

Chapter 1

INTRODUCTION

1.1 About CAMPA

Forest land is generally diverted for non-forestry purpose under the relevant provisions of 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 Based on various parameters, the entity requiring diversion of forests has to deposit a proportionate amount with the State/U.T. In lieu of the funds collected by the States, Compensatory Afforestation Management and Planning Authority (CAMPA) was constituted by the Central government as ordered by the Hon. Supreme Court in 2002². The cost of creating the compensatory forest is borne by the 'User Agency' proposing the forest diversion for its project. The user agency can be a public or private sector enterprise or a government body owning the project. Whenever land inside a Reserved Forest or a Protected Area (PA), such as a wildlife sanctuary or a national park, is to be diverted, 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.³

The CAMPA functions under the supervision of the Ministry of Environment, Forests & Climate Change (MoEF&CC). GoI and 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)⁴. 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 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

² <http://envfor.nic.in/major-initiatives/compensatory-afforestation-fund-management-and-planning-authority-campa> ,
http://envfor.nic.in/sites/default/files/CAMPA-order-dated-13.8_0.pdf

³ CAMPA Fact Sheet: A Compromised Composition CAF Bill and PSC Report, CSE, 7p.

⁴ http://envfor.nic.in/sites/default/files/Guidelines_for_Investment_Policy_and_Procedure_0_0.pdf

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.⁵

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 have 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.⁶

CAMPA fund is to be used for assisted natural regeneration (ANR), natural forest management, forest protection, biodiversity conservation, infrastructure development, wildlife protection and management, the supply of wood and other forest produce saving devices and other allied activities.

⁵ 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.

⁶ Text of the Supreme Court Order, dated 10 July 2009, on National and State CAMPAs.

1.3 CAMPA in Telangana

Telangana state formed in June 2014 from the northwestern part of the State of Andhra Pradesh, has an area of 112,102 square kilometers and a population of 35,193,978.⁷ The notified forest area of the State is 26903.70 square kilometers, which is 23.99% of the geographical area.⁸ The Telangana State Forest Department (TSFD) is implementing CAMPA activities in the state of Telangana since 2009-2010.

³ Census of India (2011).

⁸ 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 2015-2016 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 2015-2016 are shown in Fig 2.0.

Fig 2.0: Works undertaken for different CA and NPV components during 2015-2016.

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 2015-2016, a total of 336 works were undertaken by TSFD with an expenditure of INR 710.431 lakhs. The major activities were carried out in Warangal and Hyderabad circle under CA funds. 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 2015-2016.

Name of the Circle	Name of the Division	No of works undertaken	Expenditure (lakhs)
Adilabad	Adilabad	27	15.3330
	Mancherial	1	0.5600
	Bellampally	25	78.9700
	Kaghaznagar	12	31.2930
	Circle-total	73	126.1560
Kawal TR	Nirmal	8	0.3260
	Circle-total	8	0.3260
Hyderabad	Hyderabad	1	0.2850
	Mahabubnagar	18	24.2430
	Nalgonda	82	176.0230
	Circle-total	101	200.551
Khammam	Khammam	4	6.38700
	Paloncha	16	18.59318
	Bhadrachalam (N)	8	30.76050
	Circle-total	28	55.74068
Nizamabad	Kamareddy	2	1.5300
	Medak	11	3.5000
	Circle-total	13	5.030
Warangal	Warangal (N)	59	165.3093
	Karimnagar (E)	41	77.4090
	Karimnagar (W)	3	3.3594
	Circle-total	103	246.078
Amrabad TR	Nagarujan Sagar	18	76.5500
	Circle-total	18	76.550
Grand total		336	710.431

Plantation targets and achievements under CA during 2015-2016 is shown in Fig 2.1a.

Fig 2.1a: Plantation raising targets and achievements under CA in 2015-16

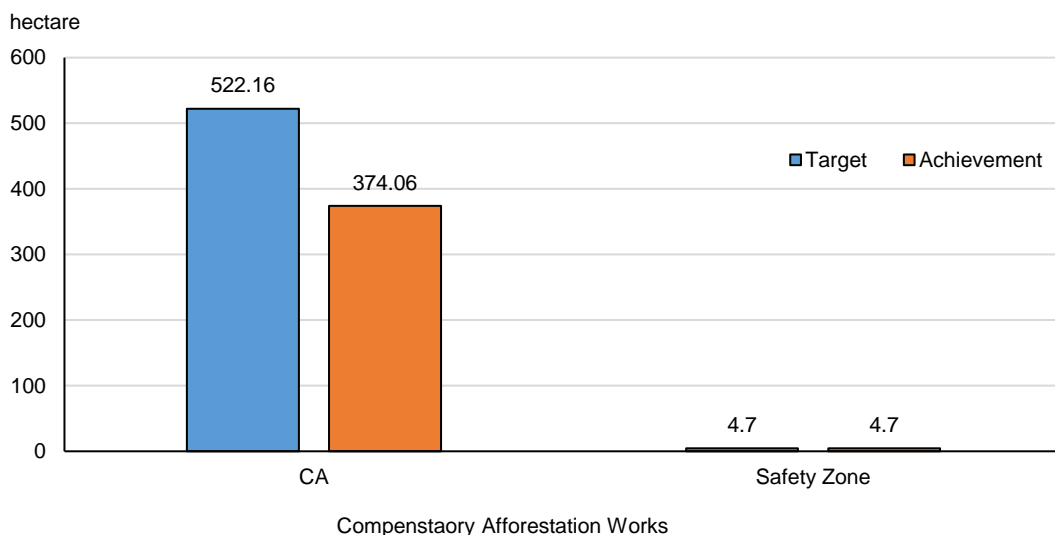
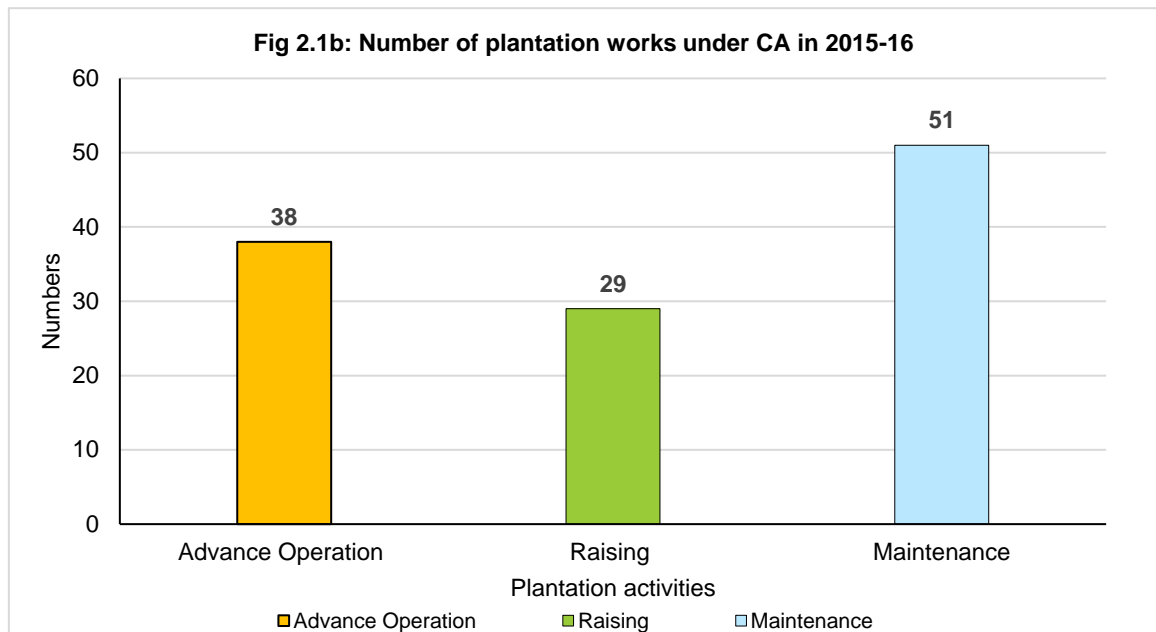


Table 2.1b: Division wise details of Target/achievement on plantation area (in ha) under CA by TSFD, CAMPA during the year 2015-2016.

Name of the Circle	Name of the Division	CA		Safety Zone		Total CA	
		Target	Achievement	Target	Achievement	Target	Achievement
Adilabad	Adilabad	-	-	-	-	-	-
	Nirmal	-	-	-	-	-	-
	Bellampally	-	-	4.7	4.7	4.7	4.7
	Mancherial	-	-	-	-	-	-
	Kaghaznagar	-	-	-	-	-	-
	Circle-total			4.7	4.7	4.7	4.7
Hyderabad	Hyderabad	-	-	-	-	-	-
	Mahabubnagar	30.33	-	-	-	30.33	-
	Nalgonda	133.16	133.16	-	-	133.16	133.16
	Circle-total	163.49	133.16	-	-	163.49	133.16
Khammam	Khammam	-	-	-	-	-	-
	Kothagudem	42.5	-	-	-	42.5	-
	Paloncha	48.86	48.86	-	-	48.86	48.86
	Bhadrachalam (N)	-	-	-	-	-	-
	WLM Paloncha	-	-	-	-	-	-
	Circle-total	91.36	48.86			91.36	48.86
Nizamabad	Nizamabad	-	-	-	-	-	-
	Kamareddy	-	-	-	-	-	-
	Medak	-	-	-	-	-	-
	Circle-total	-	-	-	-	-	-
Warangal	Warangal (N)	167	163.25			167	163.25
	Warangal (S)						
	Karimnagar (E)	97.43	25.91			97.43	25.91
	Karimnagar (W)	2.88	2.88			2.88	2.88
	Circle-total	267.31	192.04			267.31	192.04
Amrabad TR	Achampet	-	-	-	-	-	-
	Circle-total	-	-	-	-	-	-
Grand total		522.16	374.06	4.7	4.7	526.86	378.76



During 2015-2016, plantations under CA with area 526.86 ha was targeted, of which 378.76 ha was achieved under CA and 4.7 ha under safety zone, covering total plantation raised area 374.06, i.e. 71.89 % of target area proposed for plantation under CA in 2015-2016 .

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 2015-2016 is shown in Fig 2.1b. Division wise total number of plantation works under CA for the year 2015-2016 is shown in Table 2.1c.

Table 2.1c: Division wise total plantation works under CA by TSFD, CAMPA during 2015-2016.

Forest Divisions	Advance Operation	Raising	Maintenance	Total
Adilabad	3	-	2	5
Bellampally	2	-	-	2
Bhadrachalam (North)	5	-	3	8
Hyderabad	-	-	1	1
Kamareddy	-	-	2	2
Karimnagar East	3	2	8	13
Karimnagar West	-	2	-	2
Khammam	-	-	2	2
Mahabubnagar	1	1	2	4
Mancherial	-	-	1	1
Medak	-	-	2	2
Nagarjunasagar	1	-	1	2
Nalgonda	10	11	19	40
Nirmal	-	-	1	1
Paloncha	-	2	2	4
Warangal North	13	11	5	29
TOTAL	38	29	51	118

Under CA other activities, extraction of tree growth in diverted areas and development of soil and water conservation measures were undertaken during 2015-2016. Extraction of Bamboo, teak and Non-teak, poles and other fuel wood stock were extraction due to diversion of 38.90 ha in Garlapet RF of Kaghaznagar range. The main extraction activity under CA is carried out in Kaghaznagar followed by 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 2447.831 lakhs, including certain spillover activities of advance operations of 2014-2015, maintenance of nurseries and previous year raised plantations, advance operation for raising in 2016-2017 were spent during 2015-2016 under NFM component.

Division wise plantation raising targets and achievements under NFM for the year 2015-2016 is shown in Table 2.2.1.

Table 2.2.1a: Division wise plantation raising (ha) abstract of NFM under TSFD, CAMPA for the year 2015-2016.

Name of the Circle	Name of the Division	Teak		BHA		Bamboo + Misc. Spp		Bamboo + EP		NTSH (SMM)		NTSH (LIM)	
		Tar	Ach	Tar	Ach	Tar	Ach	Tar	Ach	Tar	Ach	Tar	Ach
Adilabad	Adilabad	20	20	20	20	10	5	-	-	50	50	30	35
	Nirmal	20	20	10	40	10	10	-	-	60	20	40	40
	Bellampally	20	20	20	20	10	10	-	-	40	40	30	30
	Mancherial	20	20			10	10	-	-	100	100	50	50
	Kaghaznagar	20	20	20	20	10	10	-	-	40	40	30	30
	Circle-total	100	100	70	100	50	45	-	-	290	250	180	185
Hyderabad	Hyderabad	-	-	-	-	-	-	-	-	53	53	-	-
	Mahabubnagar	-	-	-	-	-	-	-	-	30	30	-	-
	Nalgonda	-	-	-	-	-	-	-	-	30	30	-	-
	Circle-total	-	-	-	-	-	-	-	-	113	113		
Khammam	Khammam	-	-	-	-	100	157	400	232	-	-	-	15
	Kothagudem	20	30	-	-	-	-	712	356.5	50	10	-	95
	Paloncha	25	25	-	-	170	165	65	65	150	77	-	50
	Bhadrachalam (N)	-	-	-	-	-	-	50	40	85	60	-	-
	WLM Paloncha	-	-	-	-	-	50	-	-	50	-	-	-
	Circle-total	45	55			270	392	1227	693.5	335	147		160
Nizamabad	Nizamabad	-	-	-	-	-	-	-	-	-	-	110	110
	Kamareddy	66	66	-	-	-	-	-	-	-	-	55	40
	Medak	-	-	65	65	-	-	-	-	105	105	165	165
	Circle-total	66	66	65	65			-	-	105	105	330	315
Warangal	Warangal (N)	100	50	-	-	-	-	-	-	150	-	-	82
	Warangal (S)	50	50	-	-	-	-	-	-	-	-	100	100
	Karimnagar (E)	-	-	-	-	-	-	-	-	25	25	25	25
	Karimnagar (W)	-	-	-	-	-	-	-	-	25	25	50	50
	Circle-total	150	100	-	-	-	-	-	-	200	50	175	257
Amrabad TR	Achampet	-	-	60	60	-	-	-	-	100	100	-	-
	Circle-total	-	-	60	60	-	-	-	-	100	100	-	-
Grand total		361	321	195	225	320	437	1227	693.5	1143	765	685	917

Targets and achievements of different types of plantation for the year 2015-2016 are shown in Fig 2.2.1a.

Fig 2.2.1a: Targets and achievements of NFM plantations area during 2015-2016

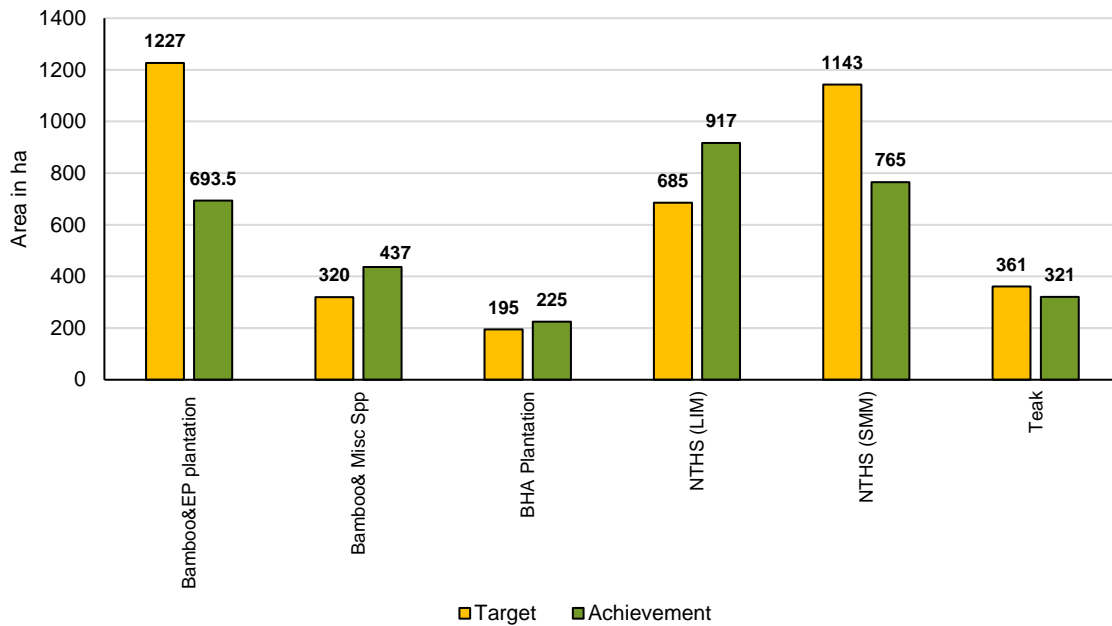
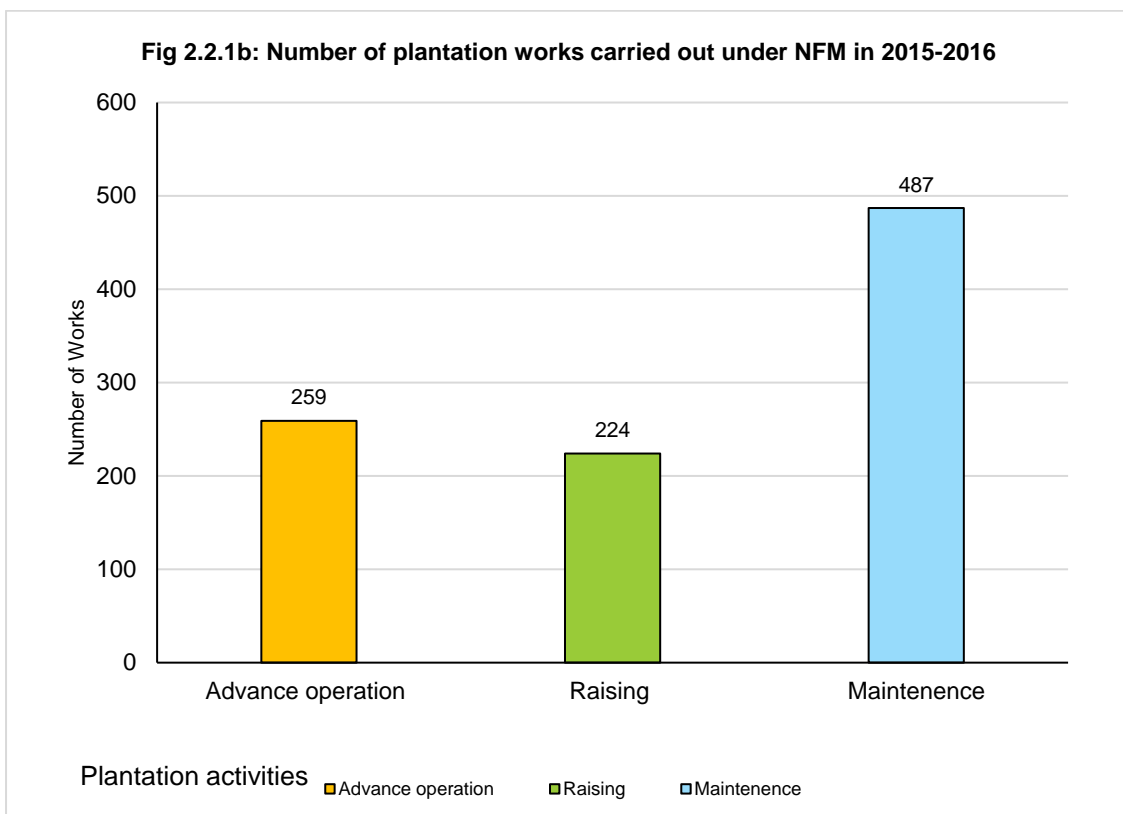


Table 2.2.1b: Division wise details of number of works and financial expenditure (lakhs) of NFM under TSFD, CAMPA for the year 2015-2016

Name of the Circle	Name of the Division	No of Works	Expenditure (lakhs)
Adilabad	Adilabad	54	60.3605
	Nirmal	86	91.7040
	Jannaram WL	2	1.9890
	Mancherial	85	194.8850
	Bellampally	73	120.2410
	Kazagnagar	70	128.6600
	Circle-total	370	597.8395
Hyderabad	Hyderabad	45	75.2809
	Mahabubnagar	33	49.4628
	Nalgonda	33	44.9916
	Circle-total	111	169.7354
Khammam	Khammam	103	278.52490
	Kothagudam	144	304.14600
	Paloncha	111	259.74183
	Bhadrachalam (N)	46	105.65504
	WL Paloncha	29	56.75863
	Circle-total	433	1004.82640
Nizamabad	Nizamabad	34	66.8589
	Kamareddy	56	58.9270
	Medak	85	164.5177
	Circle-total	175	290.3036
Warangal	Warangal (N)	30	62.4606
	Warangal (S)	80	94.8074
	Karimnagar (E)	54	92.6200
	Karimnagar (W)	59	78.4890
	Circle-total	223	328.3770
FDPT	Achampet	25	56.6210
	N.Sagar (G)	1	0.1282
	Circle-total	26	56.7492
Grand total		1338	2447.831

Under NFM during 2015-2016 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 321 ha of teak plantations including cultural operations, decongestion of soil and moisture conservation works, fire tracing, raising & maintenance.
- Raising of 693.5 ha of Bamboo & Eucalyptus mix plantations
- Raising of 437 ha of Bamboo and Miscellaneous species
- Barren hills afforestation in 225 ha with forest species indigenous non-teak secondary hardwood species.
- Raising of 917 ha of NTSH plantations using Labour Intensive Method (LIM)
- Raising of 765 ha of NTSH plantations using Semi-Mechanical Method (SMM)



Division wise total number of plantation works under NFM for the year 2015-2016 is shown in Table 2.2.1b.

Table 2.2.1b: Total plantation works undertaken under NFM by TSFD, CAMPA during 2015-2016.

Forest Divisions	Advance Operation	Raising	Maintenance	Total
Achampet	7	9	6	22
Adilabad	7	6	31	44
Bellampally	11	5	39	55
Bhadrachalam (North)	11	7	16	34
FG Warangal	3	3	13	19
Jannaram WL	-	1	1	2
Hyderabad	10	-	33	43
Kaghaznagar	8	7	36	51
Kamareddy	8	9	7	24
Karimnagar East	13	4	33	50
Karimnagar West	14	8	24	46
Khammam	28	40	10	78
Kothagudem	31	24	33	88
Mahabubnagar	10	-	23	33
Mancherial	10	12	33	55
Medak	19	14	23	56
Nagarjunasagar	-	-	1	1
Nalgonda	7	3	11	21
Nirmal	4	7	45	56
Nizamabad	4	9	3	16
Paloncha	26	22	17	65
Paloncha WL	18	1	-	19
SS Hyderabad	-	-	6	6
Warangal North	3	12	10	25
Warangal South	7	19	29	55
Warangal WLM	-	2	4	6
TOTAL	259	224	487	970

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 2064.20 lakh was spent for completing the proposed interventions, the amount also includes spillover works of the year 2014-15. Activities carried out under FP during 2015-2016 include:

- Establishment of Base Camps (144 base camps) activities with highest in Khammam and Warangal (28 base camps) each.
- Forest Strike Forces (62nos) activities towards establishment and maintenance with highest activities in Warangal (15 nos).
- Maintenance of Check posts (57 nos) with highest in Khammam and KTR (13 check post) each.

- Communication charges for 2551 personnel highest in Khammam circle (574 case).
- Construction of boundary pillars (1404 Nos) with highest in Nizamabad circle (831 nos)
- Hiring and operation of boat parties (1no) in Achampet division only.
- Seizures safeguarding / feeding of accused (20cases) highest in Khammam circle (15 cases)
- Improvements to the Residential Quarters of Frontline staff (13 Nos) with highest in Warangal circle (7 nos)
- Improvement of Camping facilities to the Field Officers to supervise protection of Forest & Wildlife/ Repairs and replacements to old buildings (6 no) highest in Nizamabad circle (4 nos).
- Legal charges and charges to legal consultants (6 nos) highest in Khammam circle with 5 numbers.
- POL and Maintenance of Vehicles of FROs/ ACFs and Sub-DFOs (84 nos) with highest in Adilabad circle (25 nos)
- Wages of drivers (119 nos) with highest in Adilabad circle (38 nos)

Table 2.2.2a: Division wise details of main activities under Forest protection by TSFD, CAMPA during 2015-2016.

Sl No	Name of the Circle	Name of the Division	Base Camps	Strike Forces	Check Posts	Communication Charges
1	Adilabad	Adilabad	8	4	4	100
		Mancherial	5	2	2	87
		Bellampally	4	2	2	100
		Kaghaznagar	6	2	1	73
		Circle total	23	10	9	360
2	KTR	Nirmal	11	5	6	125
		WL Jannaram	14	3	7	139
		Circle total	25	8	13	264
3	Hyderabad	Hyderabad	2	2	0	99
		Mahabubnagar	0	1	0	69
		Rangareddy	0	0	0	0
		Nalgonda	1	1	0	34
		Circle total	3	4	0	202
4	WLM Hyderabad	DFO WLM Hyd	1	1	1	4
		Curator, NP	2	0	0	14
		NZP Hyderabad	0	0	0	0
		Circle total	3	1	1	18
5	Khammam	Khammam	8	4	5	156
		Kothagudam	9	3	3	160
		Paloncha	3	3	1	84
		Bhadrachalam (N)	3	2	1	125
		WL Paloncha	5	2	3	49
		Circle total	28	14	13	574
6	Nizamabad	Nizamabad	3	3	0	104
		Kamareddy	2	3	1	110
		Medak	2	0	4	112
		WL Medak	4	0	0	28
		Circle total	11	6	5	354
7	Warangal	WL Warangal	5	1	5	60
		Warangal (N)	6	3	3	167
		Warangal (S)	4	4	3	130
		Karimnagar (E)	7	4	1	124
		Karimnagar (W)	6	3	0	139
		Circle total	28	15	12	620
8	Amrabad TR	Achampet	20	3	3	139
		N.Sagar	3	1	1	20
		Total	23	4	4	159
GRAND TOTAL			144	62	57	2551

Division wise targets and achievements under FP for the year 2015-2016 is shown in Table 2.2.2b.

Table 2.2.2b: Division wise physical works (numbers) and expenditure (lakhs) abstract of FP under TSFD, CAMPA for the year 2015-2016.

Name of the Circle	Name of the Division	Physical(Nos)	Financials	
			Sanctioned (lakhs)	Expenditure (lakhs)
Adilabad	Adilabad	63	94.4440	93.8080
	Nirmal	60	158.3940	135.7860
	WL Jannaram	135	180.2690	136.4600
	Mancherial	22	66.4290	62.8210
	Bellampally	9	75.4590	66.8540
	Kazagnagar	29	71.3220	58.2000
	Circle total	318	646.317	553.929
Hyderabad	Hyderabad	42	223.4910	170.2518
	Mahabubnagar	26	38.7940	54.1739
	Nalgonda	12	40.3690	29.3579
	Circle total	80	302.654	253.7836
Khammam	Khammam	24	121.2020	90.81979
	Kothagudam	50	117.9180	107.45800
	Paloncha	23	67.1810	56.15017
	Bhadrachalam (N)	25	54.2140	42.29171
	WL Paloncha	27	69.8550	64.07550
	Circle total	149	430.3700	360.79517
Nizamabad	Nizamabad	38	120.3770	108.3862
	Kamareddy	35	85.5360	60.5072
	Medak	32	85.7620	74.5190
	WL Medak	14	28.7060	26.6710
	Circle total	119	320.3810	270.0834
Warangal	Warangal (N)	43	81.7530	93.6576
	Warangal (S)	36	86.2160	70.9320
	WL Warangal	19	49.9780	45.4080
	Karimnagar (E)	46	115.2530	110.6800
	Karimnagar (W)	29	82.2280	83.9140
	Circle total	173	415.42800	404.5916
FDPT	Achampet	72	204.0800	160.79100
	N.Sagar (G)	15	34.4250	24.27538
	Circle total	87	238.50500	185.06638
WLM Hyd	CNP	4	9.6250	9.43200
	D.F.O	4	16.6560	14.47000
	Circle total	8	26.2810	23.90200
Zoo Park	Zoo Park	1	14.4300	12.05768
	Circle total	1	14.4300	12.05768
GRAND TOTAL		935	2394.366	2064.20879

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 115.724 lakh was spent on interventions under this component. Major activities under FFM during 2015-2016 include:

- Creation of fire lines (104 km) and maintenance of existing fire lines (605km)
- Fire watchers (for 4 months in a year during fire season) 249 watchers.
- Construction of Fire Watch Towers (3 nos) (areas in highly vulnerable to fire risk) highest in Karimnagar West (2 nos)

Division wise targets and achievements under FFM for the year 2015-2016 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 2015-2016.

Name of the Circle	Name of the Division	Physical (nos)	Financial	
			Sanctioned (lakhs)	Expenditure (lakhs)
Adilabad	Adilabad	5	3.5100	3.2900
	Mancherial	4	2.3400	1.8760
	Kaghaznagar	4	4.6800	4.0090
	Nirmal	17	23.4500	10.6760
	WL Jannaram	11	32.1120	21.8870
	Bellampally	12	4.6800	1.9500
	Circle total	53	70.772	43.688
Hyderabad	Hyderabad	11	3.0720	3.0700
	Mahabubnagar	9	2.8080	1.6850
	Circle total	20	5.8800	4.7550
Khammam	Kothagudam	3	1.1700	1.0320
	Paloncha	3	1.4040	0.4020
	Bhadrachalam (N)	1	2.3400	2.0100
	WL Paloncha	2	0.9360	0.9360
	Circle total	9	5.8500	4.3800
Nizamabad	Nizamabad	10	3.5100	1.2820
	Kamareddy	16	4.6800	2.6140
	Medak	1	7.0200	4.0500
	WL Medak	1	1.9290	2.2730
	Circle total	28	17.1390	10.2190
Warangal	Warangal (N)	5	6.9900	6.0300
	Warangal (S)	5	2.8080	2.4120
	WL Warangal	1	6.5020	0.5360
	Karimnagar (E)	7	8.5100	6.7050
	Karimnagar (W)	2	6.8080	4.0000
	Circle total	20	31.61800	19.6830
Amrabad TR	Achampet	30	49.5000	23.1150
	N.Sagar (G)	7	9.0760	5.1222
	Circle total	37	58.57600	28.2372
WLM Hyd	CNP	2	4.7440	3.8910
	DFO	2	1.8720	0.8710
	Circle total	4	6.616	4.7620
Grand total		171	196.451	115.724

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 2015-2016 an expenditure of 1172.153 lakhs was made by TSFD. Initiatives for the conservation of biodiversity and development in the National Parks and Protected Areas undertaken by TSFD during 2015-2016 are listed below:

- Wild Life Extension and Education – Maintenance of Old / New hoardings/construction .of store rooms(13 works) highest in Adilabad circle (11 works)
- Wild Life Extension and Education -Improvement / Maintenance of EECs(6 works), highest in Kawal TR (3 works)
- Wild Life Extension and Education - Exhibitions and Nature Camps (13 works), highest in Hyderabad circle(6 works)

- Animal Conservation Breeding Programme., ex-situ facilities & its rehabilitation ,Protection & Maintenance (17 works) highest in Hyderabad circle (8 works)
- Animal Conservation Breeding Program., ex-situ facilities & its rehabilitation - Feed & Fodder facilities for CB Centre (15 works) highest in Hyderabad circle (13 works)
- Animal Conservation Breeding Program., ex-situ -situ facilities & its rehabilitation - Veterinary care for animals at CB Centre (2 works)
- Research & Data collection - Data collection under periodical estimation
- Research & Data collection - Purchase & Maintenance of camera traps (18 works) in Kawal tiger reserve.
- Total of WEE, Animal Conservation, Research & Data & WL Prominence areas (87 works) highest in Kawal Tiger reserve (28 works).

Division wise targets and achievements under BDC for the year 2015-2016 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 2015-2016.

Circle	Divisions	Physical (nos)	Financials	
			Sanctioned (lakhs)	Expenditure (lakhs)
Adilabad	Adilabad	2	5.0500	3.69600
	Mancherial	15	24.3860	22.58600
	Bellampally	0	3.0000	0.00000
	Kaghaznagar	9	28.6500	22.85000
	Nirmal	51	15.0000	44.61000
	WL Jannaram	135	107.6290	145.60400
	Circle total	212	183.715	239.3460
Hyderabad	Hyderabad	24	60.0000	47.03910
	Mahabubnagar	13	36.3240	36.75705
	Circle total	37	96.324	83.7962
Khammam	Bhadrachalam (S)	0	0	0
	WL Paloncha	49	94.7600	81.57142
	Circle total	49	94.7600	81.57142
Nizamabad	Nizamabad	24	8.4700	5.23400
	Kamareddy	33	10.3451	8.36700
	Medak	4	19.9400	11.38700
	WL Medak	93	132.9251	114.60000
	Circle total	154	171.6802	139.58800
Warangal	Warangal (N)	0	0	0
	Warangal (S)	0	0	0
	WL Warangal	140	155.6460	126.05200
	Karimnagar (W)	17	32.1640	31.13700
	FSP Warangal	0	0	0
	Circle total	157	187.81000	157.1890
FDPT	Achampet	144	185.3000	101.55800
	Nagarjunasagar (G)	29	56.0400	42.65121
	Circle total	173	241.34000	144.2092
WLM Hyderabad	CNP	84	255.7430	247.22500
	D.F.O	51	88.0540	71.23300
	Circle total	135	343.7970	318.45800
Zoo Park	Zoo Park	3	27.1700	7.99561
	Circle total	3	27.1700	7.99561
	Grand total	920	1346.596	1172.153

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 145.774 lakhs was spent under this component during 2015-2016. The major interventions includes

- Improvement of Nursery Technology - Maintenance works in nursery & Services of one Research Assistant in NFM trials
- NFM - Impact of clump management
- Conservation of Eastern Ghats -collection and preparation Maintenance & expansion of Arboretums.
- Conservation of Eastern Ghats - research assistant to be engaged/maintenance of bio park/Assistance of a field assistant to the research
- Special Research Topics - Analysis of MLCT Plots/Reclamation of recalcitrant
- Special Research Topics - Growth data documentation of LRHT Plots/development of thinning models
- Maintenance of Research Plots, data capturing etc. - Maintenance 2nd and 3rd year plantations
- Maintenance of Research Plots, data capturing etc. - Data capturing
- Lab chemicals and glass ware
- Patrolling charges / Contingencies

Division wise targets and achievements under R&D for the year 2015-2016 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 2015-2016.

Name of the Circle	Name of the Division	Physical (nos)	Financial	
			Sanctioned (lakh)	Expenditure (lakhs)
	SS Hyd	55	61.82000	61.78080
	FG WGL	108	81.12900	83.99357
Grand total		163	142.949	145.774

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 307.486 lakhs is provided under the component for the following activities:

- Infrastructure for Capacity Building - Construction of 1st floor and Auditorium for Hostel Building
- Infrastructure for Capacity Building -Internal furnishing of hostel rooms.
- Trainings, Workshops, Study tours & Publications Proposed - Off campus programmes - Training and capacity building for Forest Staff and other Stakeholders.
- Trainings, Workshops, Study tours & Publications Proposed - Off campus programmes - Circle level 3 days programme including. Training support services.
- Trainings, Workshops, Study tours & Publications Proposed - In campus programmes - 20 members for 3 days each @ Rs.1432 per participant per day including TSS & Rs. 567/- Training Grant per participant)
- Trainings, Workshops, Study tours & Publications Proposed - Workshops and Seminars.

- Trainings, Workshops, Study tours & Publications Proposed - Expenditure on FSOs/FBOs under training - FSOs undergoing training - Study tours of FSOs, Conduction of examinations and Conducting of Convocation
- Trainings, Workshops, Study tours & Publications Proposed - FBO/FRO/FSO Training - Specialized Trainings - Weapon training
- Trainings, Workshops, Study tours & Publications Proposed - FBO/FRO/FSO Training - Specialized Trainings - Jeep Driving
- Trainings, Workshops, Study tours & Publications Proposed - FBO/FRO/FSO Training - Specialized Trainings -Long term Induction Training courses.

Division wise targets and achievements under CB for the year 2015-2016 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 2015-2016.

Name of the Circle	Name of the Division	Physical (nos)	Financial	
			Sanctioned (lakhs)	Expenditure (lakhs)
APFP Dullapally	Dullapally	104	349.63700	307.48600
Grand total		104	349.63700	307.48600

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 313.300 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 2015-2016 includes:

- Systems and Network maintenance - Data Processing Officer (AP & TG)
- Systems and Network maintenance -Project Scientist Grade I as systems and Network Administrator
- Systems and Network maintenance -Electronic Equipment maintenance Operators
- Survey of notified forest blocks including generation of latitude and longitude using notifications, cadastral maps and area statement (outsourcing Part)
- Survey of old FCA areas
- Cost of Brochures, Books, News Letter, Manuals etc
- Technical Committee on various IT - Activities/ Customization of Arc GIS Server
- Improvement of Infrastructure and communication -Improving Communication Infrastructure - Internet connection for O/o PCCF (HoFF)
- Improvement of Infrastructure and communication -Procurement of IT infrastructure for FMIS and e-green Watch - Procurement of Mobile Phones up to FBO
- Improvement of Infrastructure and communication -Procurement of IT infrastructure for FMIS and e-green Watch - Video Conferencing

- Improvement and Maintenance of IT infrastructure for FMIS and e-green watch - Maintenance of Internet Connectivity, hardware, peripherals, plotters, UPS etc - Internet Connection for O/o PCCF (HoFF)
- Improvement and Maintenance of IT infrastructure for FMIS and e-green watch - Maintenance of Internet Connectivity, hardware, peripherals, plotters, UPS etc - 3 No's HP Plotters + 1 No's HP CLJ A3 Printer + 1 Xerox CLJ A3 Printer
- Improvement and Maintenance of IT infrastructure for FMIS and e-green watch - Maintenance of Internet Connectivity, hardware, peripherals, plotters, UPS etc - Miscellaneous expenditure

Table 2.2.7: Division wise ICT works (numbers) and expenditure (lakhs) during the year 2015-2016

Circle	Divisions	Physical (Nos)	Financial	
			Sanctioned (lakhs)	Expenditure (lakhs)
Adilabad	Adilabad	8	11.80600	11.71500
	Nirmal	14	12.56500	12.59900
	WL Jannaram	23	7.58600	7.97300
	Mancherial	6	10.14100	9.77100
	Bellampally	4	10.16900	10.12100
	Kazagnagar	8	8.50200	8.62000
	Circle total	63	60.769	60.7990
Hyderabad	Hyderabad	5	14.87600	16.95512
	Mahabubnagar	5	8.34700	7.98259
	Nalgonda	4	4.72800	4.77122
	Circle total	14	27.951	29.7089
Khammam	Khammam	6	10.15400	8.78354
	Kothagudam	12	11.72800	12.25900
	Paloncha	9	9.47600	10.10367
	Bhadrachalam (N)	6	8.06300	7.82510
	WL Paloncha	5	5.50100	5.89832
	Circle total	38	44.92200	44.86963
Nizamabad	Nizamabad	4	8.47300	7.66900
	Kamareddy	8	8.50200	8.28450
	Medak	14	13.45800	12.64680
	WL Medak	2	1.82700	1.62200
	Circle total	28	32.26000	30.22230
Warangal	Warangal (N)	15	12.48600	12.08300
	Warangal (S)	8	9.80900	8.58800
	WL Warangal	5	5.03400	4.55200
	Karimnagar (E)	14	11.80600	10.92500
	Karimnagar (W)	9	12.63800	12.09900
	Circle total	51	51.77300	48.2470
FDPT	Achampet	8	10.26000	8.30600
	Nagarjunasagar	4	2.94600	2.74032
	Circle total	12	13.20600	11.0463
WLM Hyd	CNP	3	3.53700	3.50550
	D.F.O	2	1.73000	1.35500
	Circle total	5	5.267	4.8605
I&TC	I&TC	20	187.17400	83.54600
	Circle total	20	187.17400	83.54600
GRAND TOTAL		231	423.322	313.300

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

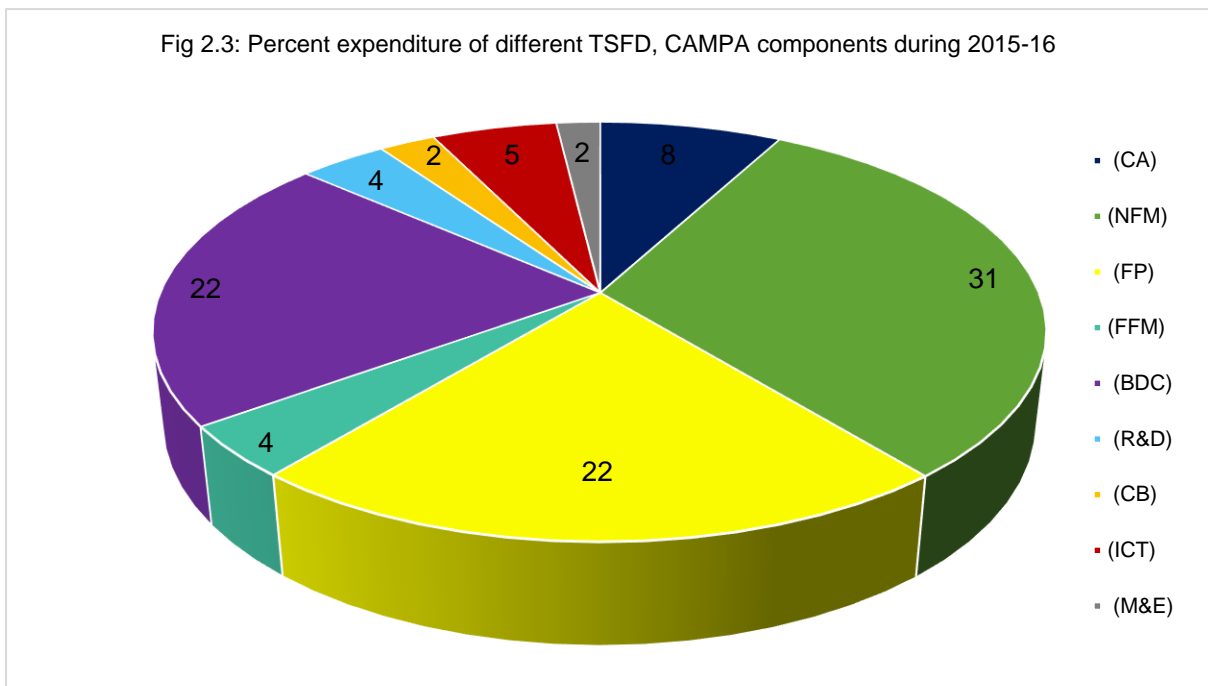
of CAMPA through Evaluation by the third party is proposed in 2015-2016 for effective implementation of CAMPA scheme. The CAMPA guidelines also prescribe utilization of 2% of the Annual outlay for Monitoring and Evaluation component in the APO. An amount of 28.901 lakhs has been spent. Division wise targets and achievements under M&E for the year 2015-2016 is shown in Table 2.2.8. Major monitoring and evaluation activities during 2015-2016 include:

- CA Audit fees for external audit
- Office support for monitoring CAMPA
- Monitoring and Evaluation/ Bank charges

Table 2.2.8: Division wise physical works (numbers) and expenditure (lakhs) abstract of M&E under TSFD, CAMPA for the year 2015-2016.

Circle	Divisions	Physical (nos)	Financial	
			Sanctioned (lakhs)	Expenditure (lakhs)
Adilabad	Adilabad	2	1.76	1.930
	Nirmal	1	0.75	0.725
	WL Jannaram	6	2.00	2.062
	Mancherial	3	0.84	0.844
	Bellampally	1	0.25	0.751
	Kazagnagar	2	0.74	0.752
	Circle total	15	6.34	7.064
Hyderabad	Hyderabad	4	3.00	1.801
	Mahabubnagar	4	0.76	0.695
	Nalgonda	2	0.80	0.789
	SS Hyd	1	0.80	0.212
	Circle total	11	5.356	3.497
Khammam	Khammam	7	2.60	2.52449
	Kothagudam	3	0.80	0.78850
	Paloncha	2	0.80	0.80300
	Bhadrachalam (N)	0	0.80	0.75765
	WL Paloncha	4	0.80	0.76013
	Circle total	16	5.80	5.63377
Nizamabad	Nizamabad	7	1.95	1.95000
	Kamareddy	2	0.75	0.72500
	Medak	3	0.95	1.00000
	WL Medak	1	0.78	0.72500
Circle total	13	4.43	4.40000	
Warangal	Warangal (N)	6	1.96	1.95659
	Warangal (S)	4	0.80	0.76195
	WL Warangal	2	0.80	0.44635
	Karimnagar (E)	2	0.65	0.65300
	Karimnagar (W)	2	0.65	0.66200
	Circle total	16	4.856	4.47989
FDPT	Achampet	3	2.10	0.498
	N.Sagar (G)	2	0.80	0.143
	Circle total	5	2.900	0.641
WLM Hyd	CNP	2	2.13	1.899
	D.F.O	2	0.66	0.661
	Circle total	4	2.79	2.560
Zoo Park	Zoo Park	1	0.40	0.625
	Circle total	1	0.40	0.625
ITC	ICT, Hyd	0	0.30	0.000
	Circle total	0	0.30	0.000
GRAND TOTAL		81	33.171	28.901

2.3 Targets and Achievements of CAMPA components during 2015-2016: 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 2015-16 under Telangana State CAMPA. 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 2015-2016.

CAMPA Components	Physical (nos)	Financial	
		Sanctioned (lakhs)	Expenditure (lakhs)
Compensatory Afforestation (CA)	336	1136.277	710.431
Natural Forest Management (NFM)	1338	3339.756	2447.831
Forest Protection (FP)	923	2394.366	2064.20879
Forest Fire Management (FFM)	171	196.451	115.724
Biodiversity Conservation and Development (BDC)	920	1346.596	1172.153
Research & Development (R&D)	163	142.949	145.774
Capacity Building (CB)	104	349.637	307.486
Information & Communication Technology (ICT)	231	423.322	313.300
Monitoring & Evaluation (M&E)	81	33.171	28.901
TOTAL	4267	9362.525	7305.80879

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.⁹

⁹AP State CAMPA, APO for the year 2015-2016, 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.¹⁰ 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-2014¹¹ 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 2015-2016.
2. To evaluate the survival and health of plantations carried out under the CAMPA Scheme in Telangana State Forest department for the year 2015-2016 with photographic evidence.
3. To evaluate the other activities carried out by Telangana State Forest Department for the year 2015-2016 with photographic evidence.

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

¹¹National 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.

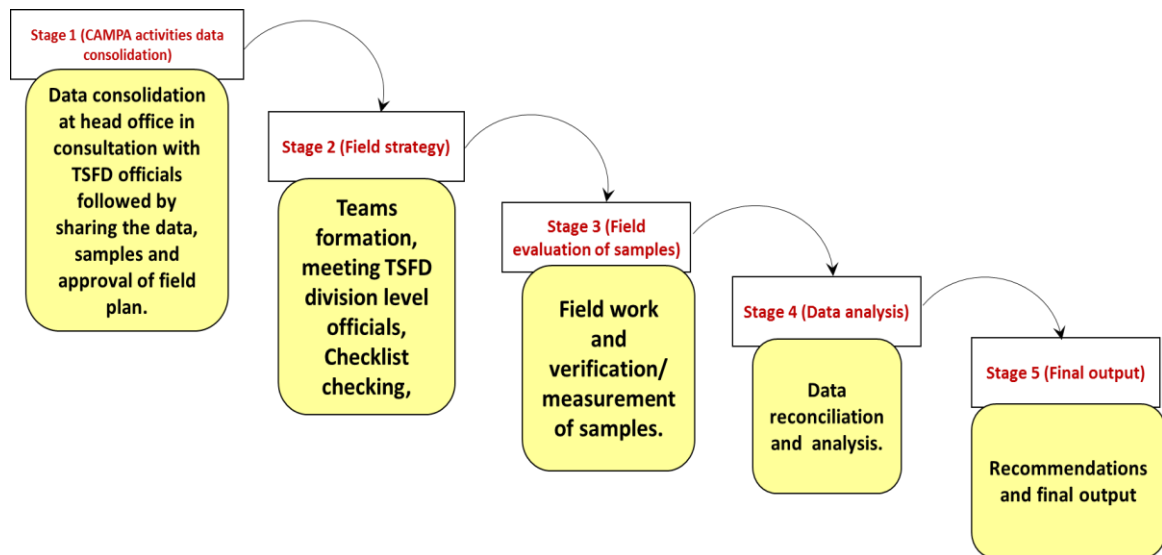


Fig 4.1: Process flow of third party CAMPA evaluation.

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).

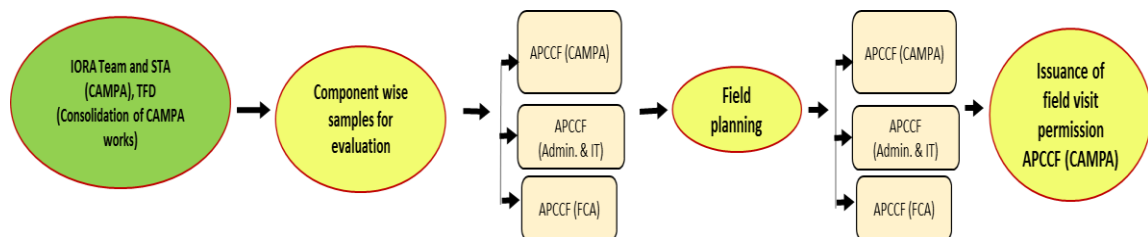


Fig 4.1.1: Flow chart of Stage 1 - CAMPA activities data consolidation.

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 2015-2016. The list of data sources reviewed for consolidation of CAMPA list of works for 2015-2016 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 2015-2016
 - 5) List of works 2015-2016 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 2015-2016 was collected. A total of 4279 works (*Part B*) were undertaken in the state of Telangana under CAMPA during 2015-2016. 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 2015-2016. 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 available¹².

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

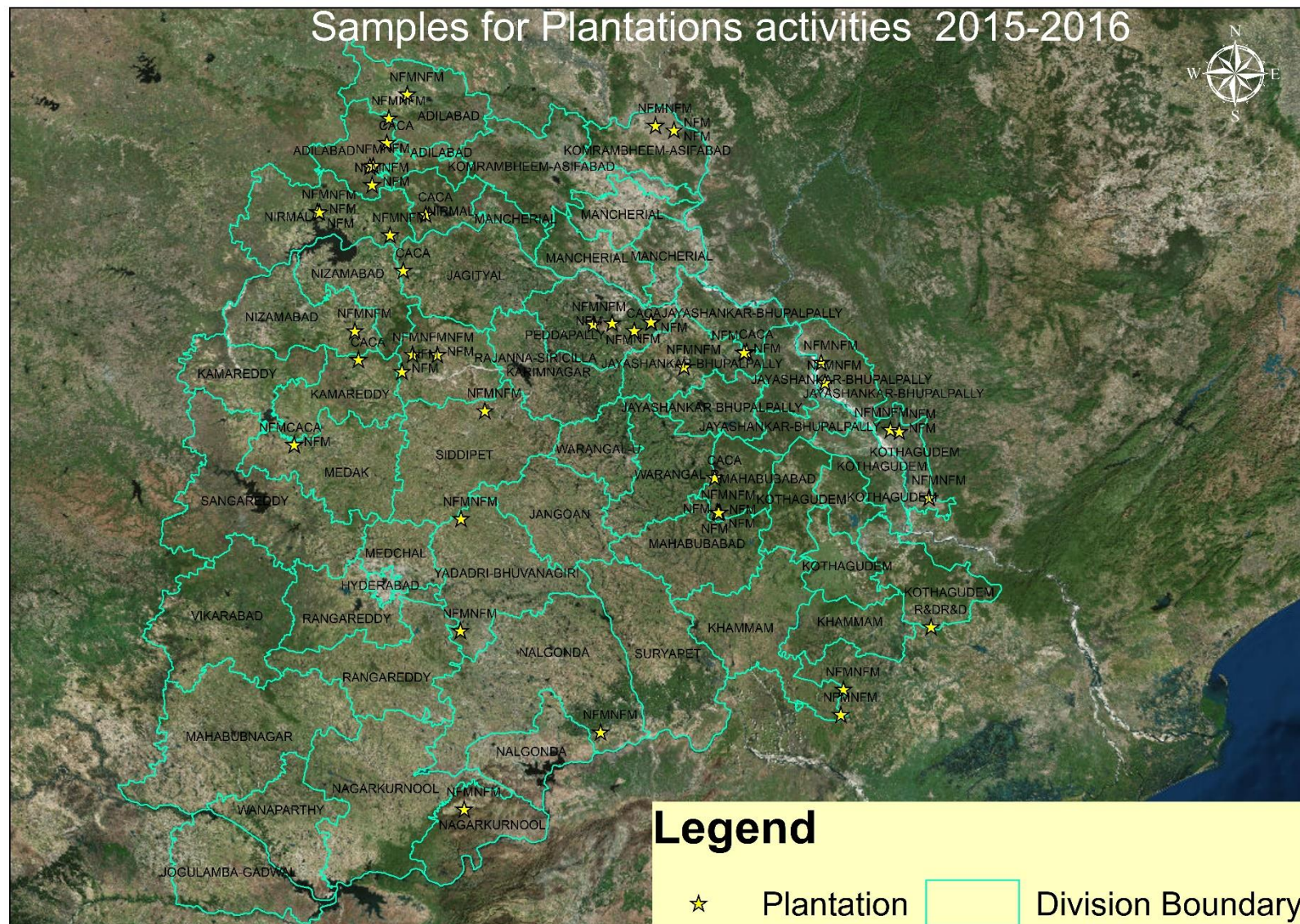
¹²National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

field enumeration adhering NWPC-2014 guidelines. The detail sample list (109 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 (2015-2016) for 3rd party evaluation.

Forest Divisions	Advance Operation		Raising		Maintenance		Total
	CA	NFM	CA	NFM	CA	NFM	
Achampet	1	2	-	1	-	-	4
Adilabad	3	1	-	-	-	1	5
Amrabad	-	-	-	-	-	1	1
Armoor	-	-	-	-	-	-	0
Boath	-	2	-	-	-	-	2
Banswada	-	-	-	1	-	-	1
Bellampally	-	1	-	1	-	-	2
Bhupalpally	-	2	2	-	1	2	7
Bhadrachalam (N)	-	-	-	-	-	2	2
Chennur	-	2	-	-	-	-	2
Echoda	1	1	-	1	1	4	8
Warangal (U)	-	-	-	-	-	1	1
Jagtial	-	-	-	-	1	-	1
Kaghaznagar	-	-	-	1	-	2	3
Kamareddy	-	2	-	-	1	-	3
Khammam	-	-	-	1	-	2	3
Kothagudem	-	3	-	2	-	-	5
Khanapur	-	-	-	-	1	-	1
Mancherial	-	2	-	-	-	-	2
Mahabubnagar	-	2	-	-	-	-	2
Medchal	-	-	-	-	-	-	0
Mahbubabad	-	2	-	1	-	4	7
Medak	-	2	-	-	-	1	3
Nagarujan Sagar WLM	-	-	-	-	-	-	0
Nalgonda	-	-	-	-	-	1	1
Nirmal	-	-	-	-	-	3	3
Nizamabad	-	-	-	1	-	1	2
Paloncha	-	2	-	1	-	-	3
Peddapally	-	-	-	1	1	4	6
Rangareddy	-	-	-	-	-	-	0
Sangareddy	-	-	-	2	-	-	2
Sathupally	-	-	-	1	-	-	1
Siddipet	-	1	-	-	-	1	2
Sircilla	-	-	1	-	-	3	4
SS Hyderabad	-	-	-	-	-	-	0
Shamshabad	-	-	-	-	-	-	0
Utnoor	-	3	-	2	-	-	5
Venkatapuram	-	2	-	1	-	2	5
Vikarabad	-	1	-	-	-	-	1
Wanaparthy	1	-	1	-	-	-	2
Warangal Rural	-	-	1	-	1	-	2
WLM Hyderabad	-	-	-	1	-	-	1
Yadadri	-	-	-	-	1	2	3
Yellandu	-	-	-	1	-	-	1
TOTAL	6	33	5	20	8	37	109

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

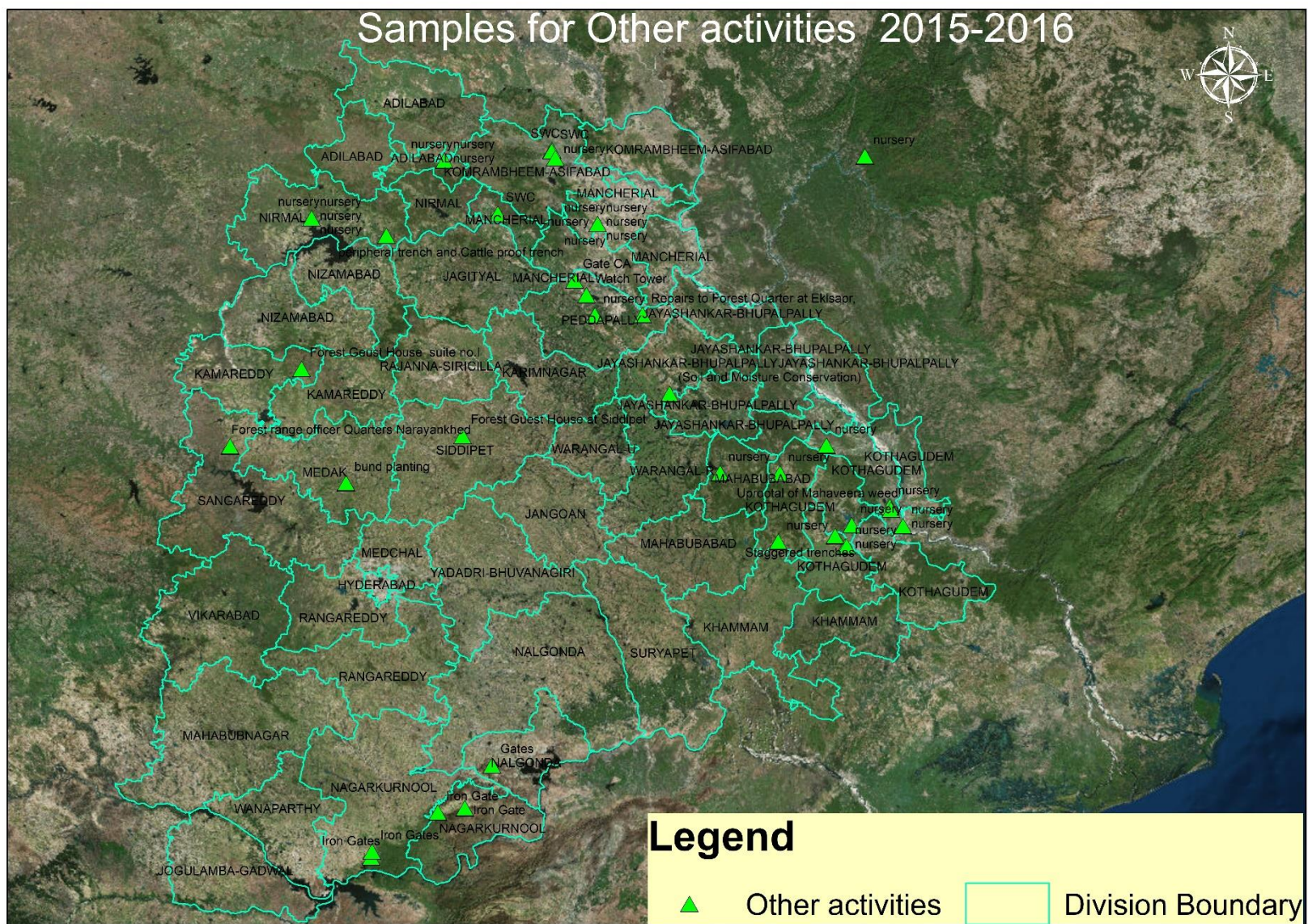


4.1.1.1.2 Sampling of other activities: For sampling other activities, the consolidated list of works of all the other activities undertaken by TSFD CAMPA during the year 2015-2016 was sorted. The sorted list was segregated into different CAMPA components. Sampling design tool, an add-on of ArcGIS 10.3 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 (320 nos) of other activities is given in Annexure V. Division wise number of samples of other activities under different CAMPA components namely, CA, NFM, FP, FFM, BDC, ICT, M&E, R&D, and CB are 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 2015-2016.

Division	CA	NFM	FP	FFM	BDC	ICT	R&D	CB	M&E	Total
Achampet	-	-	12	5	6	3	-	-	-	26
Adilabad	2	-	6	1	2	2	-	-	1	14
Amrabad	-	2	8	2	10	1	-	-	-	23
Armoor	-	-	-	-	-	-	-	-	-	0
Asifabad	4	1	-	-	-	-	-	-	-	5
Banswada	-	1	3	1	2	-	-	-	-	7
Bellampally	3	6	2	-	-	1	-	-	1	13
Bhadrachalam	-	2	-	-	-	1	-	-	-	3
Bhupalpally	1	-	4	-	-	1	-	-	-	6
Chennur	2	1	6	2	-	-	-	-	2	13
Echoda	-	-	1	-	-	1	-	-	-	2
FG Warangal	-	-	-	-	-	-	12	-	-	12
Hyderabad	-	-	-	-	1	-	-	-	-	1
ICT Hyderabad	-	-	-	-	-	3	-	-	-	3
Jagitial	-	-	-	-	-	1	-	-	-	1
Jannaram	1	-	2	1	12	2	-	-	-	18
Kothagudem	2	5	5	-	-	-	-	-	-	12
Kaghaznagar	1	-	1	-	3	-	-	-	-	5
Kamareddy	-	-	-	-	1	-	-	-	-	1
Karimnagar	-	-	2	-	5	-	-	-	1	8
KBR National park	-	-	-	-	-	-	-	-	-	0
Khammam	-	1	-	-	-	-	-	-	-	1
Khanapur	-	-	-	-	2	-	-	-	-	2
Kinnersani WLM	-	1	6	-	7	-	-	-	-	14
Mahabubnagar	-	-	-	-	5	-	-	-	-	5
Mahububabad	-	2	2	-	-	1	-	-	-	5
Mancheril	-	-	2	1	-	-	-	-	1	4
Manuguru	-	3	-	1	-	-	-	-	-	4
Medak	-	1	1	-	-	-	-	-	-	2
Medak WLM	-	-	-	1	7	-	-	-	-	8
Nagarjunasagar WLM	1	-	4	1	5	1	-	-	-	12
Nalgonda	2	-	-	-	-	-	-	-	-	2
Nirmal	-	5	4	-	-	-	-	-	-	9
Nizamabad	-	-	1	-	1	-	-	-	1	3
NZP, Hyderabad	-	-	-	-	4	-	-	-	-	4
Paloncha	-	-	2	-	-	-	-	-	1	3
Peddapally	3	1	2	-	-	-	-	-	-	6
Rangareddy	-	-	-	-	-	-	-	-	-	0
Sangareddy	-	-	2	-	-	-	-	-	-	2
Sathupally	-	-	-	-	-	-	-	-	-	0
Siddipet	-	-	2	-	-	-	-	-	-	2
Sircilla	-	-	1	-	-	1	-	-	-	2
SS Hyderabad	-	-	-	-	-	-	5	-	-	5
TSFA, Dullapally	-	-	-	-	-	-	-	11	-	11
Utnoor	-	3	3	1	-	1	-	-	-	8
Venkatapuram	-	-	1	1	-	1	-	-	-	3
Vikarabad	-	-	-	-	1	-	-	-	-	1
Wanaparthy	-	-	-	-	-	-	-	-	-	0
Warangal Rural	-	-	3	-	-	-	-	-	-	3
Warangal Urban	-	-	-	-	-	-	-	-	-	0
Warangal WLM	-	-	-	-	5	-	-	-	-	5
WLM, Hyderabad	-	-	-	-	12	-	-	-	-	12
Yadadri Bhuvangiri	-	-	4	-	-	2	-	-	1	7
Yellandu	-	2	-	-	-	-	-	-	-	2
Grand Total	22	37	92	18	91	23	17	11	9	320

Map 4.1.1b: Map showing other 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 I*). 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 II*) 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.

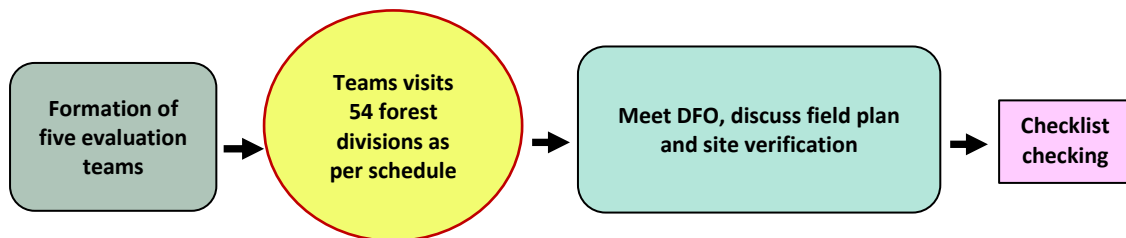


Fig 4.1.2: Flow chart of Stage 2 - Field strategy.

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 III.

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.

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 presence of forest department officials 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).

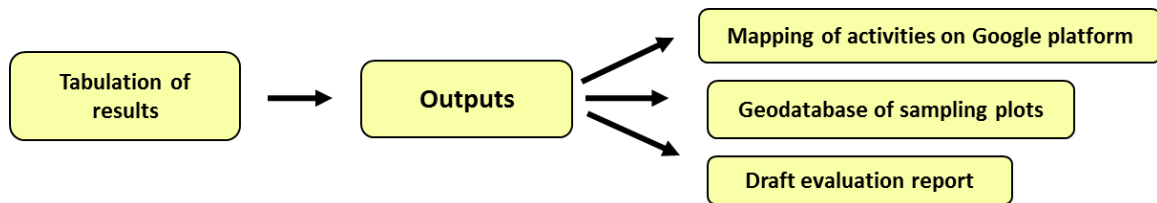


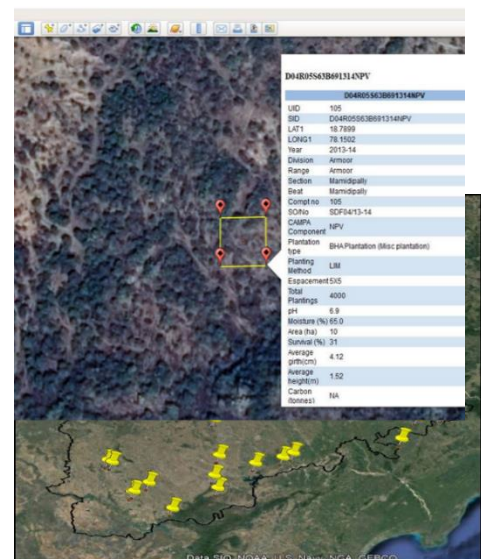
Fig 4.1.5: Flow chart of Stage 5 – Final output.

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 2015-2016.

4.1.5.2 Outputs

- a) Geodatabase created of all sampled plantation plots (*file CAMPA_2015_2016_field_plantation_samples.kmz*)
- b) All activities mapped using Arc GIS and exported to Google earth platform (*file CAMPA other activities samples_2015-2016.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 ha¹³ (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° in north-east, at 135° in the south-east, at 225° in the south-west, and at 315° 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 VI.

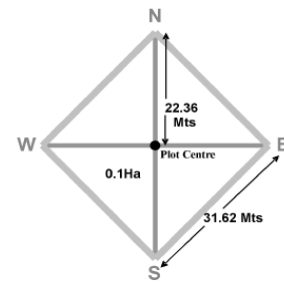


Fig 4.1.3.2: Sample plot layout.

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. ¹⁴

- 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, 2016¹⁵ 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 IV.

¹³National Working Plan Code — For Sustainable Management of Forests & Biodiversity in India (2014), MoEFCC, 91p.

¹⁴FSI (2015) Carbon Stocks in India's Forest, 164p

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

(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 V.

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 CA and NFM other activities, Soil and Water Conservation measures Forest protection and Biodiversity conservation, the scoring was done in a scale of 0 to 200. Scoring to evaluated works was based on the deviations observed in between the records and in the field. For deviations less than 10% = 200 points, 11% to 20% = 150 points, 21% to 30% = 120 points, 31% to 40% = 60 points, 41% to 50% = 30 points and for deviations above 50% = 0 points was given.

b) Other activities under FFM, 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 sheet¹⁶.

Quantitative Aspects (A)				Qualitative Aspects (B)			
S.No.	Main Heading	Score	Total	S.No.	Main Heading	Score	Total
I.	Plantation Activities (Compensatory Afforestation and Natural Forest Management)		500	I.	Impact of awareness Generation campaign		5
II.	Soil and Water Conservation Measures		200	II.	Identification of approved Site for plantation		5
III.	Other Activities (CA/NFM)		200	III.	Improvement in quality of wildlife habitat		5
IV.	Forest Protection		200	IV.	CAMPA benefits		10
V.	Forest Fire Management		10	V.	Project Awareness		5
VI.	Biodiversity Conservation and Development		200	VI.	Transparency, maintenance And payments		5
VII.	Research & Development		10	VII.	Maintenance of assets Created		10
VIII.	Capacity Building		10				
IX.	Information Communication & Technology		10				
X.	M&E		10				
Total (A)			1350	Total (B)			45
GRAND TOTAL (A+B)							1395

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.

Table 4.3.2. Percent of the total score obtained is used to rank the performance¹⁷ 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

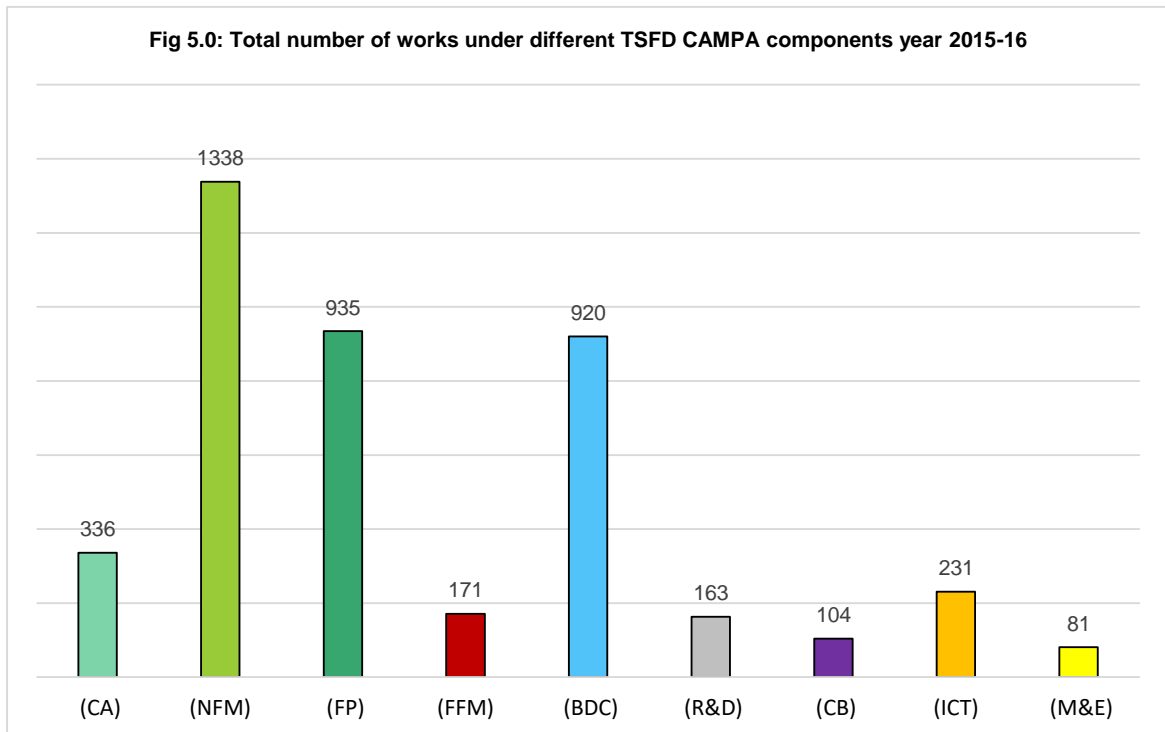
¹⁶ The total score assigned to the components were done as per the percentage expenditure under the various sub-components of CAMPA and their importance.

¹⁷National 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 2015-2016 is shown in Figure 5.0.



A total of 4279 works were undertaken in the state of Telangana during 2015-2016 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 17 divisions under 6 circles. The highest number of CA works was undertaken by Nalgonda division. NFM activities were undertaken in 23 divisions under 7 circles, Kothagudem undertook the highest number of NFM activities. FP works were carried out in 28 divisions of the state, among which Jannaram had undertaken a maximum number of forest protection works. BDC works were undertaken by 19 divisions with Achampet undertaking maximum number of BDC activities.

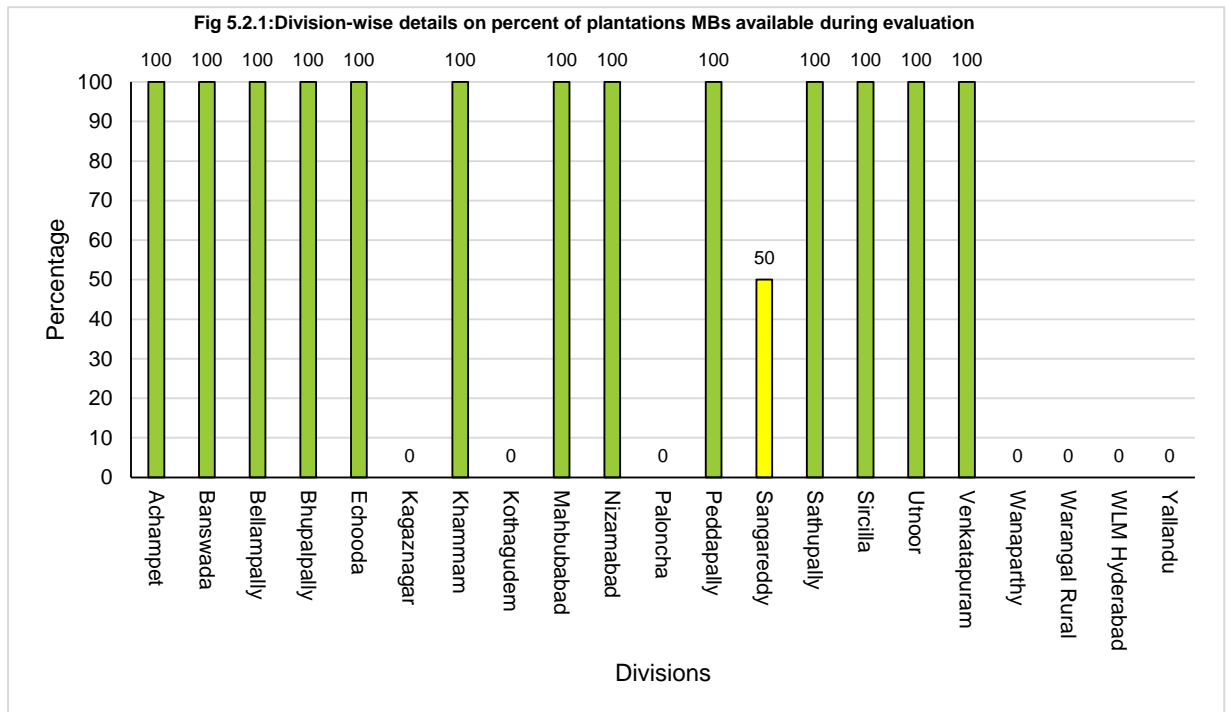
Table 5.0: Division wise total number of works under different components of CAMPA for the year 2015-2016 (division list as per before bifurcation).

Circle	Division	CA	NFM	FP	FFM	BDC	ICT	M&E	R&D	CB	Total Works
Adilabad	Adilabad	27	54	63	5	2	8	2	-	-	161
	Nirmal	8	86	60	17	51	14	1	-	-	237
	Jannaram WL	-	2	135	11	135	23	6	-	-	312
	Mancherial	1	85	22	4	15	6	3	-	-	136
	Bellampally	25	73	9	12	-	4	1	-	-	124
	Kaghaznagar	12	70	29	4	9	8	2	-	-	134
Hyderabad	Hyderabad	1	45	42	11	24	5	4	-	-	132
	Mahabubnagar	18	33	26	8	13	5	7	-	-	110
	Nalgonda	82	33	12	1	-	4	-	-	-	132
Khammam	Khammam	4	103	24	-	-	6	7	-	-	144
	Kothagudem	-	144	50	3	-	12	3	-	-	212
	Paloncha	16	111	23	3	-	9	2	-	-	164
	Bhadrachalam (N)	8	46	25	1	-	6	-	-	-	86
	WLM Paloncha	-	29	27	2	49	5	4	-	-	116
Nizamabad	Nizamabad	-	34	38	10	24	4	7	-	-	117
	Kamareddy	2	56	35	16	33	8	2	-	-	152
	Medak	11	85	32	1	4	14	3	-	-	150
	WLM Medak	-	-	14	1	93	2	1	-	-	111
Warangal	Warangal (N)	59	30	43	5	-	15	6	-	-	158
	Warangal (S)	-	80	36	5	-	8	4	-	-	133
	Warangal WLM	-	-	19	1	140	5	2	-	-	167
	Karimnagar (E)	41	54	46	7	-	14	2	-	-	164
	Karimnagar (W)	3	59	29	2	17	9	2	-	-	121
FDPT	Achampet	-	25	72	30	144	8	3	-	-	282
	Nagarjunasagar	18	1	15	7	29	4	2	-	-	76
TSFA	APFA Dullapally	-	-	-	-	-	-	-	-	104	104
R & D Circle, Hyderabad	SS Hyderabad	-	-	-	-	-	-	-	55	-	55
	FG Warangal	-	-	-	-	-	-	-	108	-	108
WLM Hyderabad	CNP	-	-	4	2	84	3	2	-	-	95
	WLM Hyderabad	-	-	4	2	51	2	2	-	-	61
Director ZP Hyderabad	NZP Hyderabad	-	-	1	-	3	-	1	-	-	5
ICT Hyderabad	ICT Hyderabad	-	-	-	-	-	20	-	-	-	20
Total		336	1338	935	171	920	231	81	163	104	4279

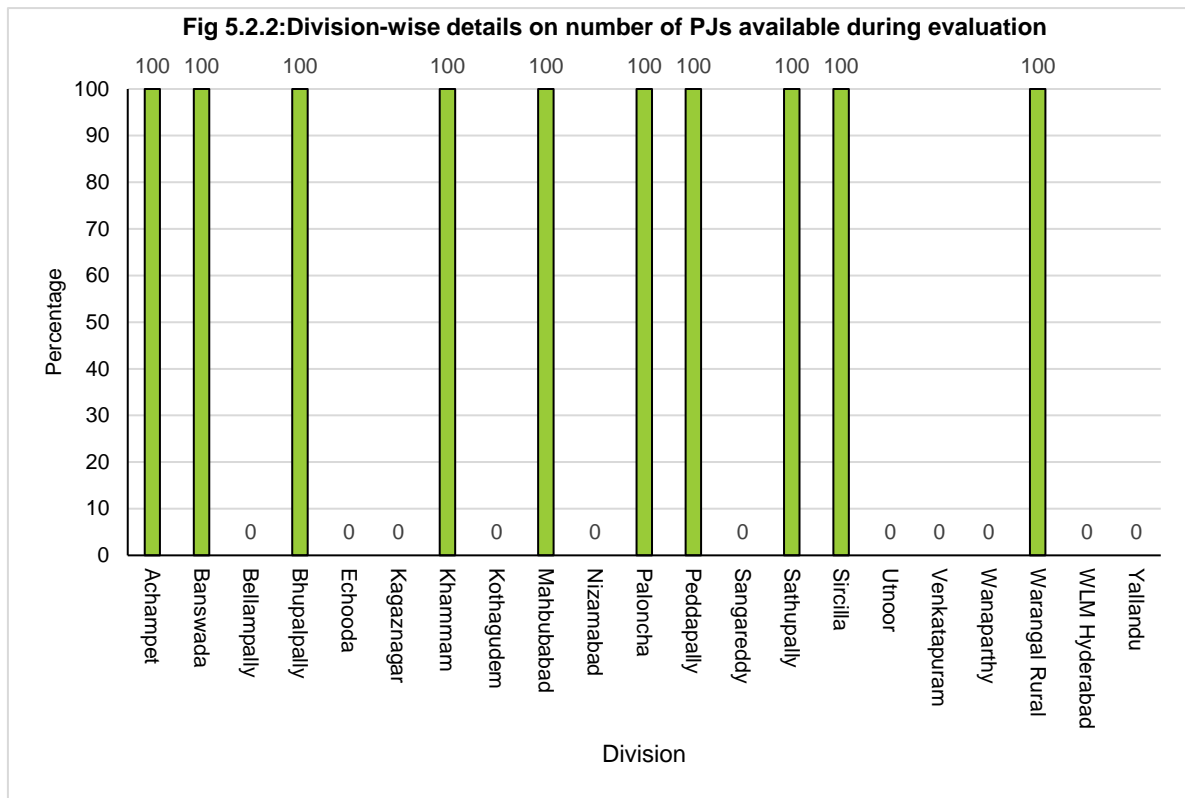
5.1 Data Analysis of CAMPA Plantation activities: Data collected for plantation activities and other activities during field evaluation of the sample CAMPA activities for the year 2015-2016 were digitized, collated and checked as per the audited records available at the O/o PCCF, TSFD, Aranya Bhavan. 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 25 plantations, only for 17 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 25 sample plantations, only 10 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: Plantation Journals (PJ) could be examined for only 40% of the plantations 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 were unable to produce them during the evaluation. Lack of PJ for the remaining 60% 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.

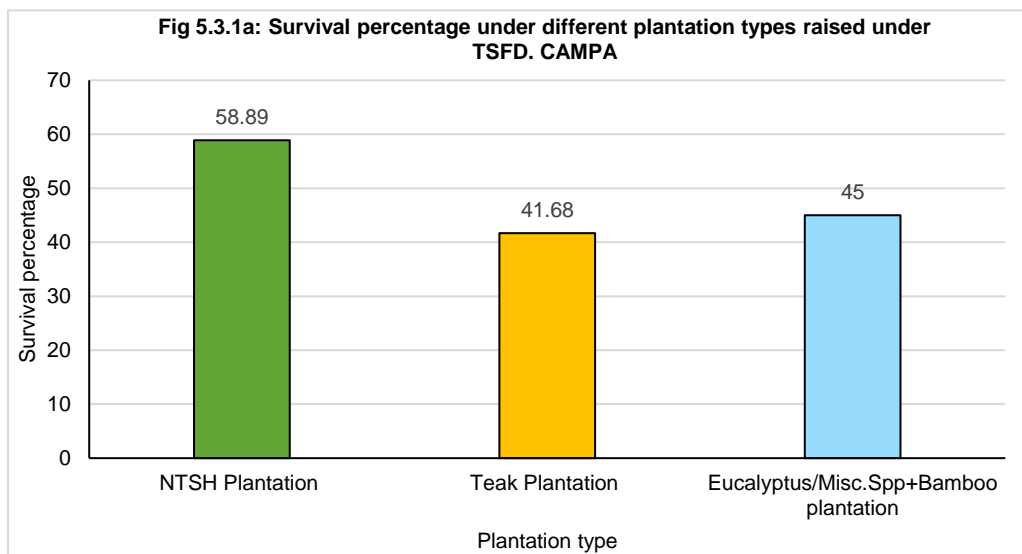
Measurement Book (MB) could be examined for sixty-eight percent of the plantation samples evaluated. It indicates that more attention was given to MBs. MBs were always kept with care in the range where plantation has been carried out. Further in all the available MBs for other activities, grid-wise details 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.

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.

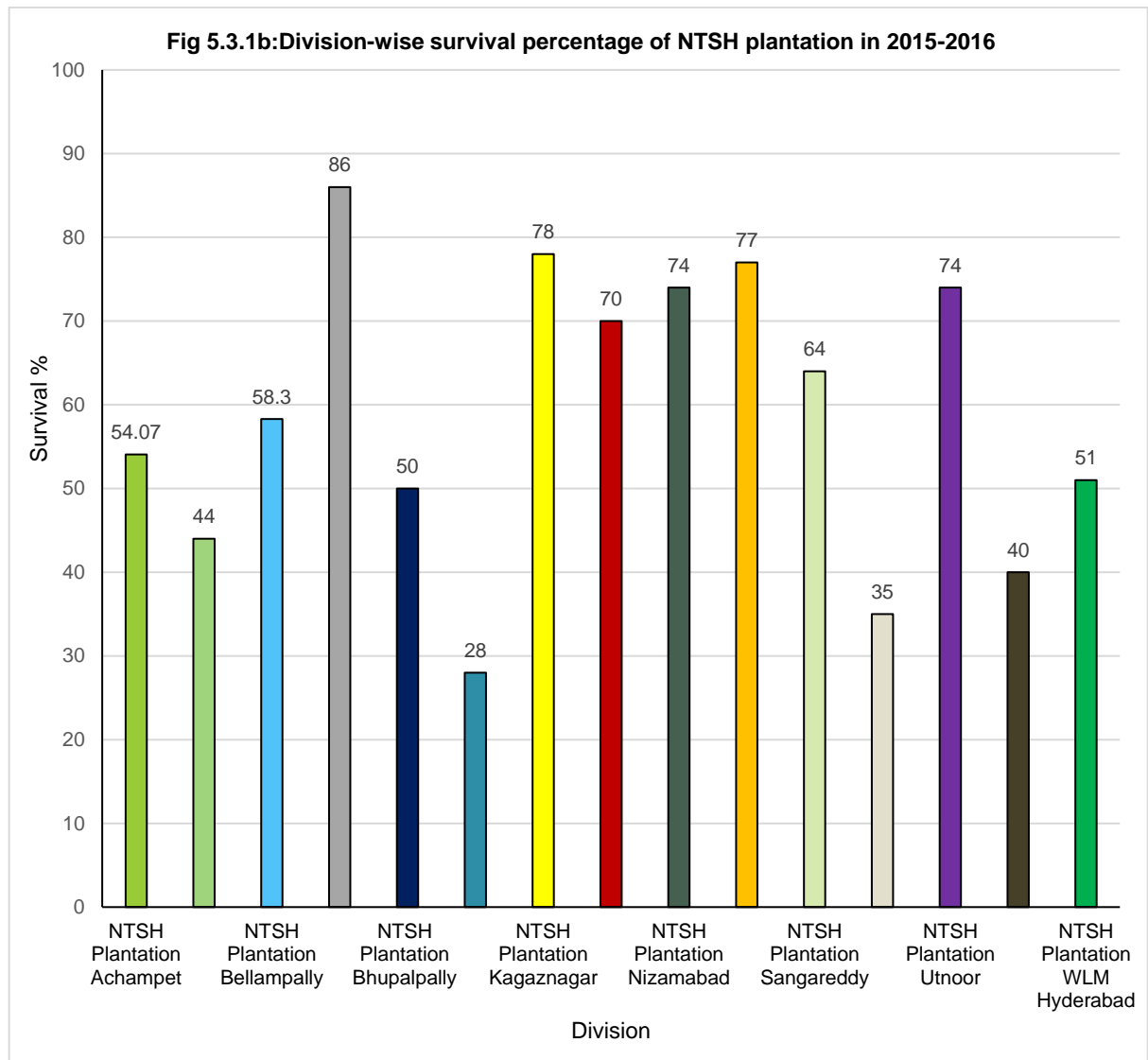
5.3 Survival percentage: Survival percentage of plantations is one of the vital parameter evaluated. It reflects the overall performance of plantations. Analysis of the survival percentage of the plantations was analyzed from different aspects namely methods of plantations, CAMPA components, species,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

5.3.1 Survival percentage of plantations raised under different plantation type: Survival percentage of under different plantation types raised by TSFD CAMPA during 2015-2016 is shown in figure 5.3.1a. Three different plantation types were recorded, namely NTSH plantation, Teak plantations and Eucalyptus/Misc. Spp mix with bamboo plantation. NTSH plantation had the highest survival percentage followed by Eucalyptus/Misc. Spp mix with bamboo plantation. Teak plantation showed lowest survival percentage during evaluation. Overall NTSH plots had also reported moderate survival percentage when compared to the other plantation types.



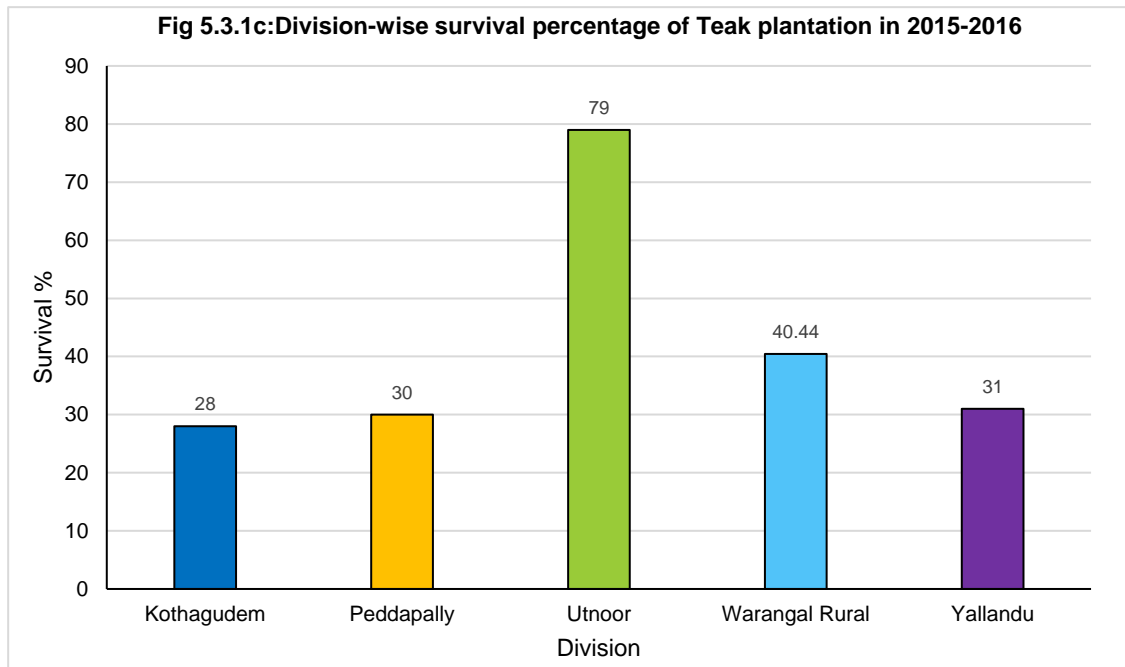
Division wise plantation survival percentages: Division wise survival percentage of NTSH and Teak plantations, miscellaneous and Eucalyptus/Misc. Spp mix with bamboo plantation is shown in fig 5.3.1b to Fig 5.3.1f.

NTSH plantations were raised by 14 divisions under CAMPA in 2015-2016. Average survival percentage of NTSH raised under TSFD CAMPA across the divisions ranged from 28% to 86%.

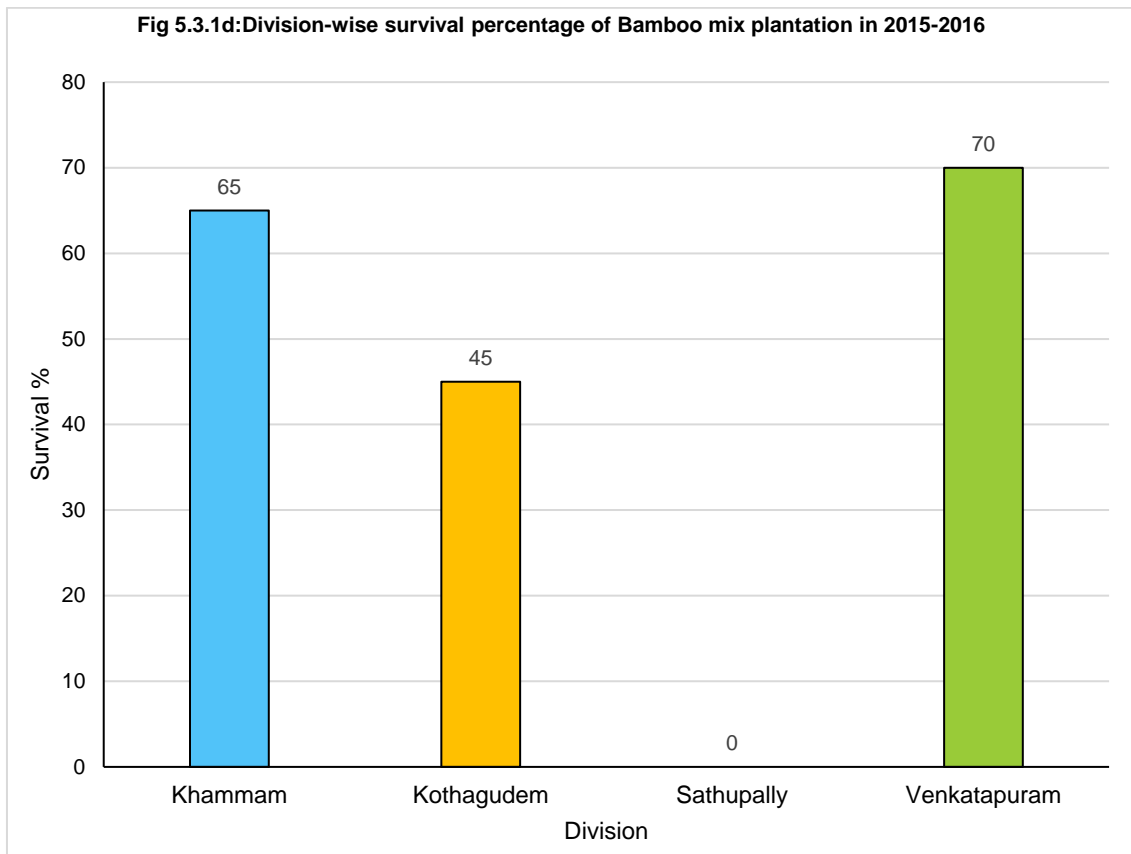


Comparison of survival of plantations across the divisions (see Fig 5.3.1b) revealed that Bhupalpally had the highest survival percentage of NTSH followed by Kagaznagar, Paloncha, Utnoor, Nizamabad, Mahbubabad, Achampet, WLM Hyderabad, Bellampally, Sangareddy, Banswada, Wanaparthy and Echoda. Echoda reported the lowest survival percentage of NTSH plantation.

Teak plantations were evaluated in 5 divisions which were raised under CAMPA during 2015-2016. Average survival percentage of NTSH raised under TSFD CAMPA across the divisions ranged from 28% to 79%. Comparison of Teak plantations survival across the divisions (see Fig 5.3.1c) revealed that Utnoor had the highest survival percentage of teak plantation followed by Warangal rural, Yellandu, Peddapally, and Kothagudem. Kothagudem and Peddapally divisions reported the lowest survival of Teak plantations raised under TSFA CAMPA during 2015-2016.



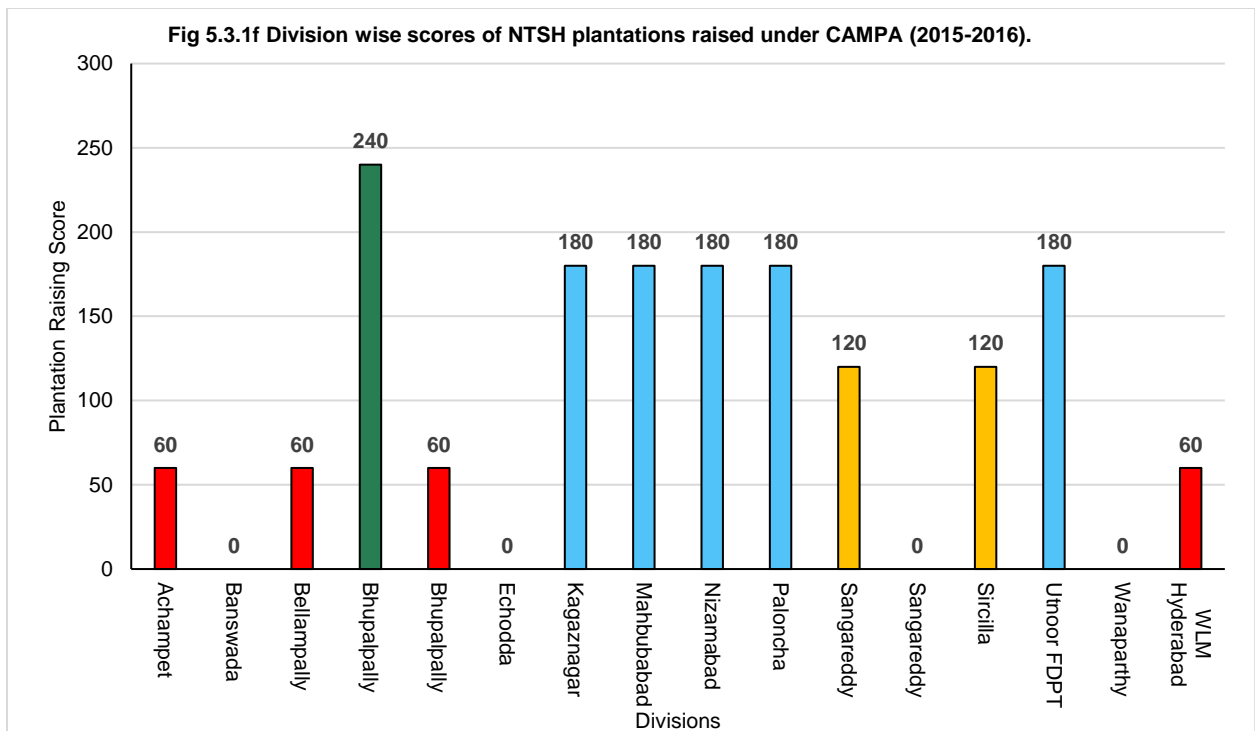
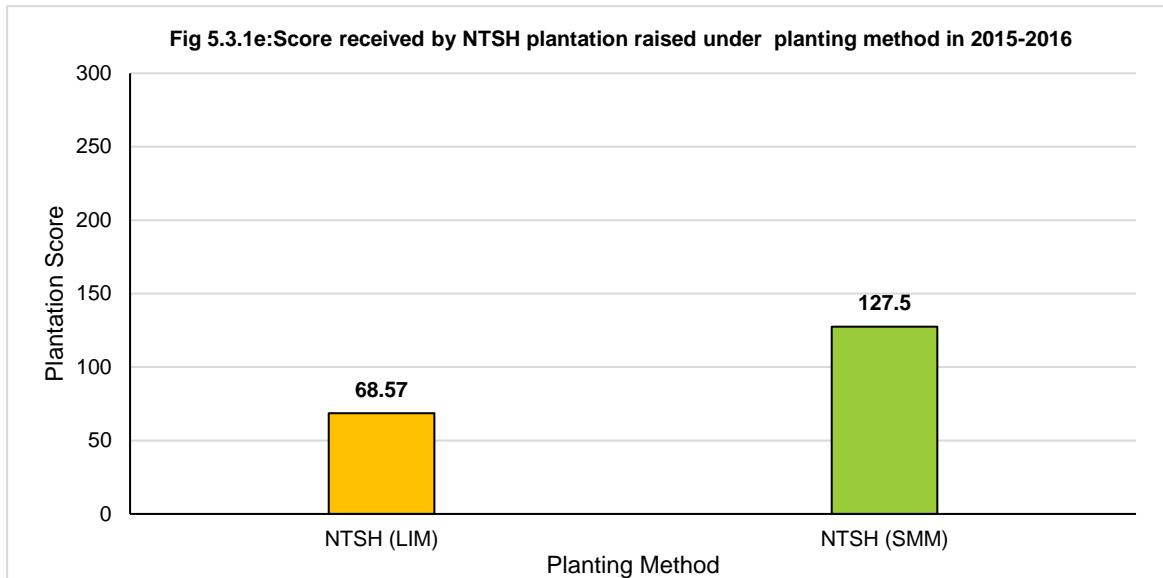
Eucalyptus/Misc. Spp mix with bamboo plantation were mainly raised by 4 divisions under TSFD CAMPA during 2015-2016. Most of these division comes under the Khammam circle. Average survival percentage of the Bamboo mix plantations under TSFD CAMPA across the divisions ranged from total failure (0%) to 70%. Comparison of bamboo mixed plantations survival across the divisions (see Fig 5.3.1d) revealed that Venkatapur had the highest survival percentage of Eucalyptus/Misc. Spp mix with bamboo plantation followed by Khammam, Kothagudem and Sathupally divisions. Eucalyptus/Misc. Spp mix with bamboo plantation raised by TSFD CAMPA during 2015-2016 under Sathupally division failed due to heavy biotic pressure.



Findings: The plantations under TSFD CAMPA during 2015-2016 were raised mainly under three different plantation types namely; NTSH plantation, Teak plantations and Eucalyptus/Miscellaneous spp mixed with bamboo. 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, NTSH plantation raised with a spacing of 3m x 3m scored highest points. The average score of NTSH plantation obtained was 101.25 followed by Eucalyptus/Misc spp mix with Bamboo plantation 75. Teak plantations scored 36 which was the lowest score.

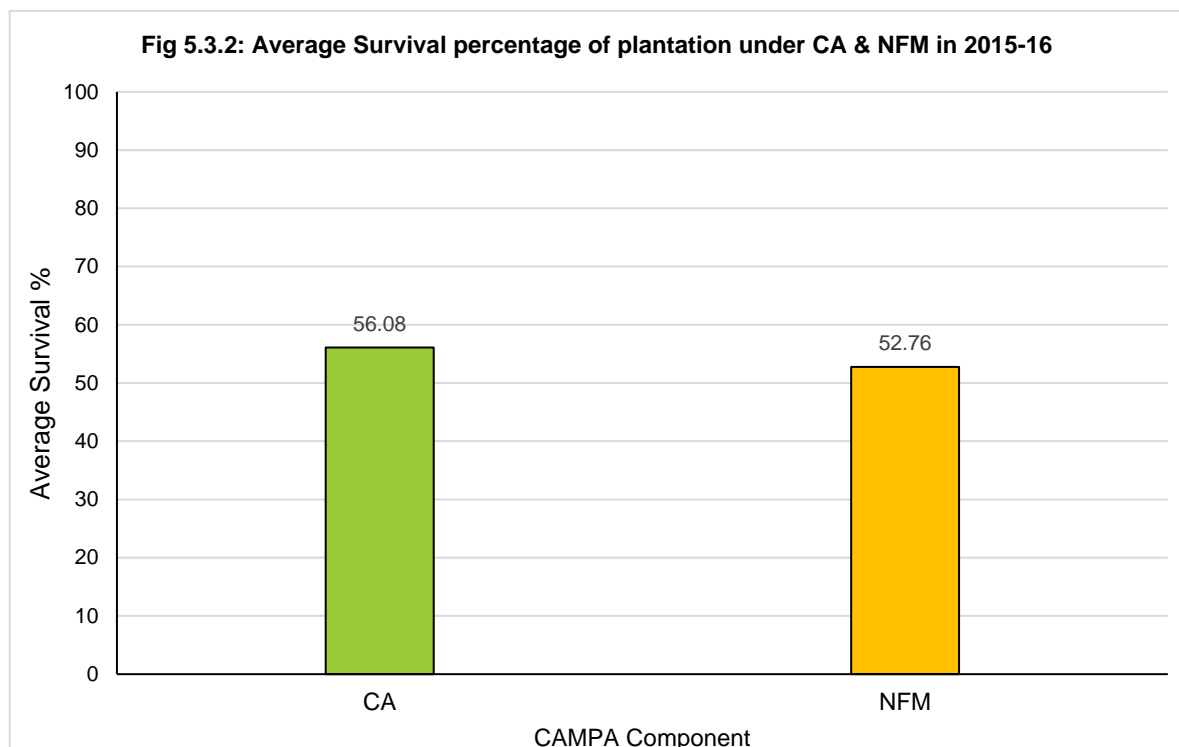
In 2015-16, no pure stand of Eucalyptus plantations were raised by TSFD. The NTSH plantation is raised in around 1682 ha area and the scored achieved by the plantation is highly unsatisfactory. This poor performance of NTSH plantation were attributed to biotic interferences such as grazing, lopping, fire, in almost all the plantation, as well as haphazard plantation and lack of quality planting material, time and method. Under division-wise NTSH plantation performance, the plantations performance was best recorded in Bhupalpally and lowest in Echoda, Banswada and Wanaparthy refer Fig 5.3.1f. The plantations have significant biotic disturbances especially grazing, but plantations exhibited comparatively better growth in comparison to the Teak and other bamboo mix plantations raised in other divisions in 2015-16. The finding also reveals that the NTSH

plantations raised using Semi-mechanical method (SMM) scored 127.5 which is better in comparison to NTSH plantation raised using Labour Intensive Method (LIM) which scored 68.57, refer Fig 5.3.1e.



The Teak plantation raised in 2015-16 shows highly unsatisfactory performance as of low survival rate as well as poor growth. The Information received during field visits revealed along with biotic pressure, the lack of rains after plantation of teak sapling significantly reduce teak survival and growth. Suitable soil, soil with good depth and ability to retain water is necessary for the survival of Teak plants. In most of the Bamboo and mixed plantation evaluated the survival of bamboo was reported very low in comparison of Eucalyptus and other miscellaneous species raised.

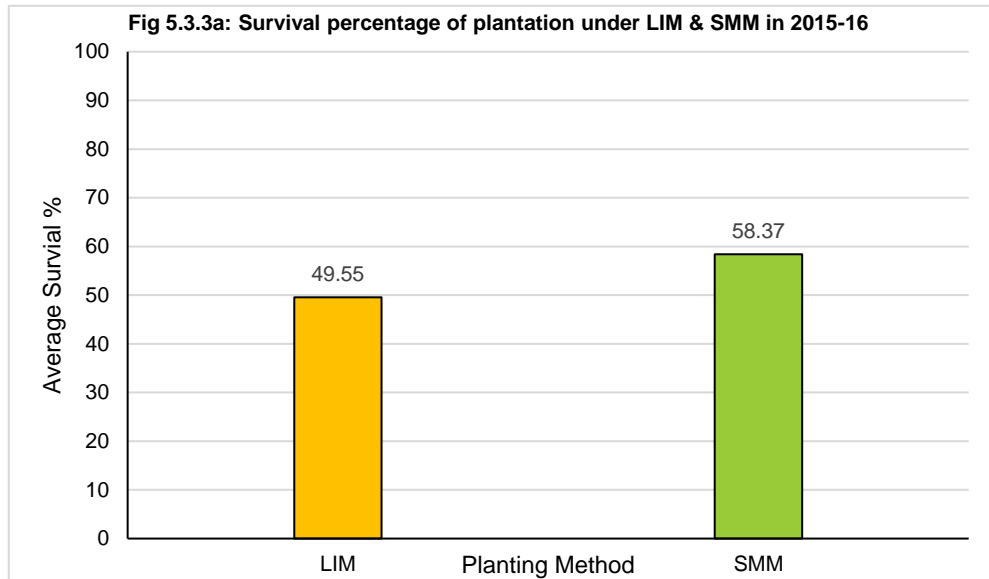
5.3.2 Survival percentage of plantations under different CAMPA components: Plantations activities was carried out mainly under two CAMPA components namely CA and NFM in the state of Telangana during 2015-2016. Comparison of survival percentages of plantations raised under the different CAMPA components is shown in Fig 5.3.2. It shows that plantations raised under NFM exhibited the highest survival percentage (52.76%) followed by plantations raised under CA (56.08%).



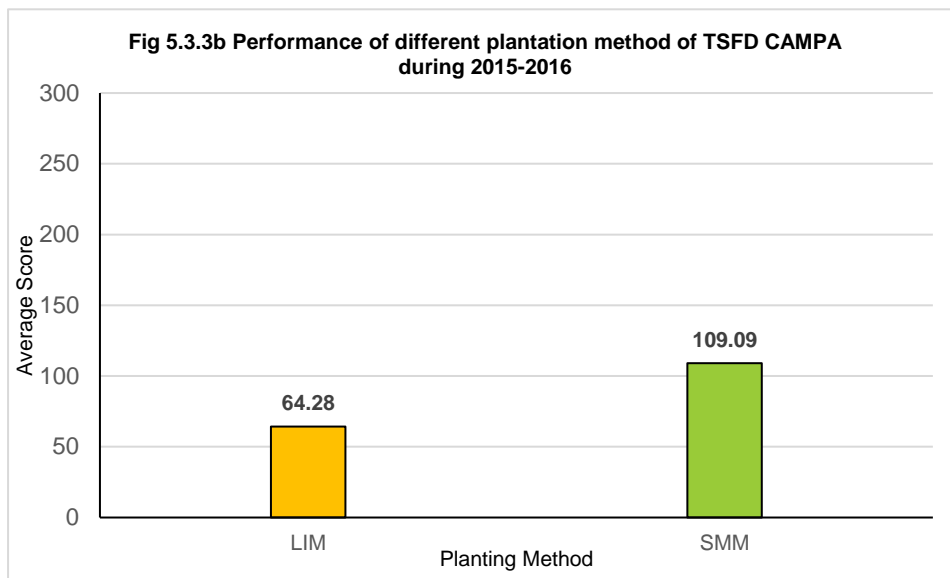
Findings: Analysis of field evaluation revealed that plantations raised under CA performed slightly better than those raised under NFM. Survival of plantation raised under raised under CA and NFM doesn't show high variability. **Scores obtained by plantation raised under different CAMPA components namely CA, and NFM are 84 and 81.17 respectively.**

5.3.3 Survival percentage of plantations under different planting methods: Two planting methods namely Labour Intensive Management (LIM) and Semi Mechanical Management (SMM) was adopted for raising plantations under TSFD, CAMPA during 2015-2016. Graphical

representation of the results of plantations under the different planting methods is shown in Fig 5.3.3a. Survival of plantations was significantly higher (58.37%) under SMM method. Average survival percentage of plantations raised under LIM was found to be 49.55 percent.

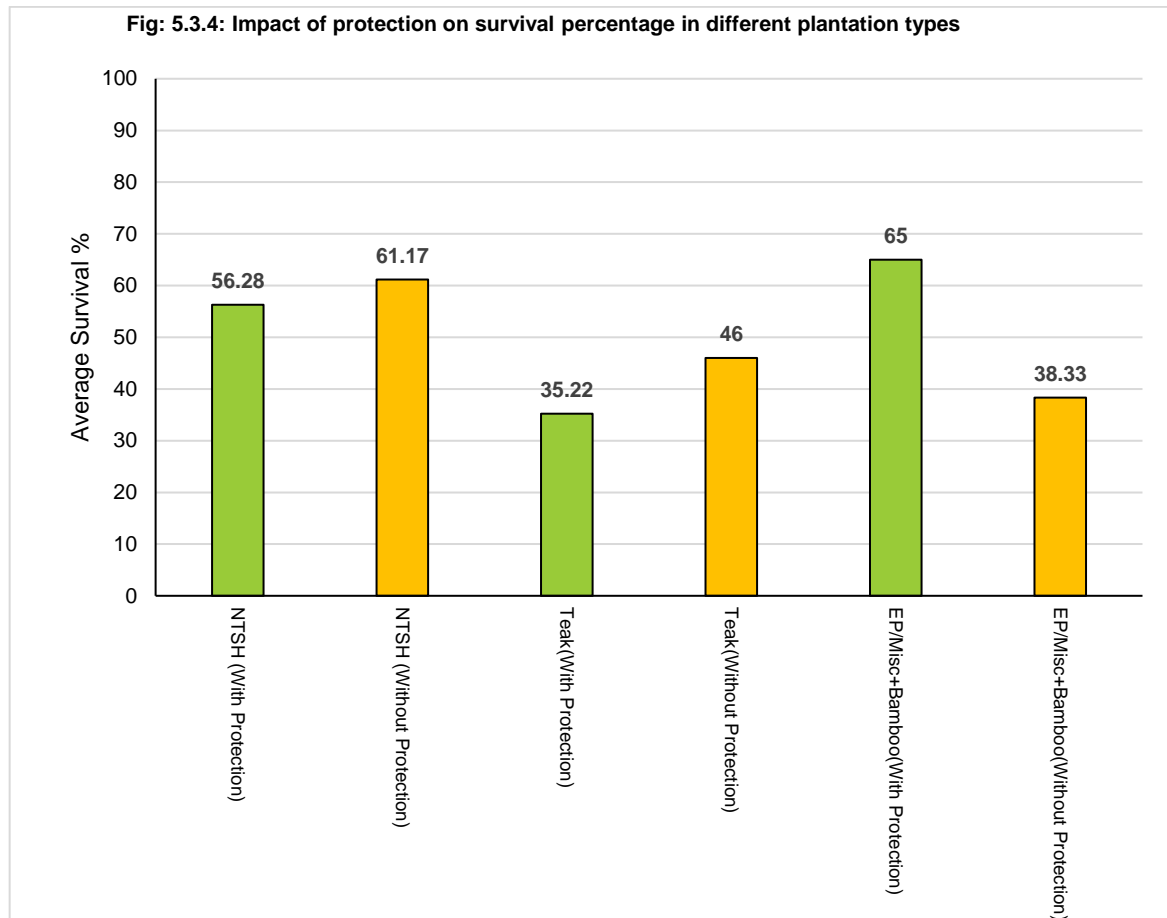


Findings: Most of the NTSH plantation were raised using SMM method showed better performance as compared to the one raised under LIM or pit & planting method. The Teak plantation raised using LIM techniques resulted in poor performance. **The score achieved for the performance under LIM and SMM are 64.28 and 109.09 respectively out of 300.**



5.3.4 Survival percentage of plantations with protection and without protection: Data was analyzed and compared for the survival of different plantation types with protection and without protection. It is shown in Fig 5.2.4. It reveals that survival of NTSH plantation was more (61.17%)

under without protection and lower (56.28%) in areas with protection. Survival of plants raised under NTSH and Teak plantations were higher in areas without protection. Bamboo mixed plantations shows opposite trend with high survival under protection and low without protection, the survival percent recorded was 65 and 38.33 percent respectively.

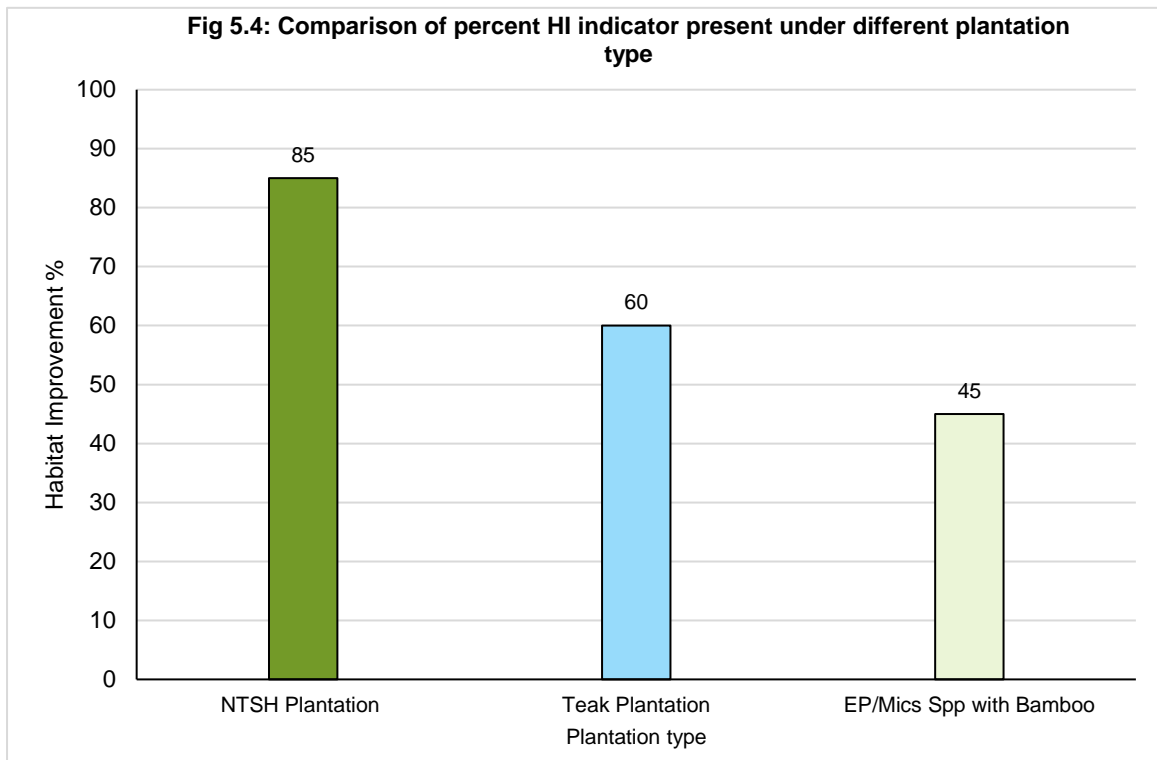


Findings: Under protection, plantation survival was less in NTSH and Teak but the trend was opposite in Bamboo mix plantation. The trend reveals that the protection given to plantation sites are ineffective due to the reason that the sites were earlier encroached and plantations were carried out after 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 eighty-five percent of NTSH plantations raised under TSFD, CAMPA, followed by teak and bamboo mix plantations. Presence of wildlife was recorded

in 60% of the Teak plantations. Presence of wildlife was observed only in 45% of the sites under Eucalyptus plantations.



Findings: Presence of wildlife was recorded in 85 percent of NTSH plantations raised under TSFD, CAMPA. Presence of wildlife was recorded in 60% of the teak plantations and only in 45% of the Bamboo mixed plantations during field evaluation signs of wildlife or wildlife was observed. It reflects that of NTSH plantations attract more wildlife compare to the other pure plantation.

5.5 Growth of trees: Comparison of average height and average girth of different tree species raised under TSFD CAMPA during 2015-2016 is shown in Figure 5.5. All plantations evaluated are under one year old plantation as they are raised in 2015-2016. The Bamboo mixed with Eucalyptus plantations exhibited faster growth, in terms of height and girth followed by NTSH plantation planted under TSFD CAMPA. Teak is not a good performer under TSFD CAMPA plantation in all the sites. Division wise details of growth of NTSH and Teak and Eucalyptus/Misc spp mix with bamboo plantations is shown in figure 5.5.1, 5.5.2 and 5.5.3, respectively.

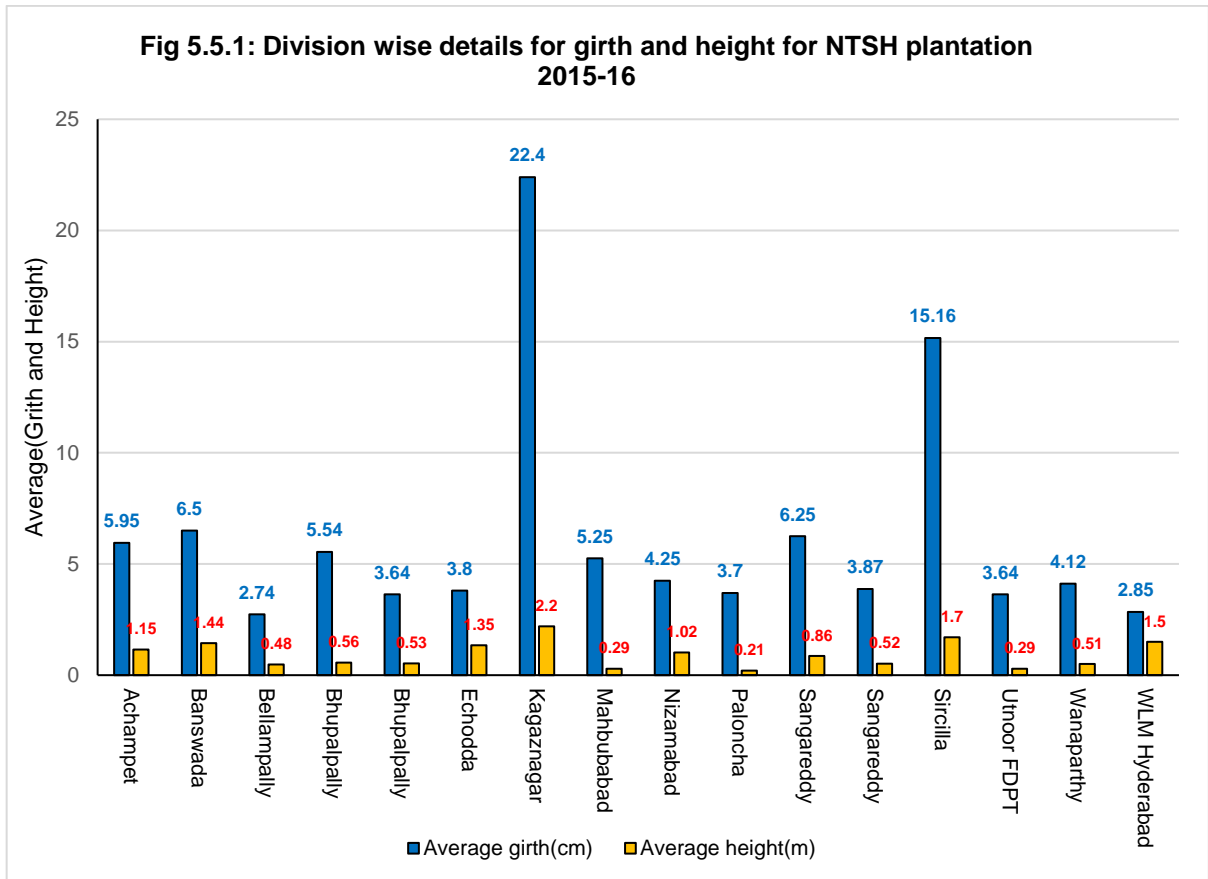
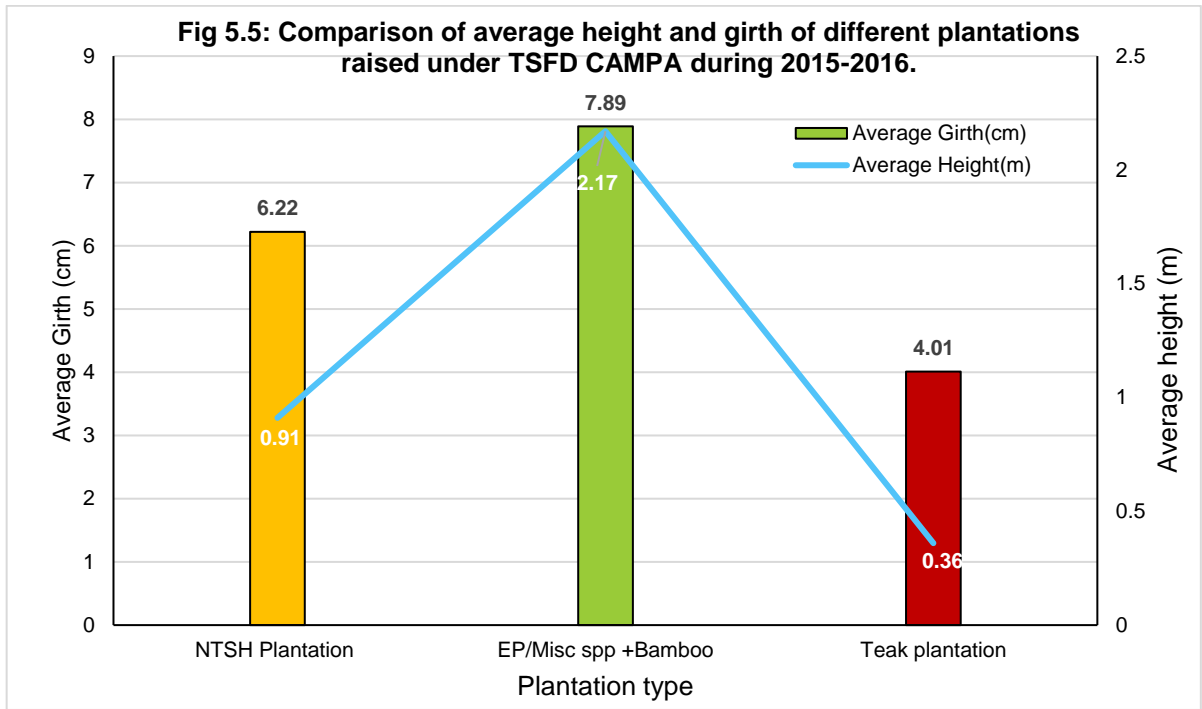


Fig 5.5.2: Division wise details for girth and height for Teak plantation 2015-16

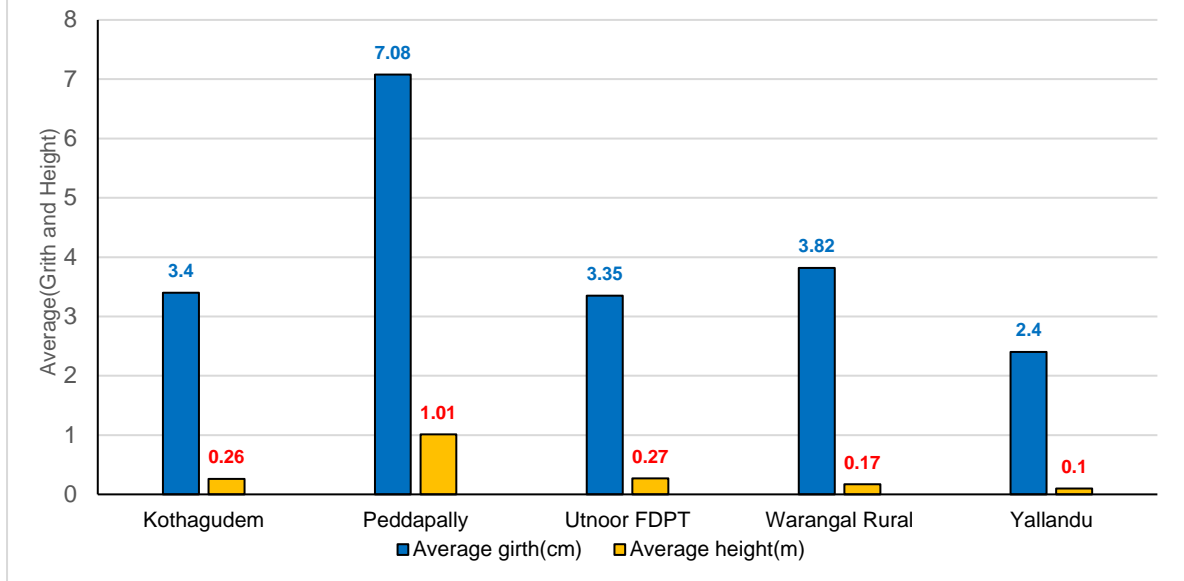
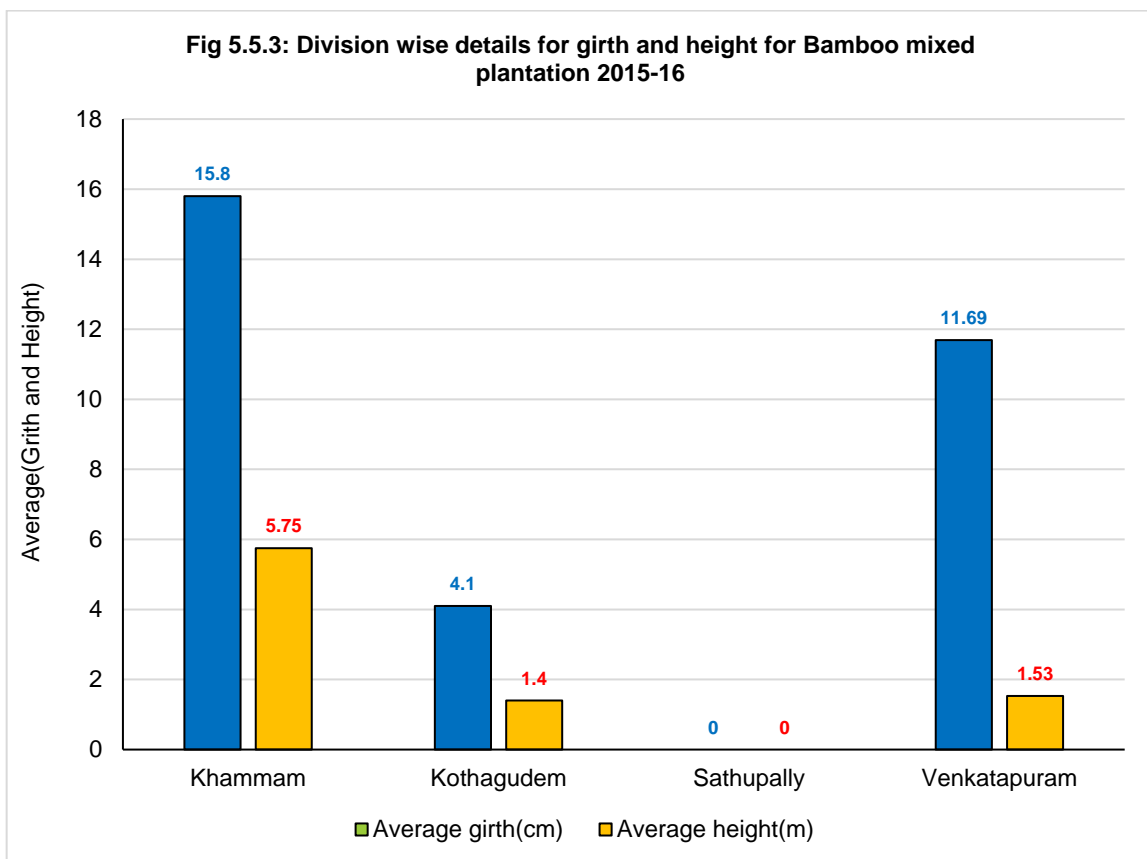


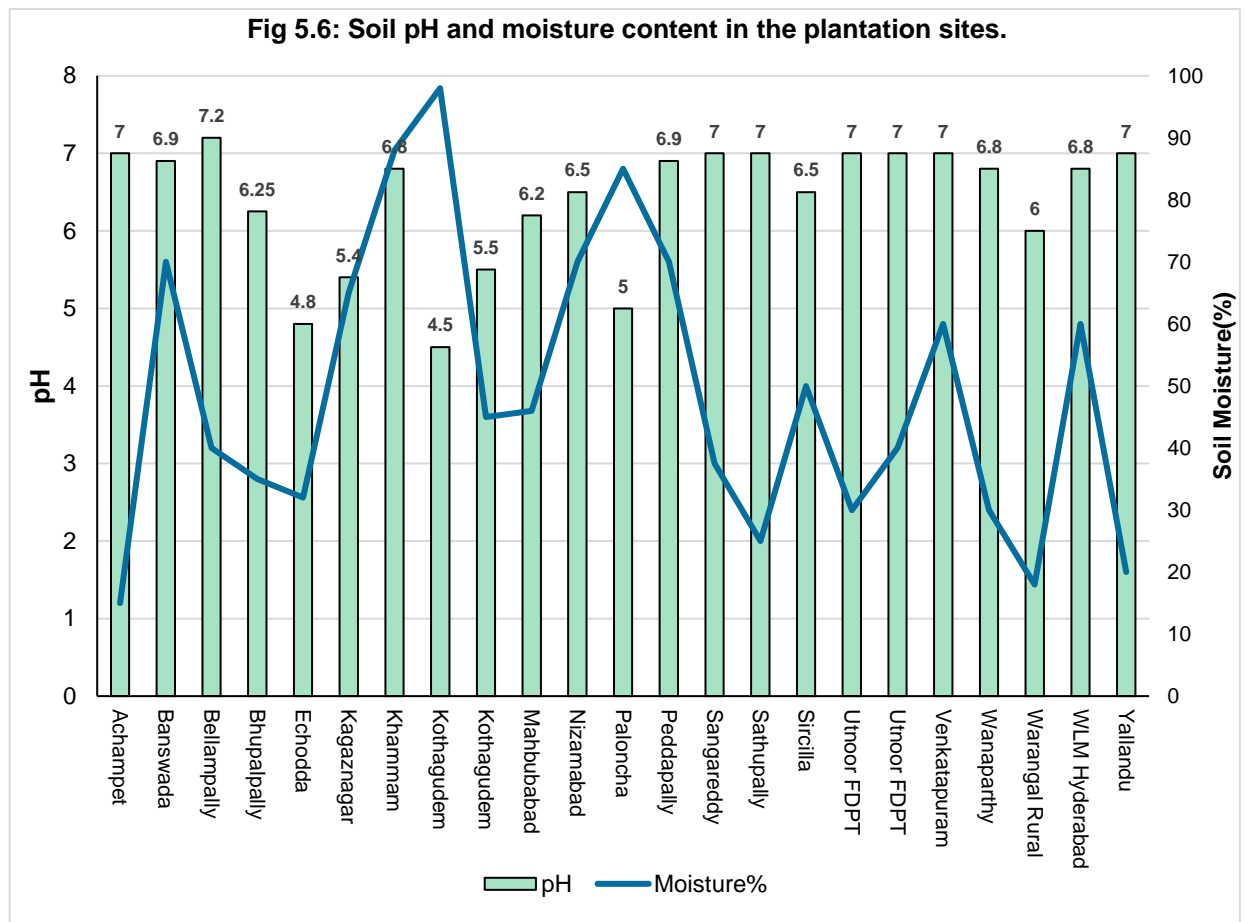
Fig 5.5.3: Division wise details for girth and height for Bamboo mixed plantation 2015-16



Findings: Eucalyptus is a fast growing species as it's reflects in the plantation raised in TSFD CAMPA in 2015-12016. The other factor favor the good growth of eucalyptus spp comparatively less grazing pressure to NTSH. As the grazing pressure is observed in most of the plantation sites evaluated, suppressed the development of NTSH plantation raised under CAMPA.

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.

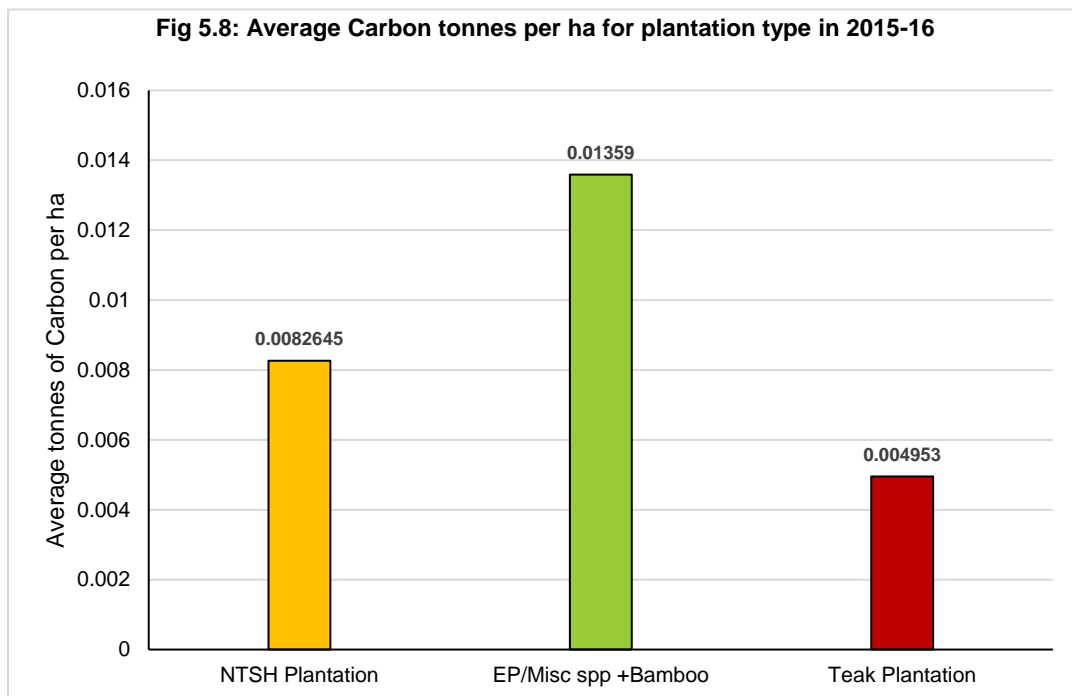
5.6 Soil salinity and moisture status: Soil pH and soil moisture content recorded during the evaluation is shown in Fig 5.6. Soil pH ranged from very acidic 4.5 at Kothagudem to saline to 7.2 at Bellampally. Percent soil moisture content varied widely across the divisions. It varied from 15% to 98%.



Findings: Soil pH and soil moisture content are vital factors for plantations. Soil pH ranged from very acidic 4.5 to saline 7.2 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 15% to 98%. 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: The canopy density of plantation raised under 2015-16 by TSFD CAMPA is very low as the plantation is young and small without definite canopy coverage.

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.¹⁸ Allometric equations are applied only on those species that are above 10 cm in diameter and below both for wood and foliage. As the plantation is raised in 2015-16, the average plantation type per hectare forest



¹⁸ FSI (2011) Carbon Stocks of India's Forest.

carbon varied from 0.004 tonnes per hectare to 0.01 tonnes per hectare. The average per hectare carbon under eucalyptus mixed with bamboo plantation is 0.013 tonnes per hectare followed by NTSH plantations 0.0082 tonnes per ha. For teak the average carbon is lowest 0.0049 tonnes per hectare

South Deccan

S.No.	Species Name	Volume Equation
1	<i>Acacia auriculiformis</i>	$\sqrt{V} = -0,00142 + 2,61911 D - 0,54703 D^2$
2	<i>Albizia amara</i>	$\sqrt{V} = -0,07109 + 2,99732 D - 0,26953 D^2$
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.

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 2015-2016 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 2015-2016. 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 2015-2016 is **200**.

Table 5.9.1: 3rd party CAMPA evaluation score of SWC samples for 2015-2016.

S.No.	Division	Range	Activity	Latitude	Longitude	Component	Dimension/Area in MB	Score
(A) Check dam								
1	Asifabad	Asifabad	Revised construction of check dam no. 1 at Jannugudda	19.4101	79.26924	CA	Earthwork foundation body wall (6X2X1.10); C.C Bed 1 : 4 : 8 ; C.C Bed 1 : 3 : 6, C.C Bed (1:2:4), Plastering and Misc expenditure. . The total	200
2	Asifabad	Asifabad	Revised construction of check dam no. 2 at jannugudda	19.4042	79.267886	CA	Earthwork foundation body wall (6X2X1.10) ; C.C Bed 1 : 4 : 8 ; C.C Bed 1 : 3 : 6, C.C Bed (1:2:4), Plastering and Misc expenditure.	200
3	Jannaram	Jannaram	Construction of checkdam at Earlagutta shivaru of Jannaram range	19.1147	79.018347	CA	Earthwork foundation body wall; C.C Bed 1 : 4 : 3 ; C.C Bed 1 : 3 : 6, C.C Bed (1:2:4), Plastering and Misc expenditure.	200
Total SWC Score								200

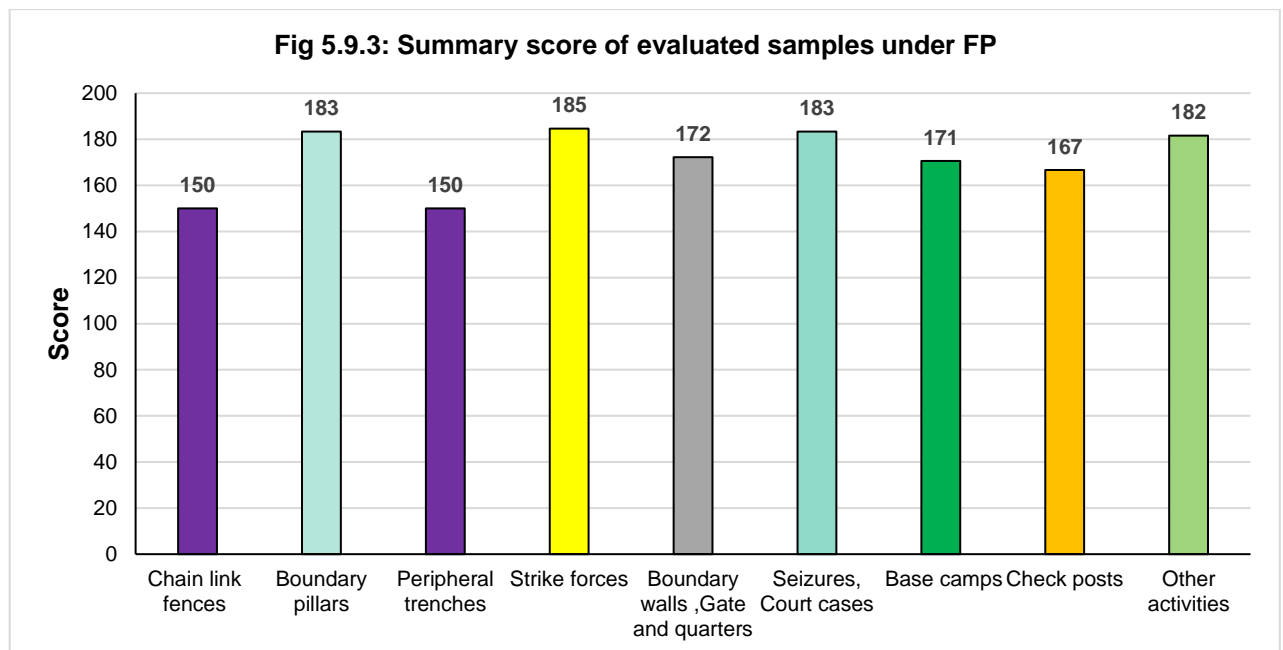
Findings: Soil and water conservation measures undertaken by TSFD CAMPA is able to retain water for a two to a maximum of about six months. As these structure are recently built in 2015-2016, problem like siltation and presence of other debris are not observed and check dams are structurally sound.

5.9.2 Other activities under CA and NFM: A total of 586 different activities were undertaken CA and NFM by TSFD CAMPA during 2015-2016. Fifty-nine samples were evaluated under CA and NFM other activities. Sample evaluation details is provided in Annexure V. **The total score obtained by CA and NFM other activities is 185.53 out of 200.**

5.9.3 Forest Protection: A total of 935 different forest protection activities (FP) were undertaken by TSFD CAMPA during 2015-2016. Ninety-three 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 171 out of 200.**

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	3
C	Peripheral trenches	3
D	Strike forces	13
E	Boundary walls ,Gate and quarters	9
F	Seizures, Court cases	3
G	Base camps	17
H	Check posts	6
I	Other activities	38
Total		93



Findings: Of nine FP sub-components evaluated, variation of dimension was observed in activity under one sub-component i.e. peripheral trenches, boundary pillar, and basecamp. In Kinnersani WLM, during field evaluation, the variation was found to the extent of 11 to 20%. 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 171 different forest fire management (FFM) works were undertaken by TSFD CAMPA during 2015-2016. 10% sample, i.e. 17 samples 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 9.29 out of 10.**

Table 5.9.4: Evaluation summary of FFM samples.

S.No.	Division	Range	Activity	% variation (+/-)	Score
1	Adilabad	Adilabad	Remuneration charges to Forest Fire Watchers engaged in Boath Range from 01/2015 to 03/2016	Less than 10 percent	10
2	Echoda	Echoda	Fire tracing operation in plantation area in Gudihatnoor Beat of Gudihatnoor Section	Less than 10 percent	10
3	Utnoor	Utnoor	Remuneration charges to Forest Fire Watchers engaged in Utnoor Range from 01/2015 to 03/2016	Less than 10 percent	10
4	Achampet	Lingal	Wages to Fire Watchers in Lingal Range during the year 2015-16	Less than 10 percent	10
5	Jannaram	Tadlapet	Wages to Fire Protection Watchers of Asifabad KTR Range	Less than 10 percent	10
6	Venkatapuram	Venkatapuram	Engaging of fire watchers in VKT Range during the year 2015-16	11 to 20 percent	8
7	Banswada	Gandhari	Estimate for Engaging of Fire Watcher in Forest Block Gandhari -I Section Chedmal during 2015-16	Less than 10 percent	10
8	Achampet	Achampet	Wages to firewatchers in Achampet during 2015-16	11 to 20 percent	8
9	Achampet	Kollapur	Wages to Fire Watchers of Kollapur Range	Less than 10 percent	10
10	Amrabad	Amrabad	Wages to Fire Protection Watcher	Less than 10 percent	10
11	Achampet	Lingal	Formation of new fire line (10 mts) in Dharram Beat of Lingal Section	Less than 10 percent	10
12	Amrabad	Mannanur	Formation of New Fire lines (5km) in Burjugundal Beat	Less than 10 percent	10
13	Nagarjunasagar WLM	Devarkonda	Wages to fire watchers in Rekularam Beat of Kambalapally section of DVK Range during 2015-16	11 to 20 percent	8
14	Echoda	Boath	Remuneration charges to Forest Fire Watchers engaged in Boath Range from 01/2015 to 03/2016	Less than 10 percent	10

15	Medak WLM	Poccharam	Engaging Fire Watchers in Poccharam WLS	11 to 20 percent	8
16	Achampet	Achampet	Wages to Fire Watchers	11 to 20 percent	8
17	Mancherial	Mancherial	Wages to Fire Control watchers	11 to 20 percent	8
Total FFM Score					9.29

Findings: Highest FFM works were undertaken in Achampet followed by Nirmal. 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 920 different biodiversity conservation and development activities were undertaken by TSFD CAMPA during 2015-2016. Ninety-two 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 173 out of 200.**

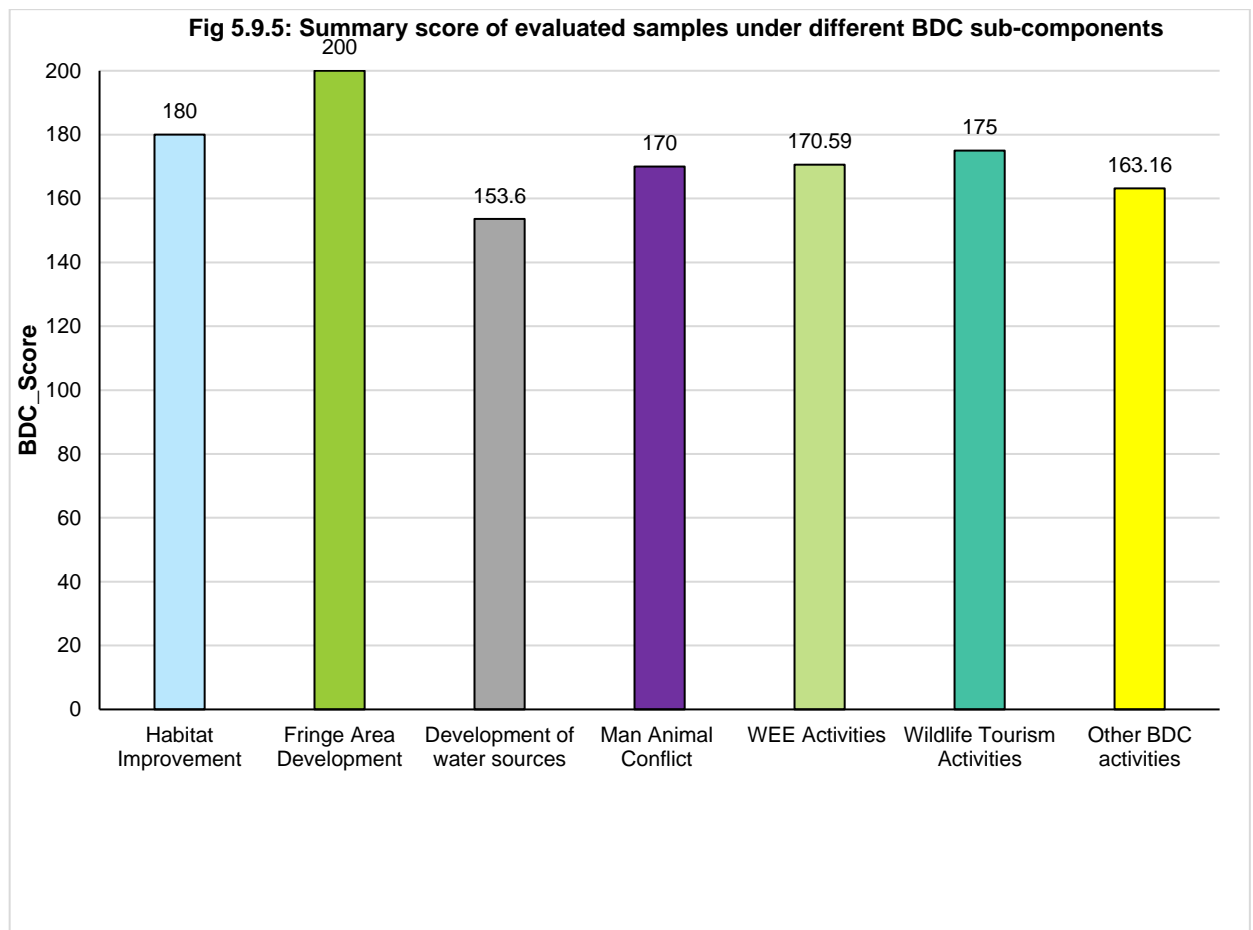


Table 5.9.5: Number of samples evaluated under different sub-components of BDC.

No.	BDC sub components	No. of Samples
A	Habitat Improvement	5
B	Fringe Area Development	9
C	Development of water sources	14
D	Man Animal Conflict	5
E	Activities (anti - poaching, WEE, Ex situ conservation, Research)	17
F	Wildlife Tourism Activities	22
G	Other BDC activities	20
Total		92

Of 9 BDC sub-component, fringe area development scored highest score, followed by wildlife tourism and habitat improvement activities, Wildlife extension education. Development of water resources scores lowest point due to variation and water availability in saucer pit and percolation tanks in wildlife areas.

Findings: There were 920 works under BDC component undertaken in TSFD CAMPA. Highest activities were undertaken in Achampet followed by Warangal WLM and Jannaram WLM Fringe area development scores highest among all the different BDC sub-component.

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 2015-2016 is 163. 10% of the total works, 17 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 9.65 out of 10.**

Table 5.9.6: Summary of R&D sample evaluation.

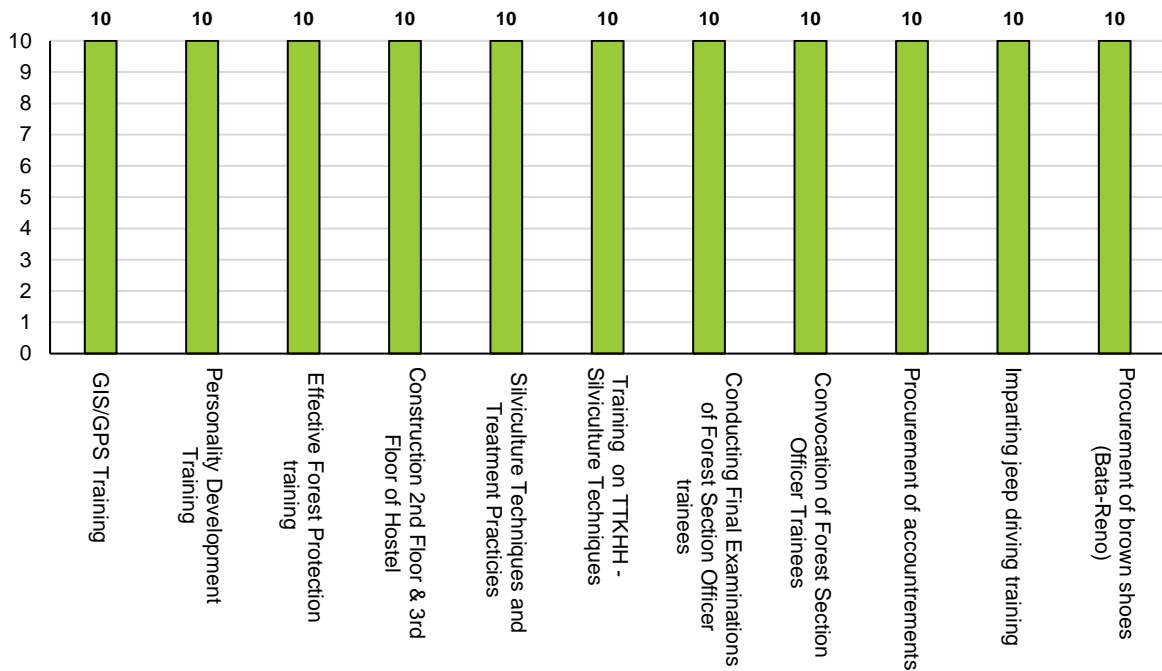
S. No	Division	Range	Activity	Latitude	Longitude	%variation (+/-)	R&D Score	Average score
1	Warangal Urban	FG Warangal-1	Estimate for maintenance of seed godown	17.9901 166	79.540601 67	Less than 10%	10	9.65
2	Warangal Urban	FG Warangal-1	Est. for production of Vermicomposting in RR Wgl-I (WRC) at O/o Forest Geneticist, Warangal during 2015-16	17.9905 722	79.539388 89	Less than 10%	10	
3	Warangal Urban	FG Warangal-1	Est. for Raising of 100000 nos of QPM Misc. RT Nursery at WRC during 2015-16	17.9903 233	79.539616 64	Less than 10%	10	
4	Warangal Urban	FG Warangal-1	Est. for maint. Of seed depulping machine & its repairs and engaging daily wage labour for teak seed depulping at WRC during 2015-16	17.9905 1	79.540476 67	Less than 10%	10	
5	Warangal Urban	FG Warangal-1	Est. for infrastructure development, Erection of chain link fencing around the nursery at WRC O/o Forest Geneticist, Warangal during 2015-16	17.9897 083	79.540221 67	Less than 10%	10	

6	Warangal Urban	FG Warangal-1	Est. for Maintenance of Lab Buildings at O/o Forest Geneticist, Complex, Warangal during 2015-16	17.9906883	79.540315	Less than 10%	10	
7	Warangal Urban	R.R.Warangal-II	Est. for collection of growth data of Research plots at Jakaram R.C. during 2015-16	18.13745	79.86395667	Less than 10%	10	
8	Warangal Urban	R.R.Warangal-II	Est. for Watch & Ward for protection of Jakaram R.C. in day & night time during 2015-16.	18.13745	79.86395667	Less than 10%	10	
9	Warangal Urban	ARC, Achutapuram	Purchase of Farming Equipment's (Tiller, weed cutter device of ARC)	-	-	Less than 10%	10	
10	Warangal Urban	ARC, Achutapuram	Sanitary repairs at forest rest house at ARC	17.2497481	81.04735	Less than 10%	10	
11	Warangal Urban	ARC, Achutapuram	Repair and maintenance of mist chamber	17.2497472	81.04735	21 to 30%	6	
12	Warangal Urban	ARC, Achutapuram	Maintenance and Purchase of Polypropagtons for ARC	17.2498917	81.04755556	Less than 10%	10	
13	SS Hyderabad	FRC-Mulugu	Estimate for raising of 1 lakh no of 100 cc root trainers nursery at FRC Mulugu 2015-16	17.72215	78.62758889	Less than 10%	10	
14	SS Hyderabad	FRC-Dullapally	Estimate for preparation of 100cmt at vermi compost at FRC Dullapally	17.54045	78.46108889	Less than 10%	10	
15	SS Hyderabad	FRC-Mulugu	Estimate for maintenance of various old research plot at FRC Dullapally during year 2015-16	17.7201778	78.63037222	11 to 20 percent	8	
16	SS Hyderabad	FRC Mulug	Estimate for preparation of GI Chain-link mesh at FRC Mulugu	17.7210581	78.63028333	Less than 10%	10	
17	SS Hyderabad	FRC Mulug	Estimate for maintenance of inspection paths/ sector lines at FRC Dullapally			Less than 10%	10	
Total							R&D	9.65
Score								

Findings: FG Warangal having four centers across the state and SS Hyderabad undertook 163 R&D activities under TSFD CAMPA.

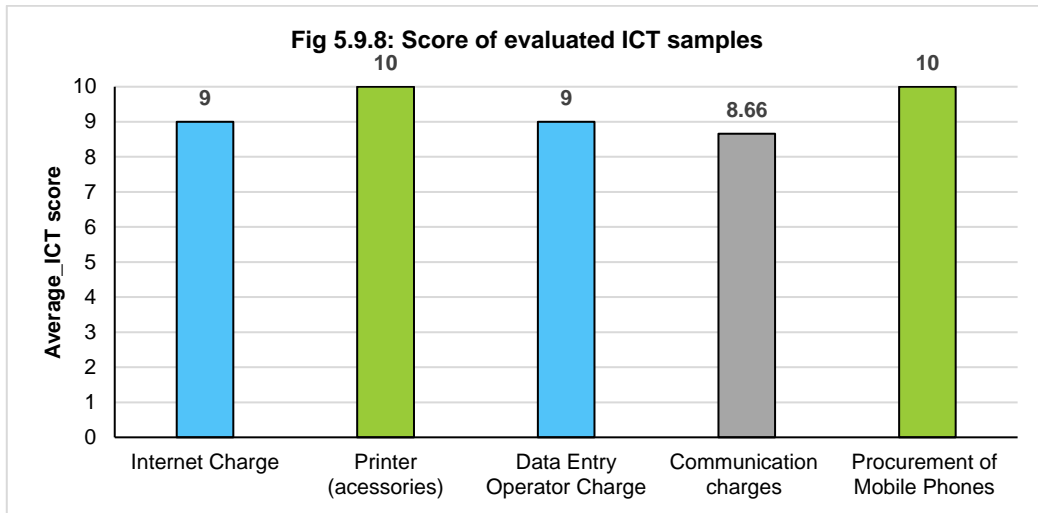
5.9.7 Capacity Building: CB activities were undertaken in Telangana State Forest Academy under CAMPA NPV component during the year 2015-2016. The total number of different works under CB component undertaken by TSFD CAMPA during 2015-2016 is 104. 10% of the total works, 11 samples of CB were evaluated. 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.**

Fig 5.9.7: Score of evaluated CB samples



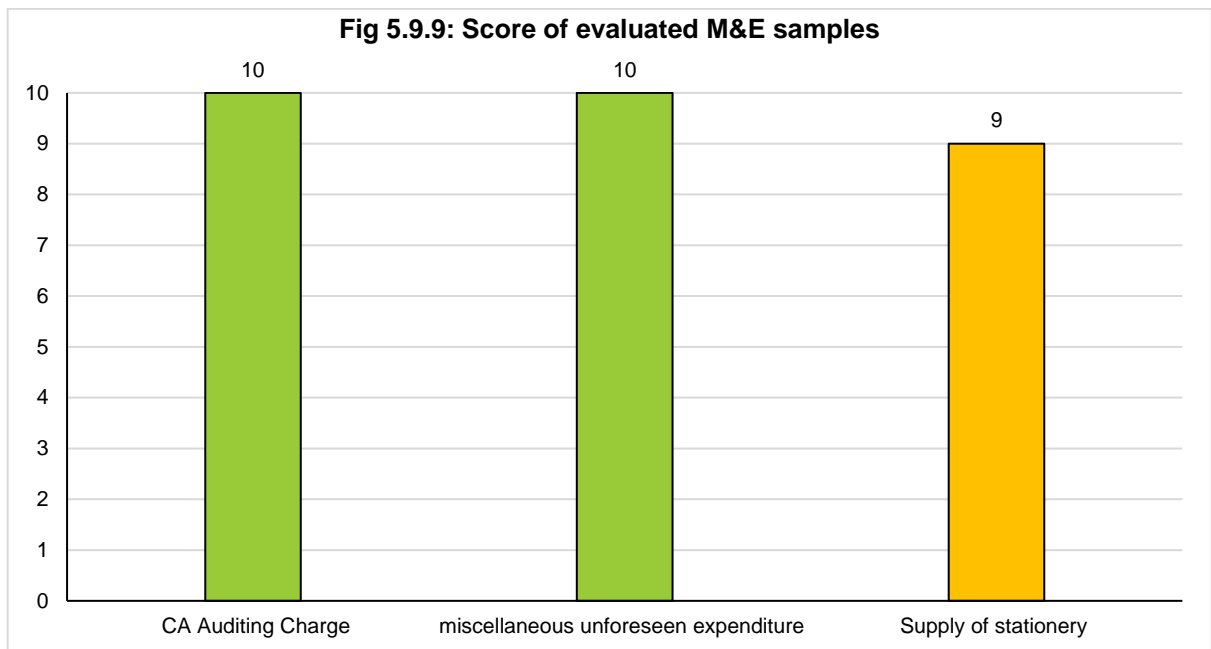
Findings: All the CB activities was undertaken in Telangana State Forest Academy, Dullapally. CB activities full points during evaluation. There are training programmes for forest officials both within and outside the state on nursery raising, plant protection, jeep driving. Infrastructure development 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 2015-2016 is 231. 10% of the total works, 23 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 9.04 out of 10.**



Findings: There were a total of 231 activities undertaken in 2015-2016. ICT was booked under Jannaram WLM, ICT Hyderabad, Warangal North, Karimnagar East and Nirmal. ICT activities was 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 2015-2016 is 81. 10% of the total works, 9 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 9.78 out of 10.**

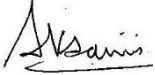

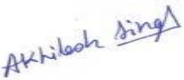



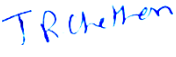





Findings: There were a total of 81 activities under M&E undertaken in 2015-2016. M&E activities evaluated based on the available records indicated highly satisfactory performance.

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 2015-2016 CAMPA activities is **1034.73** out of 1395 i.e. 74.17% indicating “**Moderately satisfactory performance**”.

Table 5.10: Overall scoring of TSFD CAMPA undertaken during 2015-2016.

Quantitative Aspects (A)				Qualitative Aspects (B)			
S.	Main heading	Score	Total	S.	Main heading	Score	Total
I.	Plantation activities (CA and NPV)	228.44	500	I.	Impact of awareness generation campaign	2	5
II	Soil and Water Conservation Measures (CA)	200	200	II.	Identification of approved site for plantation	3	5
II.	Other activities (CA & NFM)	185.53	200	III.	Improvement in quality of wildlife habitat	2	5
III.	Forest Protection	171	200	IV.	CAMPA benefits (SC/ST/BPL households)	10	10
IV	Forest Fire Management	9.29	10	V.	Project Awareness	2	5
V	Biodiversity Conservation	173	200	VI.	Transparency, maintenance and payments	2.5	5
VI	Research & Development	9.65	10	VII.	Maintenance of assets created	7.5	10
VII	Capacity Building	10	10				
VIII	ICT	9.04	10				
IX	Monitoring & Evaluation	9.78	10				
Total (A)		1005.73	1350	Total (B)		29.00	45
Grand Total (A+B)						1034.73	1395

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	

5.9.11 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 understanding on CAMPA components, reporting amongst forest department staffs.
- h) Poorly organized record keeping staffs.

2. Suggestions for improvement

Areas of improving the project output? Specify

- a) Involvement of local stakeholders from site selection to maintenance of 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 to be made available on E-green watch and TGFIMS.

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 and carbon sequestration 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 should be employed for observations, estimation and forecast of the environmental conditions, defining the degree of factors influence resulting in ecosystem changes and estimation of anthropogenic influence resulting in deterioration of the environment. The monitoring should help in the evaluation of biodiversity conservation, climate change and other ecological aspects of CAMPA activities. A system for ecological monitoring should be devised and developed at different tiers of TSFD.

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.

