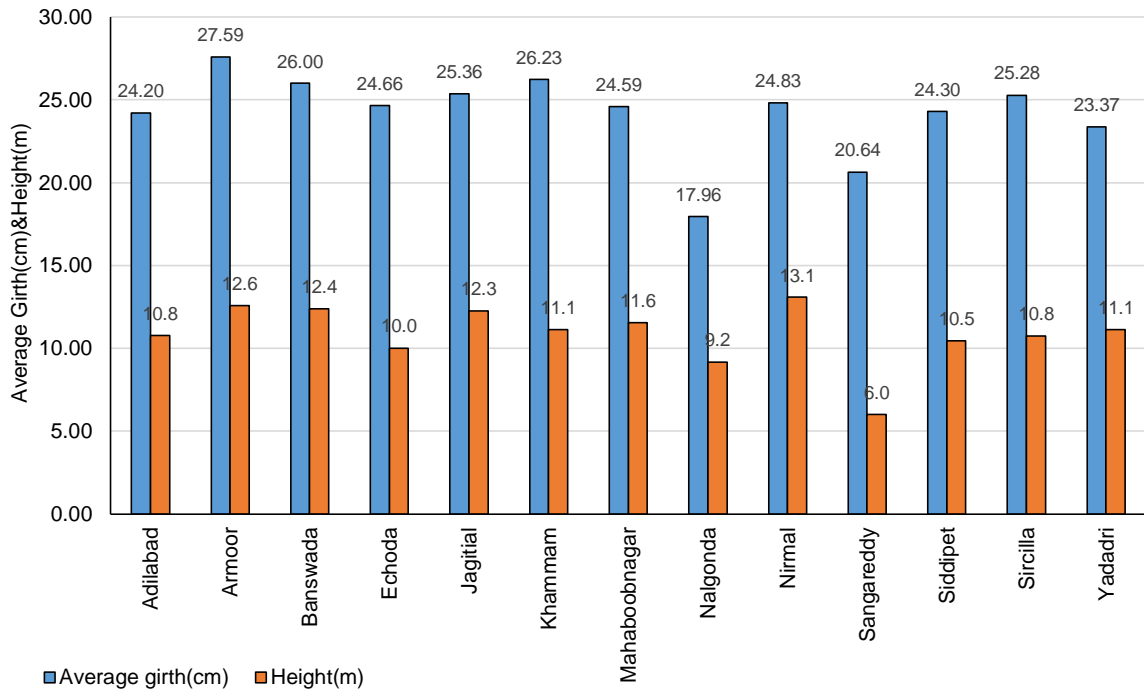


Fig. 5.5.2: Division wise details for girth and height parameters for NTSH plantation 2012-13

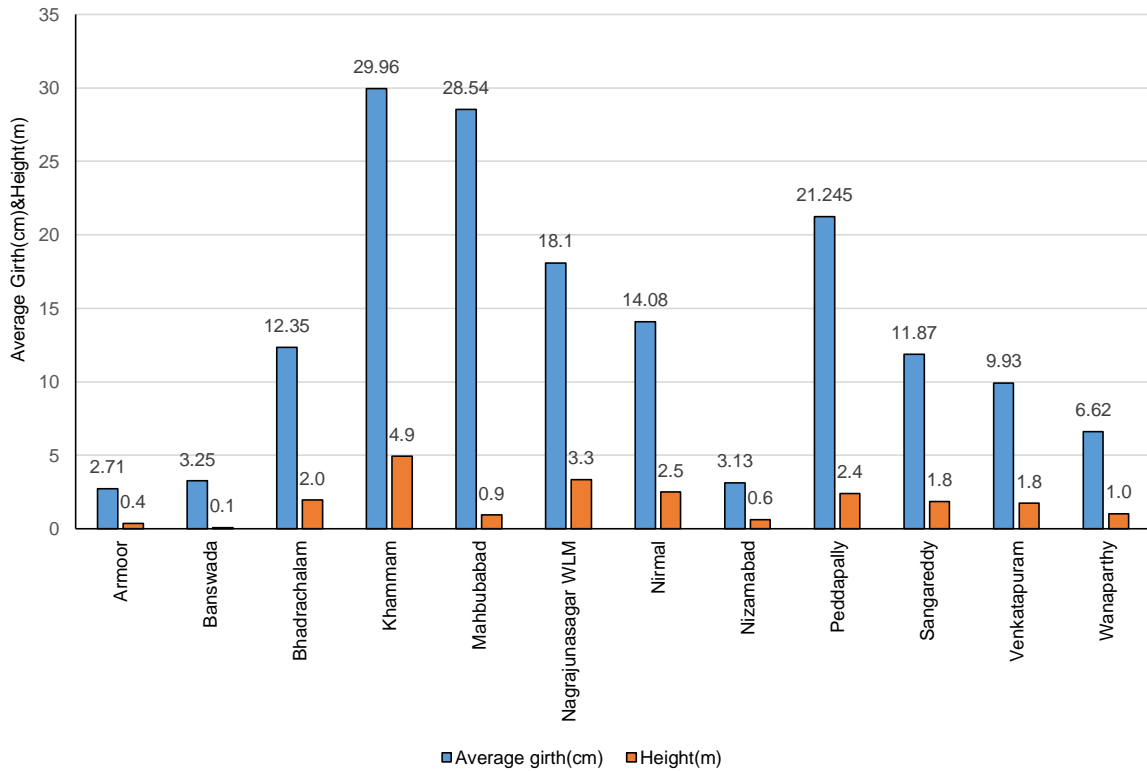
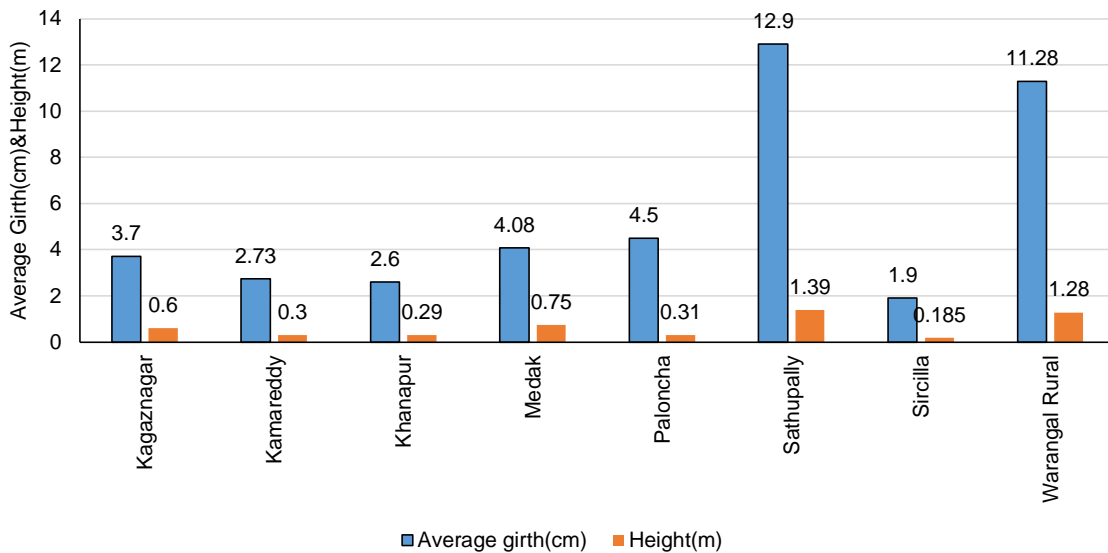


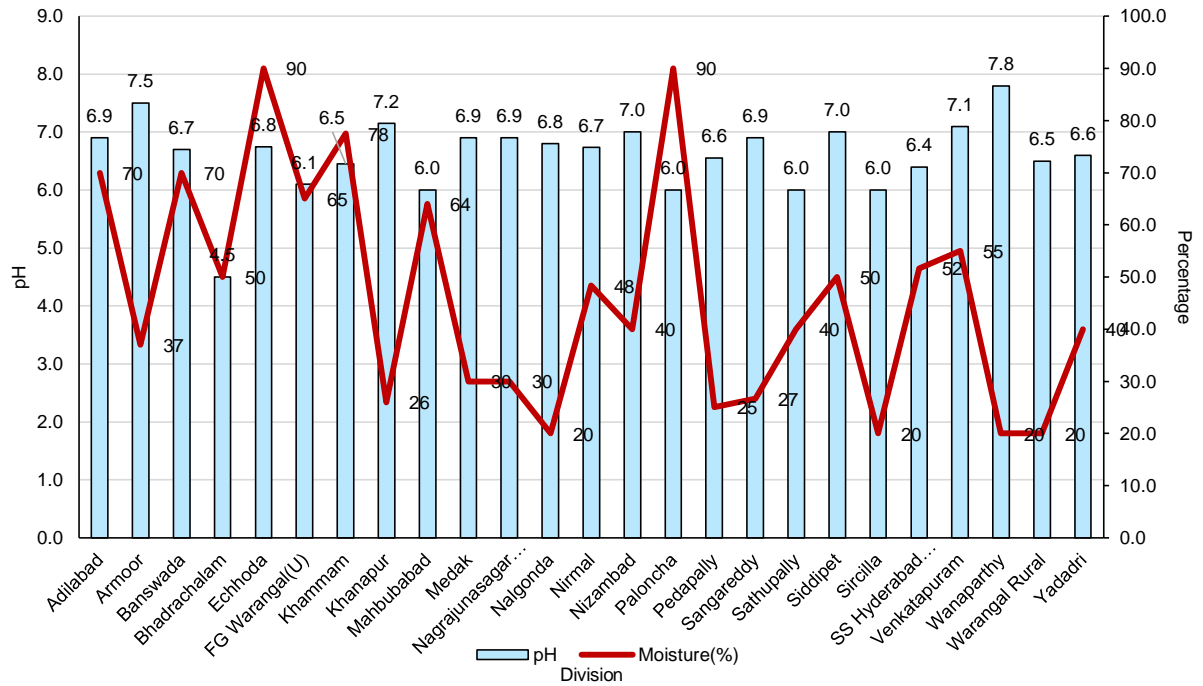
Fig 5.5.3: Division wise details for girth and height parameters for Teak plantation 2012-13



Findings: Eucalyptus plantations exhibited fast growth, in terms of height and girth in comparison to other species planted under TSFD CAMPA. Other species grown are relatively slow growing species. Even NTSH like *Hymenodictyon excelsa* failed in the research plots. On the other hand, *Sterospermum suavealens*, *Choclospermum religiosum* and *Dalbergia latifolia* performance on the research plots are satisfactory. Teak is not a good performer under TSFD CAMPA plantation in all the sites. It reflects the fact that, teak being a microsite specific species requires proper site selection and silvicultural operations for establishment and growth. Choosing mother trees for seed collection and stumps preparation is a vital factor for producing quality planting stock of teak. Teak plantlets raised in nursery needs to be acclimatized properly till the sapling stage for field transplantation. Teak also requires sufficient moisture for retaining its faster growth in the initial years. Proper synchronization of the onset of monsoon and teak plantation is vital for best field performance of this species.

5.6 Soil salinity and moisture status: Soil pH and soil moisture content recorded during the evaluation is shown in Fig 5.6. Soil pH ranged from very acidic 4.5 at Bhadrachalam to saline to 7.8 at Wanaparthy. Percent soil moisture content varied widely across the divisions. It varied from 18% to 92%.

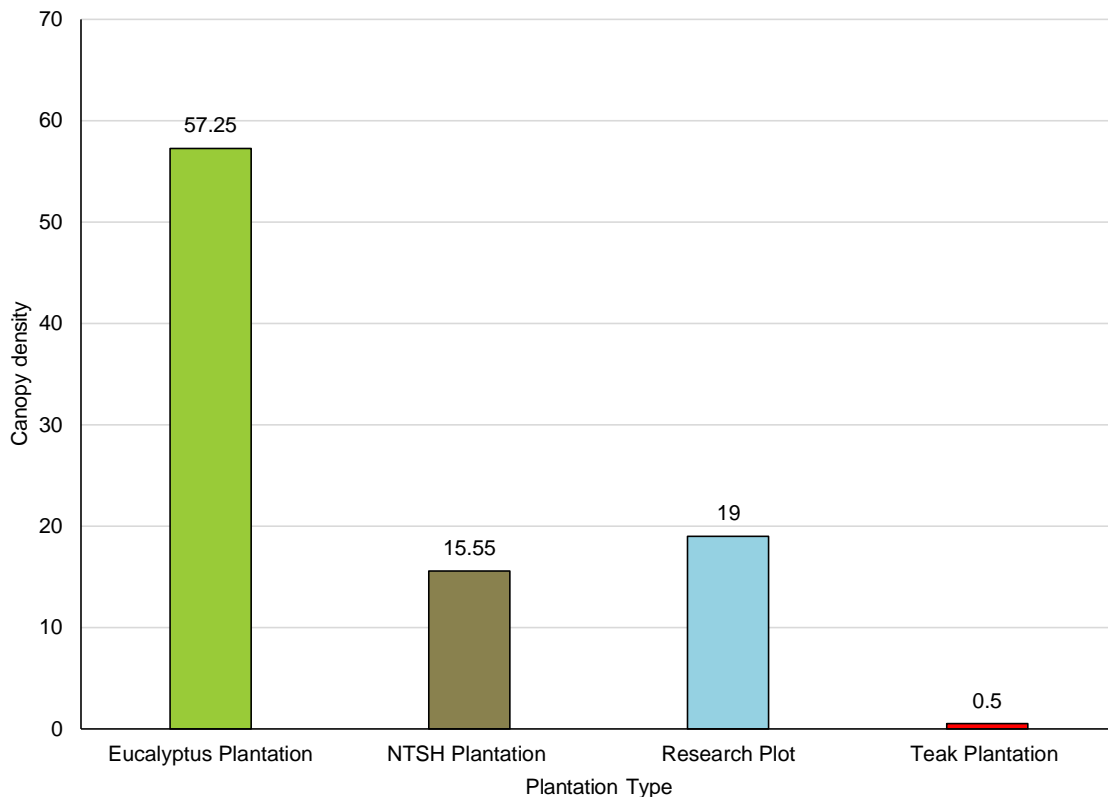
Fig 5.6: Soil pH and moisture content in the plantation sites.



Findings: Soil pH and soil moisture content are vital factors for plantations. Soil pH ranged from very acidic 4.5 to saline 7.8 across the plantation sites, indicating that soil pH amelioration practices are very necessary for better performance of plantations across the sites. Percent soil moisture content varied widely across the divisions. It varied from 18% to 92%. Higher soil moisture content was perhaps due to the rains during evaluation period. Crumb of hard soil in many places indicated that average soil moisture content is relative on a lower side not suitable for plantations without artificial irrigation or innovative methods adopted else where in such areas across the world.

5.7 Canopy density: Average canopy density (shown in fig 5.7) under different was found to be highest in eucalyptus plantation followed by research plots. Average canopy density of NTSH plantations was found to be 15.55 and that plantations raised under research and development was found to be 19. The lowest canopy density was found for the teak plots.

Fig: 5.7: Average canopy density under different plantation types



Findings: Average canopy density was found to be highest in eucalyptus plantation due to its attainment of faster growth. Average canopy density of NTSH plantations were found to be 15.55 and that plantations raised under research and development was of found to be 19. It indicates necessity of regular silvicultural practices for raising NTSH and Teak plantations in the state in blocks on scrub and open areas.

5.8 Forest carbon: Forest carbon (shown in fig 5.8) was estimated using the standard methodology adopting allometric equations (see Box) as given by FSI.¹⁶ Allometric equations are applied only on those species that are above 10 cm in diameter. Average per hectare forest carbon varied from 0.04 tonnes per hectare to 0.09 tonnes per hectare. Khammam division exhibited

¹⁶ FSI (2011) Carbon Stocks of India's Forest.

highest forest carbon i.e. 0.09 tonnes per hectare followed by Armoor (0.08 tonnes per hectare). Lowest average forest carbon per hectare in plantations raised under TSFD CAMPA during 2012-2013 was observed in Nalgonda (0.04 tonnes per hectare).

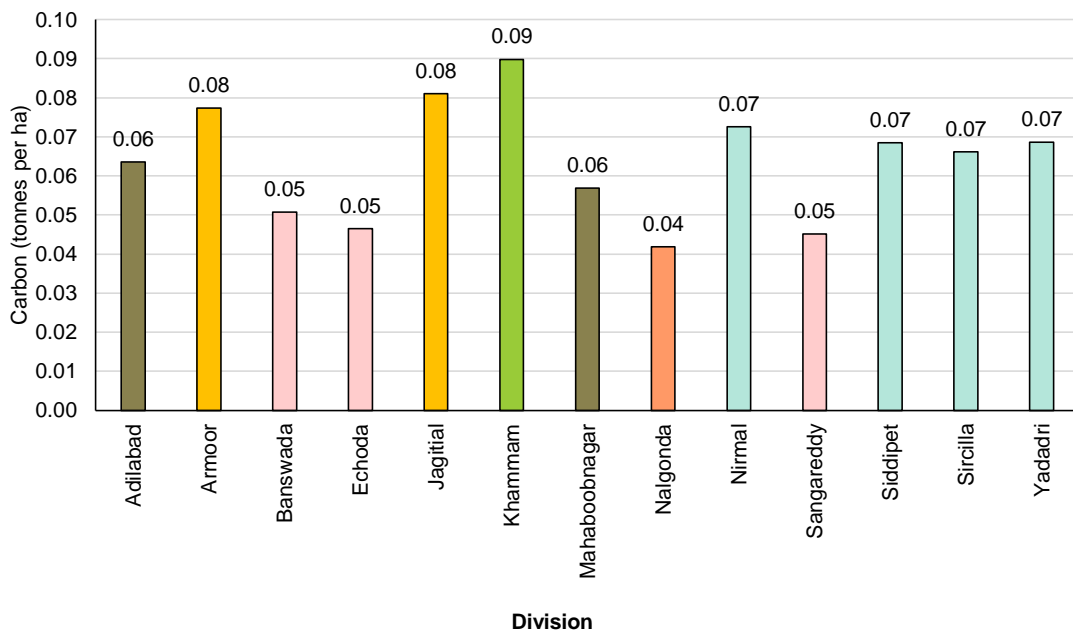
The average per hectare carbon under eucalyptus plantation raised under TSFD CAMPA during 2012 – 2013 is 1.03 tonnes whereas, the average per hectare carbon of NTSH plantations raised under TSFD CAMPA during 2012-2013 is 0.01 tonnes per hectare.

South Deccan

S.No.	Species Name	Volume Equation
1	<i>Acacia auriculiformis</i>	$\sqrt{V} = -0,00142 + 2,61911 D - 0,54703 *D$
2	<i>Albizia amara</i>	$\sqrt{V} = -0,07109 + 2,99732 D - 0,26953 *D$
3	<i>Anogeissus latifolia</i>	$V = 0,289 - 2,653 D + 11,771 D^2$
4	<i>*Butea monosperma(Old) Butea frondosa</i>	$V = 0,088183 - 1,490948 D + 8,984266 D^2$
5	<i>Chloroxylon swietenia</i>	$V = -0,0532 D + 3,2378 D^2$
6	<i>Dalbergia paniculata</i>	$V = 0,18945 - 2,46215 D + 10,54462 D^2$
7	<i>Eucalyptus species</i>	$V = 0,02894 - 0,89284 D + 8,72416 D^2$
8	<i>Hardwickia binata</i>	$V = 0,063632 + 5,355486 D^2$
9	<i>Lagerstroemia parviflora</i>	$V = 0,066188 - 1,334512 D + 9,403257 D^2$
10	<i>Lannea coromandelica/lannea grandis/odina wodier</i>	$V = 0,091153 - 1,66153 D + 10,24624 D^2$
11	<i>*Syzygium cumini/jambolanum (Old) Eugenia jambolana</i>	$V = 0,088183 - 1,490948 D + 8,984266 D^2$
12	<i>Tectona grandis</i>	$V = -0,2414 + 2,8458 D - 5,5816 D^2 + 14,816 D^3$
13	<i>Terminalia crenulata/tomentosa</i>	$V = 0,051812 - 1,076790 D + 7,991280 D^2$
14	<i>Terminalia paniculata</i>	$V = 0,13100 - 1,87132 D + 9,47861 D^2$
15	<i>Wrightia tinctoria</i>	$\sqrt{V} = 0,050294 + 3,115497 D - 0,687813 \sqrt{D}$

* For these species, Rest of species's Volume Equation is used.

Fig 5.8: Division wise Carbon content of Eucalyptus plantation in 2012-2013



Findings: Average per hectare forest carbon varied from 0.04 tonnes per hectare to 0.09 tonnes per hectare. Khammam division exhibited highest forest carbon i.e. 0.09 tonnes per hectare followed by Armoor (0.08 tonnes per hectare). Lowest average forest carbon per hectare in plantations raised under TSFD CAMPA during 2012-2013 was observed in Nalgonda (0.04 tonnes per hectare).

5.9 Data analysis of CAMPA Other Activities: Data collected for CAMPA other activities during field evaluation of the sample CAMPA activities for the year 2012-2013 were digitized, collated and checked as per the audited records available at the O/o PCCF, TSFD, Aranya Bhavan. Thereafter, the data was analysed to understand the deviation with that of field and any other critical issues on the CAMPA activities for the state of Telangana.

5.9.1 Soil and Water Conservation Measures: Different soil and water conservation activities (SWC) were undertaken under TSFD CAMPA during 2012-2013. The random samples evaluated comprised of rock filled dam, construction of check dam and construction of water tanks. The score of the evaluated samples is provided in table. 5.9.1. Details of sample evaluation details are provided in Annexure V. The total score of the evaluated samples based on the deviation on records and on-field conditions of the sampled SWC activity under TSFD, CAMPA during 2012-2013 is 300.

Table 5.9.1: 3rd party CAMPA evaluation score of SWC samples for 2012-2013.

S.No.	Division	Range	Beat	Activity	Lat	Long	Remarks	Score
1	Yadadri	Yadadrigutta		Rcok filled dam,	17.6880	78.8964	Length= 4 to 10 metres; Breadth- 1.5 metres (average); Height = 0.5 meters	100
2	Wanaparthy	Wanaparthy	Jagathpally	Water tank	16.3766	77.9979	Earthwork and excavation, plain concrete cement, masonry works, basement filling, RCC works, 20 mm plastering works 60 mm gauge, HYSD bars. Long wall (1x2) 3m x 0.5m x 1.2m = 3.24 cu.m.; Short wall (1x2) 1.9m x 0.45mx 1.2m = 2.05 cu.m	100
3	Kinnersani WLM	Regalla	Markode	CC Dam	17.9238	80.537445	Earthwork; C.C Bed 1 : 4 : 8 ; C.C Bed 1 : 3 : 6 ; Plastering.	100
Total score								300

Findings: Soil and water conservation measures undertaken by TSFD CAMPA is able to retain water for a two to a maximum of about six months. However, during field evaluation, it was observed that regular maintenance operations of soil and water conservation structures constructed is lacking. During field evaluation sites had siltation and presence of other debris.

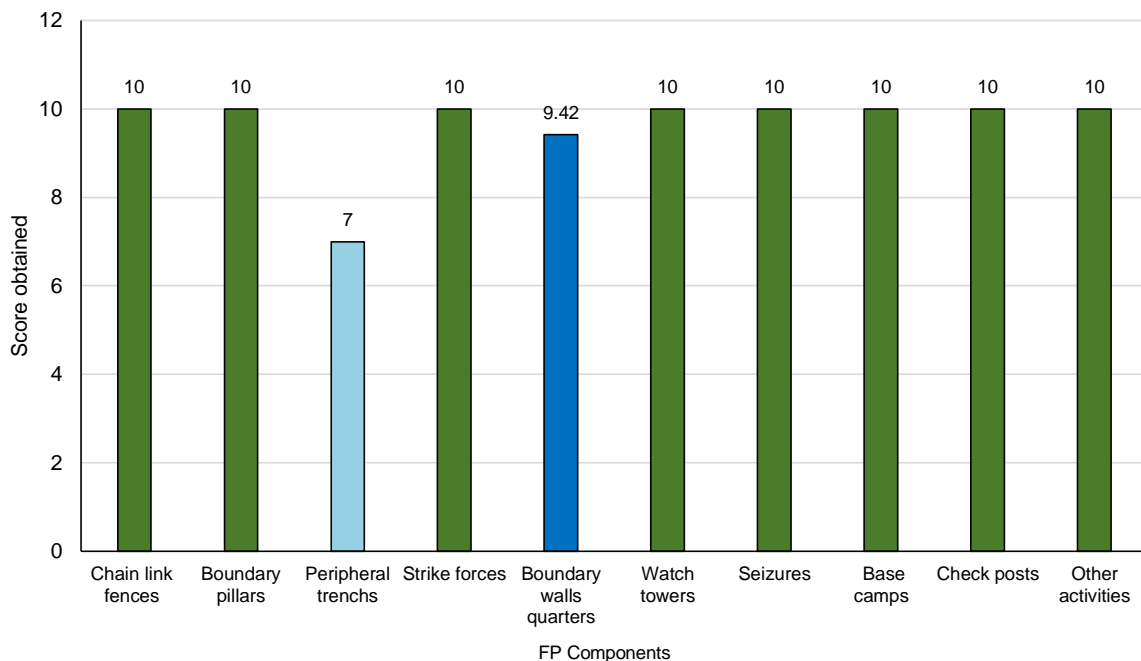
5.9.2 Other activities under CA and NFM: A total of 359 different activities were undertaken CA and NFM by TSFD CAMPA during 2012-2013. Thirty-six samples were evaluated under CA and NFM other activities. Sample evaluation details is provided in Annexure V. Average score based on the percent variation obtained by each CA/NFM other activities is shown in Figure 5.9.2. **The total score obtained by CA and NFM other activities is 10 out of 10.**

5.9.3 Forest Protection: A total of 667 different forest protection activities (FP) were undertaken by TSFD CAMPA during 2012-2013. Sixty-seven samples were evaluated under ten sub-components of FP (table 5.9.3). Sample evaluation details is provided in Annexure V. Average score based on the percent variation obtained by each FP sub-component is shown in Figure 5.9.3. **The total score obtained by summation of sub components forest protection is 96 out of 100.**

Table 5.9.3: Number of samples evaluated under different sub-components of FP.

No.	Forest Protection (FP) sub components	Number of samples
A	Chain link fences	1
B	Boundary pillars	2
C	Peripheral trenches	3
D	Strike forces	12
E	Boundary walls quarters	7
F	Watch towers	1
G	Seizures	1
H	Base camps	8
I	Check posts	3
J	Other activities	29
Total		67

Fig 5.9.2: Score of evaluated samples under different FP subcomponents



Findings: Of ten FP sub-components evaluated, variation of dimension was observed in activity under one sub-component i.e. peripheral trenches. In Bhupalpally, during field evaluation, the variation was found to the extent of 33%. In most of the places, the trench is filled with soil and mud. Villagers and domestic cattle were freely moving in and out of the forest plantations during evaluation reflecting failure of the purpose of digging the trench.

5.9.4 Forest Fire Management: A total of sixty-nine different forest fire management (FFM) works were undertaken by TSFD CAMPA during 2012-2013. 10% sample, i.e. 7 samples all falling under one sub-component namely fires watchers were evaluated. Scores obtained during field evaluation is provided in table. 5.9.4. Sample evaluation details is provided in Annexure V. Average score based on the percent variation obtained by FFM component is shown in Figure 5.9.4. **The average score obtained by forest protection is 10 out of 10.**

Table 5.9.4: Evaluation summary of FFM samples.

S.No.	Division	Range	Activity	Score	Average score
1	Amrabad	Mannanur	Wages of Fire Watchers for maintaining the existing fire line, Mannanur Range	10	10
2	Nalgonda	Miryalaguda	Fire watcher in Miryalaguda Range	10	
3	Wanaparthy	Wanaparthy	Wages to fire watcher at Wanaparthy from April 13 to March 13	10	
4	Nagarjunasagar WLM	Nagarjunasagar	Estimate for Wages to Fire watchers (for the period from 4/2012,5/2012 & 1/2013,2/2013 & 3/2013)	10	
5	Nalgonda	Nalgonda	Engaging of fire watchers at Cherukupally RF during 2012-13 Devarkonda	10	
6	Hyderabad	Vikarabad	Wages paid to firewatcher	10	
7	Siddipet	Siddipet	Engaging of Fire Watchers for maintaining the existing fire lines (for 5 months per year in fire season i.e. April, May, 2012 and January, February, March, 2013)	10	

Findings: Highest FFM works were undertaken in Hyderabad followed by Bellampally. Evaluation of fire lines made at least two years back cannot be evaluated on the field. Evaluation was done on the basis of the available records.

5.9.5 Biodiversity Conservation and Development (BDC): A total of 599 different biodiversity conservation and development activities were undertaken by TSFD CAMPA during 2012-2013. Sixty samples were evaluated under ten sub-components of BDC (*table 5.9.4*). Sample evaluation details is provided in Annexure V. Average score based on the percent variation obtained by each BDC sub-component is shown in Figure 5.9.5. **The total score obtained by summation of BDC sub-components is 89 out of 100.**

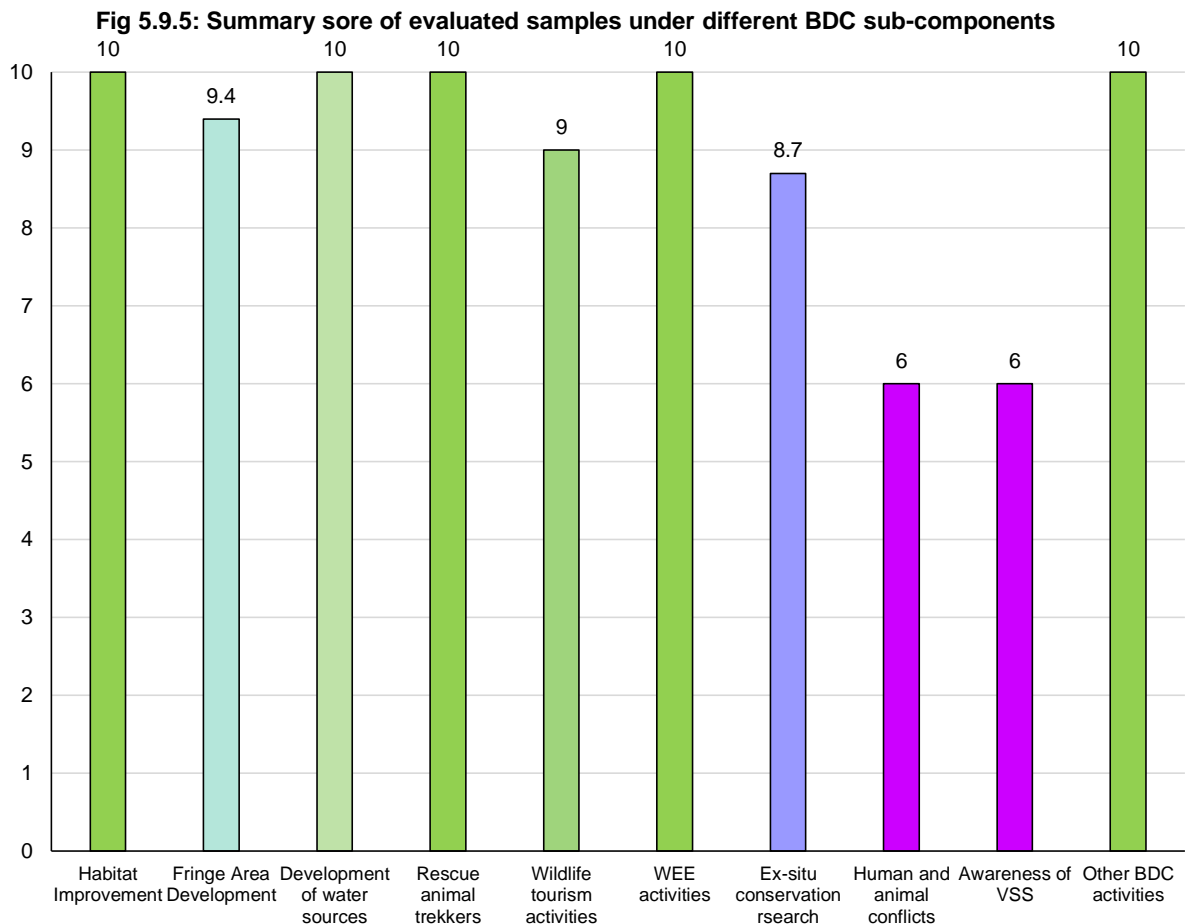


Table 5.9.5: Number of samples evaluated under different sub-components of BDC.

No.	BDC sub components	Samples
A	Habitat Improvement	8
B	Fringe Area Development	18
C	Development of water sources	6
D	Rescue animal trekkers	10
E	Wildlife tourism activities	3
F	WEE activities	7
G	<i>Ex-situ</i> conservation research	3
H	Human and animal conflicts	1
I	Awareness of VSS	1
J	Other BDC activities	3
Total		60

Of 10 habitat improvement, activities under rescue, animal trekkers and WEE activities scored full 10 points. Fringe area development and wildlife tourism activities scored 9.5 and 9 respectively,

followed by *ex situ* conservation (8.7). Human and animal conflicts and awareness of VSS scored the lowest i.e. 6.

Findings: There were 599 works under BDC component undertaken in TSFD CAMPA. Highest activities were undertaken in Jannaram WLM followed by Warangal WLM. Habitat improvement, activities under rescue, animal trekkers and WEE activities scored full 10 points. Fringe area development and wildlife tourism activities scored 9.5 and 9 respectively, followed by *ex situ* conservation (8.7). Human and animal conflicts and awareness of VSS scored the lowest i.e. 6.

5.9.6 Research & Development (R&D): The total number of different works under CAMPA NPV component research and development undertaken by TSFD CAMPA during 2012-2013 is 326. 10% of the total works, 32 samples of R&D were evaluated. Details of evaluated samples is provided in Annexure V. Average score based on the percent variation obtained by each R&D samples is shown in Table 5.9.6. **The average score obtained by Research and Development is 9.75 out of 10.**

Table 5.9.6: Summary of R&D sample evaluation.

S.	Division	Range	Activity	SO.No	Lat	Long.	Characteristic	Score	Avg. score
1	SS Hyderabad	Dullapally	Estimate for maintenance of Arboretum (3.5 ha) 1500 nos at FRC Dullapally during 2012-13	12/20 12- 13/S2	17.54 37	78.4617	Watering of 1500 bag plants, Application of fertiliser, Weeding cum interploughing, 2 protection watcher for 12 months	10	9.75
2	SS Hyderabad	Dullapally	Estimate for raising & maintenance 25000 nos of RT nursery and raising of (4X7) 1.00 lakh nos bag plants nursery at FRC Dullapally	15/20 12- 13/S2	-	-	Clearing of 100 cc root trainers, filling of root trainers, cutting and pricking out seedling, Replacing causality twice watering, weeding the root trainers, application of insecticide and pesticides, cost of polythene bags, preparation of soil mixture.	6	
3	SS Hyderabad	Dullapally	Estimate for preparation of 70 cmt of vermicompost at FRC Dullapally during 2012-13	18/12- 13/S2	17.54 045	78.4610	Collection of green leaf, vegetable waste, shredding of waste mixed chopped material. The total amount sanctioned is 88145 and spent amount is 83370	10	

S.	Division	Range	Activity	SO.No	Lat	Long.	Characteristic	Score	Avg. score
4	SS Hyderabad	Dullapally	Estimate for extension of climber garden 5x5 mtr cement brick at FRC Dullapally during 2012-13	47/12-13/S2	17.54045	78.461089	Stick preparation, Alignment and fixing, Transportation of bags plant, loading and unloading, Internal transportation, Planting bag plant, Watering of plants 6times for 1month. Total amount sanctioned is 92566 and spent amount is 80000	10	
5	SS Hyderabad	Dullapally	Estimate for maintenance of old test plots CSO, experimental plots at FRC Dullapally during 2012-13	55/2012-13/S2			Deweeding and uprootal of lantana and cost of fertilizer applications	10	
6	Warangal Urban	R.R.Warangal -II	Maint. of Phyllanthus emblica (CMA) - 96-97 at JRC during 2012-13	2/Wgl. II/12-13	18.1374	79.8640	Weeding and soil working, cutting of coppice growth , Application of Fertilizer	10	
7	Warangal Urban	R.R.Warangal -I	Est. for Maint. Of seed godown in R R Wgl-I O/o FG Wgl during 2012-13	7/Div/12-13	17.9901166	79.54060167	Wages to watcher for five months May, June and July in 2012 and January and February in 2013 with per day charge of Rs 243. Total amount sanctioned Rs75816 and amount spent Rs 44226	10	
8	Warangal Urban	R.R.Warangal -I	REV. Est. for Maint. Of Kakatiya arboretum (seed colln. Centre) at Warangal during 2012-13	8/Div/12-13	18.0234167	79.547495	Protection charges for one watchers for 12 months, uprootal of Mahaveera, Painting work and Miscellaneous expenses.	6	
9	Warangal Urban	R.R.Warangal -I	Est. for improvement & maint. Of nursery infrastructure irrigation system and electriciy in WRC during 2012-13	9/Div/12-13	17.9910683	79.54019497	Electricity charges for the irrigation system in the mist chambers for six months,	10	
10	Warangal Urban	R.R.Warangal -II	Maint.of Tectona grandis (CSO) 92-93 at JRC during 2012-13	9/Wgl. II/12-13	18.1369633	79.8645	The activity involves cutting coppice growth first operation, Second operation, cost of pesticides, and use of fertilizer.	10	

S.	Division	Range	Activity	SO.No	Lat	Long.	Characteristic	Score	Avg. score
11	Warangal Urban	R.R.Warangal -II	Maint. of Gmelina arborea 2007-08 at JRC during 2012-13	23/Wg I.II/12-13	18.13 8055	79.8644 0667	The activity involves cutting coppice growth first operation, Second, operation, cost of pesticides, and use of fertilizer.	10	
12	Warangal Urban	ARC	Estimate for maintenance of nursery and Electrical bills for R.R.Achutapuram during the year 2012-13	06/AR C/ 12-13	-	-	Maintenance of nursery and generator.	10	
13	Warangal Urban	ARC	Estimate for maintenance of Field Research Station and old plantations boards at ARC during the year 2012-13	07/AR C/ 12-13	-	-	Maintenance of ARC Nursery, and of ARC old plots, Purchase of Nursery article, for four months.	10	
14	Warangal Urban	R.R.Warangal -I	Est. for Maint. Of medicinal garden in RR Warangal-I at O/o Forest Geneticist, Wgl during 2012-13	2/Wgl- I/12-13	17.99 12944	79.5405 9167	Maintenance of Medicinal garden, watering and weeding etc.	10	
15	Warangal Urban	ARC	Estimate for Raising of Pterocarpus marsupium (Tree breeding programme) nursery at ARC during the year 2012-13	04/AR C/201 2-13	17.24 99917	81.0475 4722	Collection and branch cutting, Transportation of branch cutting, Cost of polythene bags, preparation of potting soil mixer, opening of bag and filling of soil mixture, watering a bag twice a day, weeding the beds and misc. expenses	10	
16	Warangal Urban	Warangal Urban	The Indian Forester Monthly journal of forest and Forestry Research, Dehradun	Proc. No. 171/2 012 / DM	-	-	The include purchase charge for the forestry research journal	10	
17	SS Hyderabad	FRC Mulugu	Estimate for conversion of CPTs 100 CC RT to 5x9 bag plants 25000 nos at FRC Mulugu 2012-13	90/12-13/S2	17.72 215	78.6276	MB not provided during the time of Evaluation, Audited list verified	10	
18	SS Hyderabad	FRC Mulugu	Estimate for 2nd year maint of Dalbergia latifolia 1.00 Ha. Esp. 3x3 (1105) plants at FRC	45/12-13/S2	17.72 40056	78.6321	Circular weeding cum application of fertilizers, Internal ploughing using tractor with disc plough 3X3 after	10	

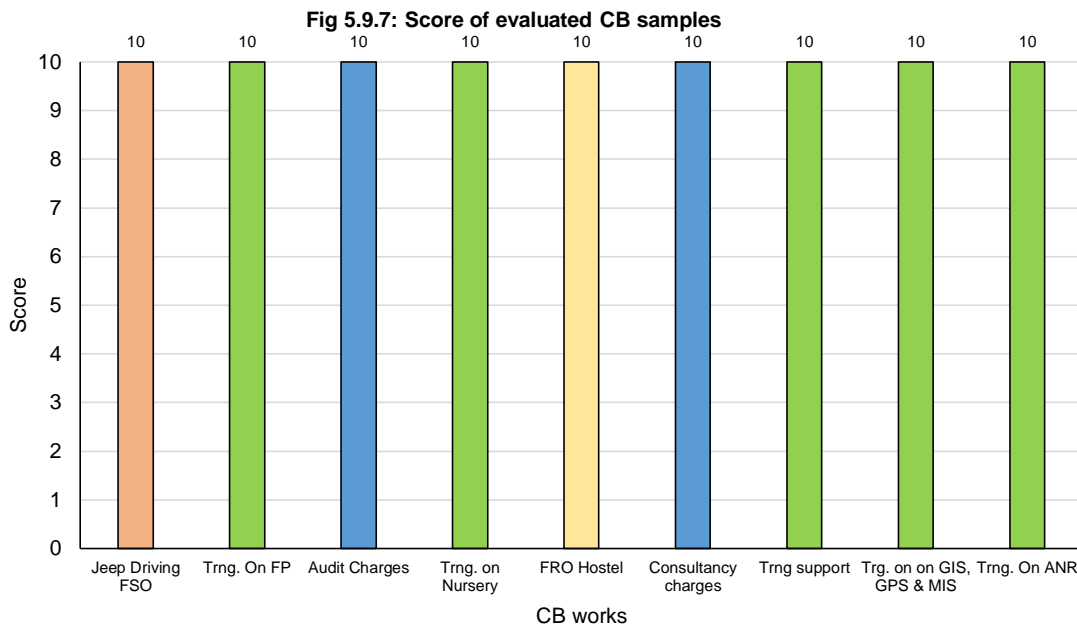
S.	Division	Range	Activity	SO.No	Lat	Long.	Characteristic	Score	Avg. score
			Mulugu during 2012-13				considering initial ploughing lines		
19	SS Hyderabad	FRC Dullapally	Maintenance of Xerox machine to Addl PCCF R&D Hyderabad	RCNo 205/2009	-	-	Details are as per the Audited list	10	
20	SS Hyderabad	FRC Dullapally	Periodical heads towards supply of newspapers to library	4/12/S	-	-	Details are as per the Audited list	10	
21	SS Hyderabad	FRC Dullapally	Amount paid to Sri K Chandra Mohan and Km Swarna Kumari Research assistant towards Honorarium for the month of January 2013	03/R12-13/S2	-	-	Details are as per the Audited list	10	
22	SS Hyderabad	FRC Dullapally	To PAO (BSI/ZSI) Kolkata towards purchase of Books to library	Rc No 211/2012	-	-	Details are as per the Audited list	10	
23	Warangal Urban	R.R.Warangal -I	Est. for POL charges and maint. Of Govt. vehicles in O/o FG Wgl during 2012-13 (FG)	10/Div /12-13	-	-	POL and maintenance charges of the government vehicles at FG Warangal-1.	10	
24	Warangal Urban	R.R.Warangal -I	Est. for detailed and abstract est. for fixing of Teak seed depulping machine at Seed processing unit, WRC during 2012-13	51/Div /12-13	17.99048	79.540506	MB not produced verified using the audited list	10	
25	Warangal Urban	R.R.Warangal -I	Est. for cost and supply stationary items for O/o FG Warangal during 2012-13	21/Wg I-II/12-13	-	-	Details verified as per audited report	10	
26	Warangal Urban	R.R.Warangal -II	Maint.of Eucalyptus (CMA)-2008-09 at JRC during 2012-13	8/Wgl. II/12-13	18.13977	79.86595	MB not produced details verified as per audited list	10	
27	Warangal Urban	R.R.Warangal -II	Maint. of Inspection paths inside Jakaram Res.Centre during 12-13	27/Wg I,II/12-13	18.13619	79.86479	MB not produced	10	
28	Warangal Urban	R.R.Warangal -II	Maint.of Oroxyllum indicum (Demo) 2004-05 at JRC during 2012-13	19/Wg I,II/12-13	18.13807	79.86448	Weeding and soil working, cutting of coppice growth, Application of Fertilizer and measurement of growth parameters	10	

S.	Division	Range	Activity	SO.No	Lat	Long.	Characteristic	Score	Avg. score
29	Warangal Urban	R.R.Warangal -II	Maint. of Melia dubia (Progeny) 2010-11 at JRC during 2012-13	26/Wg I.II/12-13	18.14 010	79.8630 1	Weeding and soil working, cutting of coppice growth, Application of Fertilizer and measurement of growth parameters	10	
30	Warangal Urban	R.R.Warangal -I	Rev. Est. for Production of Organic compost at WRC during 2012-13	67/Div /12-13	17.99 057	79.5393 9	MB not produced, verified as per audit list	10	
31	Warangal Urban	R.R.Warangal -I	Est. for Seed Transportation of various user agencies at RR Wgl-I O/o FG Wgl during 2012-13	12/Wg I-I /12-13	-	-	Details as per audit	10	
32	Warangal Urban	R.R.Warangal -II	Maint. of Pongamia pinnata (CMA)-04-05 at JRC during 2012-13	3/Wgl. II/12-13	18.13 845	79.8647 6	Weeding and soil working, cutting of coppice growth , Application of Fertilizer and measurement of growth parameters	10	

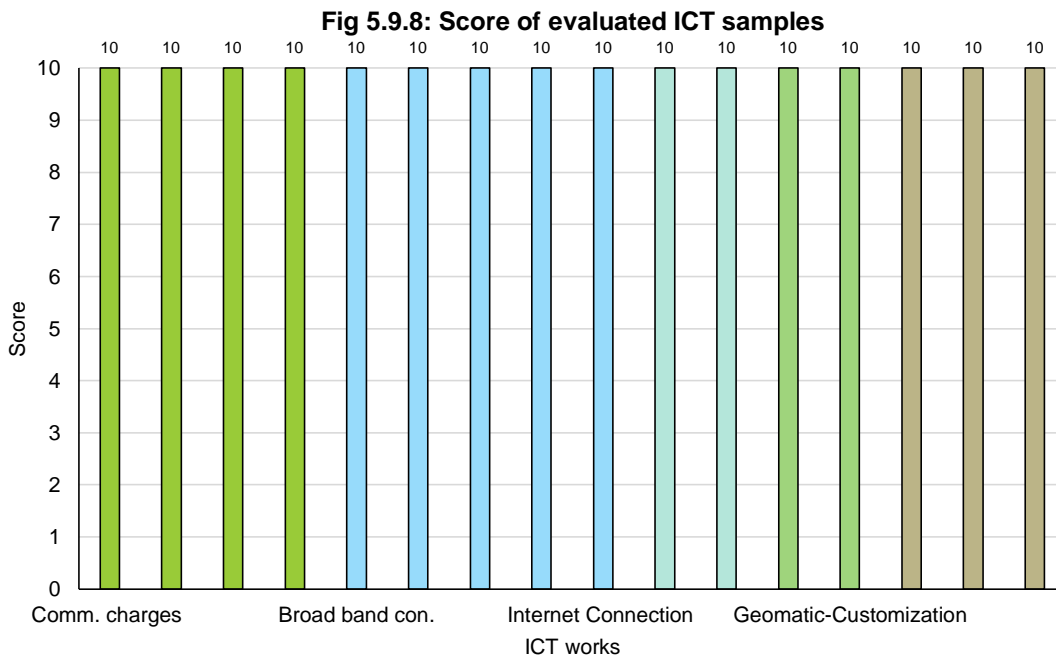
Findings: FG Warangal having four centers across the state and SS Hyderabad undertook 326 R&D activities under TSFD CAMPA. However, during field evaluation plantations raised on R&D plots scored lower than those raised under NFM and CA.

5.9.7 Capacity Building: CB activities were undertaken in Telangana State Forest Academy under CAMPA NPV component during the year 2012-2013. The total number of different works under CB component undertaken by TSFD CAMPA during 2012-2013 is 94. 10% of the total works, 9 samples of CB were evaluated. Details of evaluated samples is provided in Annexure V. Average score based on the percent variation evaluated on the basis of the available documents is shown in Fig 5.9.7. **The total score obtained by CB is 10 out of 10.**

Findings: All the CB activities was undertaken in Telangana State Forest Academy, Dullapally. CB activities full points during evaluation. There are training programmes for forest officials both within and outside the state on nursery raising, plant protection, jeep driving. Infrastructure development for housing trainees are also carried out under CAMPA in TSFA, Dullapally.

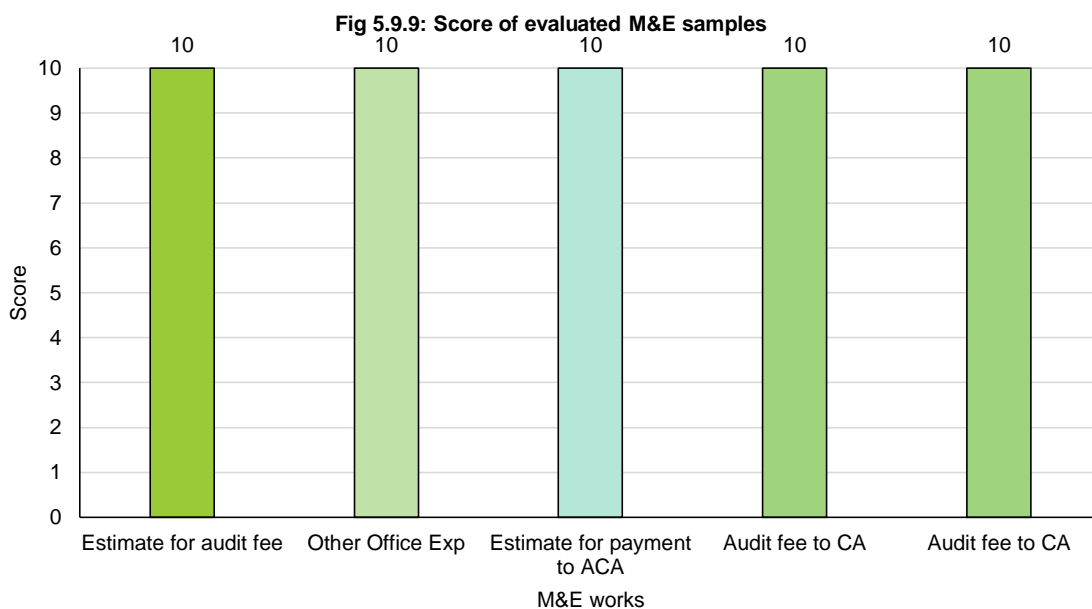


5.9.8 Information Communication and Technology (ICT): The total number of different works under ICT component undertaken by TSFD CAMPA during 2012-2013 is 158. 10% of the total works, 16 samples of ICT were evaluated. Details of evaluated samples is provided in Annexure V. Average score based on the percent variation obtained by each ICT samples is shown in Fig 5.9.8. The total score obtained by ICT is 10 out of 10.



Findings: There were a total of 158 activities undertaken in 2012-2013. ICT was booked under Khammam, Warangal North, Karimnagar East and Karimnagar West. ICT activities were under ICT, Head Office. ICT activities evaluated based on the available records indicated highly satisfactory performance.

5.9.9 Monitoring & Evaluation (M&E): The total number of different works under M&E component undertaken by TSFD CAMPA during 2012-2013 is 46. 10% of the total works, 5 samples of M&E were evaluated. Details of evaluated samples is provided in Annexure V. Score based on the percent variation of each M&E samples evaluated on the basis of available documents is shown in Fig 5.9.9. The total score obtained by M&E is 10 out of 10.



Findings: There were a total of 46 activities under M&E undertaken in 2012-2013. M&E activities evaluated based on the available records indicated highly satisfactory performance.

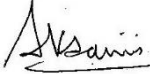





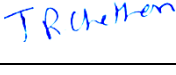



5.9.10 Office Support (OS): The total number of different works under OS component undertaken by TSFD CAMPA during 2012-2013 is 10. 10% of the total works i.e. 1 sample namely other office expenditure incurred by Jannaram division was evaluated. Details of the evaluated sample is provided in Annexure V. **Total score based on the percent variation of the OS activity evaluated on the basis of the available documents is 10 out of 10.**

Findings: There were a total of 10 activities under OS undertaken in 2012-2013 in Kamareddy, Nizamabad and Warangal North divisions. OS activities evaluated based on the available records indicated highly satisfactory performance.

5.10 Over all evaluation score: Scores obtained by different plantation activities and other activities under different CAMPA components is shown in Table 5.10. The total score obtained for the 2012-2013 CAMPA activities is **900.11** out of **1115** i.e. **80.72%** indicating “**satisfactory performance**”.

Table 5.10: Overall scoring of TSFD CAMPA undertaken during 2012-2013.

Quantitative Aspects (A)				Qualitative Aspects (B)			
S.	Main heading	Score	Total	S.	Main heading	Score	Total
I.	Plantation activities (CA and NPV)	315.34	500	I.	Impact of awareness generation campaign	1.5	5
II	Soil and Water Conservation Measures (CA)	300	300	II.	Identification of approved site for plantation	3	5
II.	Other activities (CA & NFM)	10	10	III.	Improvement in quality of wildlife habitat	2.9	5
III.	Forest Protection	96.42	100	IV.	CAMPA benefits (SC/ST/BPL households)	10	10
IV	Forest Fire Management	10	10	V.	Project Awareness	2	5
V	Biodiversity Conservation	89	100	VI.	Transparency, maintenance and payments	2.5	5
VI	Research & Development	9.75	10	VII.	Maintenance of assets created	7.7	10
VII	Capacity Building	10	10				
VIII	ICT	10	10				
IX	Monitoring & Evaluation	10	10				
X	Office Support	10	10				
Total (A)		870.51	1070	Total (B)		29.6	45.00
Grand Total (A+B)						900.11	1115.00

Name of evaluators	Signatures	Name of evaluators	Signatures
Dr. Satvant K Saini		Dr. Saurindra Nr Goswami	
Akhilesh Singh		Amit Ashok Singhe	
Ankit Rawat		Aniket Choudhury	
Chetan TR		Rohit Kumar	
Raj Kumar Arya		Neeraj Agrawal	

5.11 Third party critical comments

1. Project constraints/limitations

What were the constraints /limitations faced by the project authority based on evaluator? Specify

- a) Lack of community participation in CAMPA activities.
- b) Lack of readily available quality planting materials of Teak and NTSH species.
- c) Lack of proven nursery practices for developing quality saplings within the state.
- d) Severe pressure on lands from encroachments.
- e) Lack of sufficient time for site preparation in the degraded lands before plantation.
- f) Lack of sufficient manpower to conduct regular maintenance of plantation and structures.
- g) Lack of holistic understand on CAMPA components, reporting amongst forest department staffs.
- h) Poorly organized record keeping.

2. Suggestions for improvement

Areas of improving the project output? Specify

- a) Involvement of local stakeholders from site selection to maintenance activities.
- b) Identification of mother trees bearing areas for teak and NTSH species.
- c) Training on forest trees nursery practices for producing quality planting stocks.
- d) Planting of saplings to be synchronized with meteorological conditions (forecasting).
- e) Site - species relationships needs consideration for raising plantation.
- f) Adoption of innovative solutions (*wadi*, etc.) for soil and water on degraded areas.
- g) Emphasize on developing short rotation forest plantations as carbon sinks.
- h) Emphasize on wildlife habitat improvement including improvement of the hydrological regime.
- i) Updated CAMPA works on E-green watch and TGIMS.

3. Whether the project authorities have felt any need of improving upon any particular activity on methodology? Specify.

Stakeholders' participation in all the project activities from planning to implementation needs to be initiated. Development of ecosystem based site quality indices including key considerations of community preference, biodiversity conservation, Soil and water conservation should be included

4. Whether the people of the project area feel any need to improve any particular aspects of the project? Specify.

Presently few people from the project area were associated during implementation of activities as daily wage labour. Unless local people are totally aware of the benefits of CAMPA project and they actively participate, it is difficult to get reflections from them on the project.

5. Whether the project should be continued on the same lines or some modifications are necessary. Specify.

The project should seriously make modifications by adopting ecosystem approach to ensure ecological security of the affected areas and the livelihoods of the communities affected by forest diversions. Plantation of local species with multiple benefits instead of planting exotic monoculture like eucalyptus is necessary to improve wildlife habitat and also distribute benefits for the affected people. Project activity should aim at rejuvenation of ecological goods and services like rebuilding soil fertility, pollination, seed dispersal, perennial stream flow, availability of fuelwood, fodder, fruits for the local people. Mechanism for ecological monitoring of CAMPA activities is to be developed. Use of latest field and information technology sources is highly recommended.

Chapter 6

RECOMMENDATIONS

Plantation activities

1. Development of Telangana State Site Quality Index (TSQX) based on climate variable, soil parameters, topography, land tenure, and degradation status for plantations.
2. Although from survival point of view, eucalyptus plantations obtained a better score yet avoidance of eucalyptus plantations as habitats by wildlife is a serious concern. It is recommended raising of local fast growing non timber forest products (NTFP) species for deriving multiple benefits for wildlife, human beings and rejuvenation of ecosystem services.
3. For raising teak plantation, planting stock of teak needs to be made from selected mother trees followed by proper root training of teak seedlings and acclimatization of the saplings before field transplantation with a ball of earth. Plantations to synchronize with the onset of monsoon. Sapling not less than 6ft in height should be field planted.
4. Keep updated plantation journals of all the CAMPA plantation activities in every ranges.
5. Eucalyptus not to replace natural teak growing areas.
6. Regular silvicultural practices for NTFP/NTSH and teak plantations to enhance the forest canopy.
7. Fast growing native NTFP/NTSH plantations should be raised for developing forest carbon sink.

Other activities

1. Plantation of native NTFP trees to join fragmented reserve forests for improving wildlife habitat and ensure ecosystem continuity.
2. Regular maintenance operations of soil and water conservation structures is necessary. Innovative low cost water harvesting structures like staggered trenches, *jaal kund* is better for treating catchments.
3. In areas frequented by wild herbivores, CPT be avoided to reduce the risk of wildlife accidents.
4. Maintenance of forest protection measures like chain link fencing in areas susceptible to severe grazing pressure is necessary.

5. Building trust among the forest fringe population on the benefits of stall-feeding for ecological benefits is a better way to reduce the grazing pressure.
6. Awareness programme for communities on the need for biodiversity conservation to enhance the perennial flow of ecosystem services is necessary.
7. All the activities undertaken under CAMPA is to be updated regularly in E-green watch for ease in conducting google earth based regular monitoring of activities.
8. Ecological monitoring of all the works on an annual basis is necessary.

General activities

1. Each division to update CAMPA list of works under each component as presently done for the year 2016-2017 in the FAMIS portal.
2. Training of officials on CAMPA components/sub-components for correct booking of works under the appropriate head/sub-head. A web based toolkit support system if available will assist forest officials to correctly book CAMPA works under the appropriate components.
3. Maintenance of record for all the activities is vital for proper monitoring of works. Irrespective of any situation measurement books / plantations journals should always be kept with care in the ranges where CAMPA works (*plantation and other activities*) have been carried out.
4. Adoption of recording CAMPA activities details grid wise. This is vital for ease in evaluating quantification of works.
5. Participatory selection of sites for CA plantations and CAMPA other activities in degraded lands with stakeholders for developing enhanced climate change resilient forests.