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 2002[2]. 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 2010-2011 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 2010-2011 are shown in Fig 2.0.

Fig 2.0: Works undertaken for different CA and NPV components during 2010-2011.

Compensatory Afforestation (CA)	Net Present Value (NPV)
➢ Compensatory Afforestation ➢ Safety Zone ➢ Extraction of Tree Growth in diverted areas ➢ Catchment Area Treatment	➢ 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)

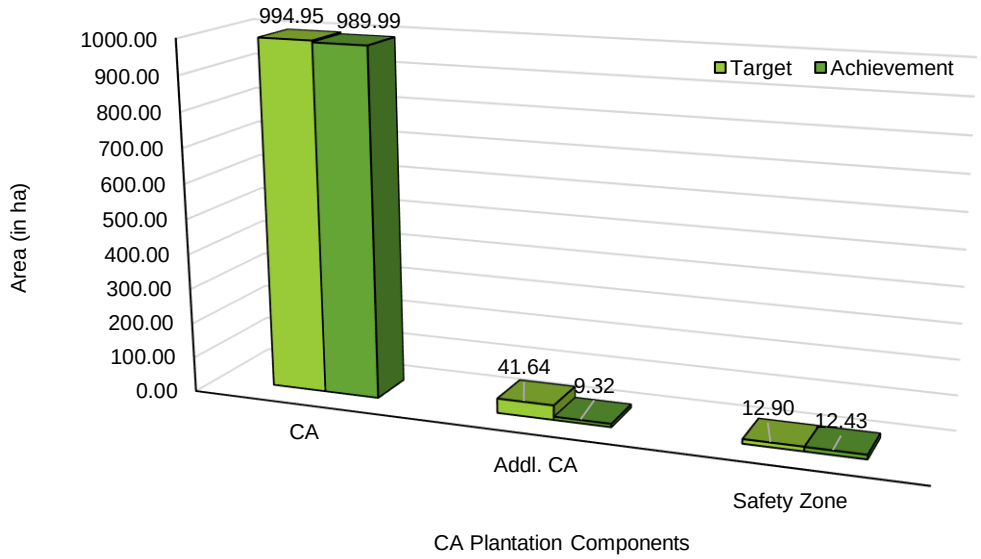
2.1 Compensatory Afforestation (CA): The main mandate of Telangana State CAMPA is afforestation of the compensatory area given by the user agency in lieu of the forest areas diverted for non-forestry purposes. Under Compensatory afforestation, planting of trees is carried out on another piece of land 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 2010-2011, a total of 362 works were undertaken by TSFD with an expenditure of INR 459.672 lakhs. Division wise total number of works and expenditure under CA is shown in Table 2.1a.

Table 2.1a: Division wise expenditure (`lakhs) incurred under CA by TSFD, CAMPA during the year 2010-2011

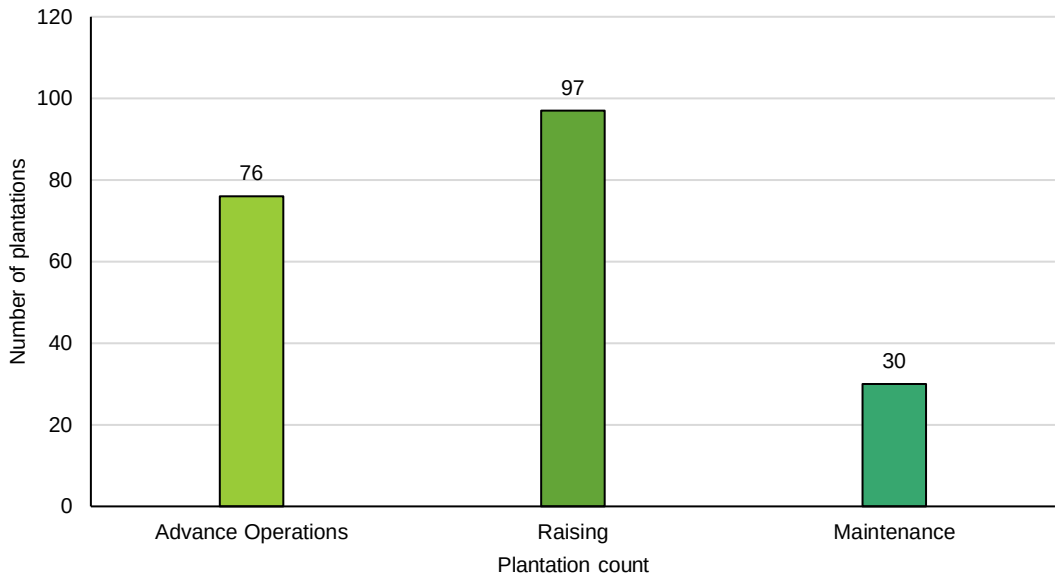
Nam of the Circle	Name of the Division	Target		Achievement	
		Physical (No. of Works)	Financial (lakhs)	Physical (no. of Works)	Financial (lakhs)
Adilabad	Adilabad	13	15	13	34.64
	Mancherial	30	8	30	26.72
	Bellampally	4	0	4	1.39
	Circle total	**47**	**23.00**	**47**	**62.75**
Hyderabad	Hyderabad	4	1	4	1.81
	Mahabubnagar	1	2.795	1	0.79
	Nalgonda	4	17.505	4	37.69
	Circle total	**9**	**21.30**	**9**	**40.29**
Khammam	Khammam	14	2	14	15.05
	Kothagudem	5	21.413	5	4.71
	Paloncha	123	141.208	123	192.40
	Bhadrachalam	51	36.165	51	100.83
	Circle total	**193**	**200.79**	**193**	**312.99**
Nizamabad	Nizamabad	12	9.6	12	4.94
	Kamareddy	6	2.49	6	7.01
	Medak	2	8.54	2	8.15
	Circle total	**20**	**20.63**	**20**	**20.11**
Warangal	Warangal (N)	0	7.627	0	0.00
	Karimnagar (E)	4	6.302	4	1.07
	Circle total	**4**	**13.93**	**4**	**1.07**
FDPT Srisailam	Achampet	89	15.504	89	22.469
	Circle total	**89**	**15.504**	**89**	**22.469**
GRAND TOTAL		**362**	**295.1512**	**362**	**459.672**

Fig 2.1.a: Plantation targets and achievements under CA during 2010-11



During 2010-2011, targets under CA plantations was 1049.49 ha, out of which 1011.74 ha was achieved in Telangana. 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 2010-2011 is shown in Fig 2.1b.

Fig. 2.1b: Total plantation works carried out under CA during 2010-2011



Division wise total number of plantation works under CA for the year 2010-2011 is shown in Table 2.1b. Under CA other activities, extraction of tree growth in diverted areas and development of soil and water conservation measures were undertaken during 2010-2011.

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, infrastructure development and office support. Each of the NPV components is described in the following sub-sections.

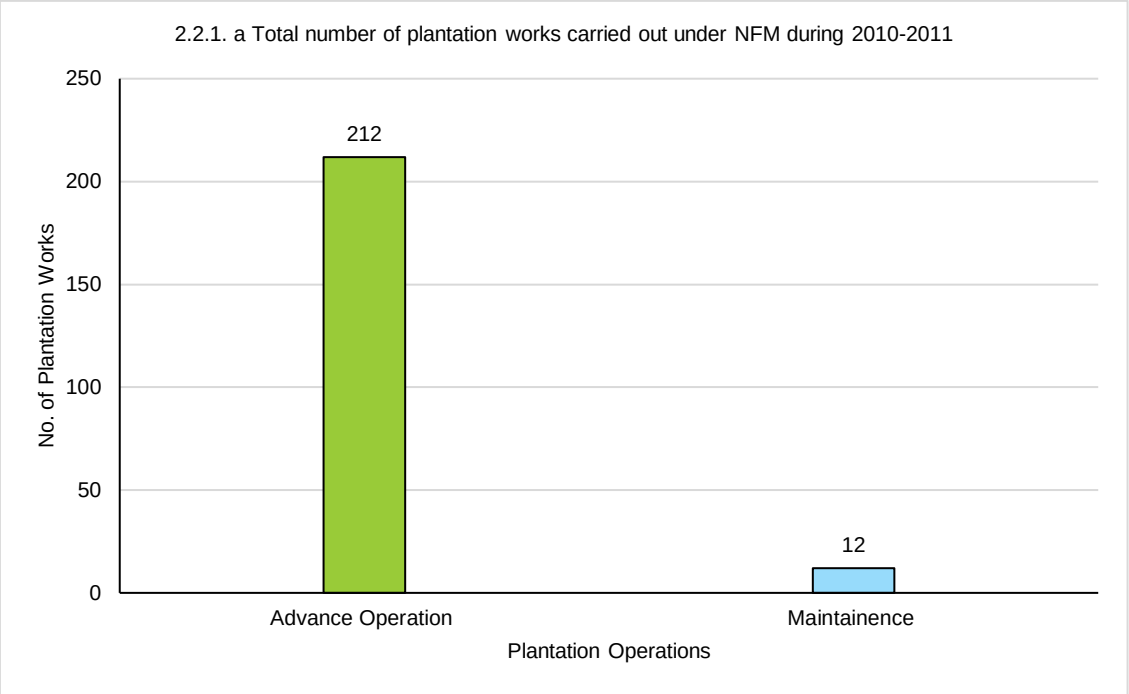
2.2.1 Natural Forest Management (NFM): The purpose of natural forest management treatments is to improve the overall stockings of the natural forests and at the same time to afforest degraded forest areas and improve the productivity of the forests on a sustained yield basis by using appropriate silvicultural 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. However, no raining of NFM plantations

were carried out during the FY 2010-11, only advance operations and maintenance works were carried out. Division wise targets and achievements under NFM for the year 2010-2011 is shown in Table 2.2.1.a.

Table 2.2.1.a: Division wise physical works (No. of Works) and expenditure (lakhs) abstract of NFM under TSFD, CAMPA for the year 2010-2011.

Name of the Circle	Name of the Division	Target		Achievement	
		Physical (No. of Works)	Financial ('lakhs)	Physical (No. of Works)	Financial ('lakhs)
Adilabad	Adilabad	21	33	21	21.28
	Nirmal	14	33.75	14	22.84
	WL Jannaram	5	8.5	5	3.65
	Mancherial	63	89.5	63	103.446
	Bellampally	36	101.25	36	141.442
	Kagaznagar	8	43	8	25.051
	Circle-total	147	**309**	147	**317.709**
Hyderabad	Hyderabad	11	55.5	11	26.272
	Mahabubnagar	10	18.5	10	9.094
	Nalgonda	22	18.5	22	7.716
	Circle-total	43	**92.5**	43	**43.082**
Khammam	Khammam	39	42.5	39	44.635
	Kothagudem	9	28.5	9	11.467
	Paloncha	7	38.5	7	20.341
	Bhadrachalam	10	53	10	77.132
	WL Paloncha	0	22	0	0
	Circle-total	65	**184.5**	65	**153.575**
Nizamabad	Nizamabad	13	10	13	6.061
	Kamareddy	6	10	6	3.644
	Medak	10	148	10	113.263
	Circle-total	29	**168**	29	**122.968**
Warangal	Warangal (N)	13	46.25	13	24.61
	Warangal (S)	3	27.75	3	3.558
	Karimnagar (E)	14	46.25	14	17.287
	Karimnagar (W)	16	27.75	16	13.35
	Circle-total	46	**148**	46	**58.805**
FDPT Srisailam	Achampet	2	32	2	6.788
	Circle-total	**2**	**32**	**2**	**6.788**
GRAND TOTAL		**332**	**934**	**332**	**702.927**

No plantations were raised under the NFM component during the year 2010-11. Total number of plantation works carried out under NFM during 2010-2011 is shown in Fig 2.2.1.a.



Division wise total number of plantation works under NFM for the year 2010-2011 is shown in Table 2.2.1.b.

Table 2.2.1.b: Total plantation works undertaken under NFM by TSFD, CAMPA during 2010-11.

Division	Advance Operation	Maintenance	Total
Adilabad	24	-	**24**
Bellampally	11	-	**11**
Bhadrachalam(North)	2	10	**12**
Bhadrachalam(South)	2	-	**2**
Hyderabad	7	-	**7**
Jannaram	4	-	**4**
Kagaznagar	7	-	**7**
Karimnagar East	9	-	**9**
Karimnagar West	13	-	**13**
Khammam	2	-	**2**
Kothagudem	7	-	**7**
Mahabubnagar	50	-	**50**
Mancherial	42	-	**42**
Nalgonda	8	2	**10**
Nirmal	12	-	**12**
Warangal North Division	11	-	**11**
Warangal South Division	1	-	**1**
Total	**212**	**12**	**224**

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 2200.03 lakh was spent for completing the proposed interventions, the amount also includes spillover works of the year 2010-2011. Activities carried out under FP during 2010-2011 include:

- Base Camps (81 base camps) activities with highest in Adilabad circle (30 base camps).
- Forest Strike Forces (38 no.) activities towards establishment and maintenance.
- Strengthening and maintenance of 51 check posts.
- Translation, scanning, and documentation of Reserve Forest Blocks notifications.
- Construction of protection wall in urban forest areas.
- Improvement of communication network and mobility for patrolling duty to frontline forest staff.
- Providing arms and ammunition to the frontline staffs.
- Legal assistance charges.

Division wise targets and achievements under FP for the year 2010-2011 is shown in Table 2.2.2.

Table 2.2.2: Division wise physical works (numbers) and expenditure (`lakhs) abstract of FP under TSFD, CAMPA for the year 2010-2011.

Name of the Circle	Name of the Division	Sanctioned Cost		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Adilabad	Adilabad	42	63.99	42	34.8254
	Nirmal	41	66.47	41	40.213
	WL Jannaram	19	44.29	19	25.2452
	Mancherial	23	41.63	23	25.275
	Bellampally	38	44.03	38	27.291
	Kazagnagar	26	36.13	26	25.013
	Circle-total	189	296.54	189	177.8626
Hyderabad	Hyderabad	56	253.56	56	1557.445
	Mahabubnagar	12	72.7	12	18.927
	Nalgonda	24	26.06	24	14.238
	FSP Hyderabad	4	4.5	4	4.605
	Circle-total	96	356.82	96	1595.215
Khammam	Khammam	58	46.13	58	22.478
	Kothagudem	20	40.53	20	30.288
	Paloncha	24	43.75	24	25.597
	Bhadrachalam (N)	24	36.25	24	21.625
	Bhadrachalam (S)	53	48.05	53	32.91
	WL Paloncha	19	27.05	19	12.106
	Circle-total	198	241.76	198	145.00
Nizamabad	Nizamabad	76	37.93	76	17.832
	Kamareddy	25	33.97	25	18.65
	Medak	27	28.54	27	25.731
	WL Medak	7	18.27	7	4.574
	Circle-total	135	118.71	135	66.79
Warangal	Warangal (N)	44	54.25	44	37.523
	Warangal (S)	37	47.41	37	32.96
	WL Warangal	13	28.41	13	10.632
	Karimnagar (E)	27	46.845	27	39.069
	Karimnagar (W)	33	50.89	33	40.659
	Circle-total	154	228.23	154	160.843
FDPT Srisailam	Achampet	75	46.49	75	42.883
	Circle-total	75	46.49	75	42.883
WLM Hyderabad	CNP	3	104.35	3	4.478
	WLM Hyderabad	19	17.4	19	6.958
	Circle-total	22	121.75	22	11.436
GRAND TOTAL		**869**	**1410.088**	**869**	**2200.03**

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 55.992 lakh was spent on interventions under this component. Major activities under FFM during 2010-2011 includes:

- Creation of new fire lines in Telangana during 2010-11 (336.47 km) out of which Nizamabad Circle stood on top (105 Km).
- Maintenance of 675 km of existing fire lines.
- Creation of 4 new fire watchtower at WLM Medak (1nos.) and Achampet (3 nos.).

Division wise targets and achievements under FFM for the year 2010-2011 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 2010-2011.

Circle	Division	Sanctioned Cost		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Adilabad	Adilabad	0	14.20	0	0
	Nirmal	2	6.94	2	0.504
	Jannaram WL	4	7.96	4	2.63
	Mancherial	12	7.33	12	3.78
	Bellampally	13	15.28	13	7.92
	Kagaznagar	6	7.39	6	2.88
	Circle-total	**37**	**59.1**	**37**	**17.714**
Hyderabad	Hyderabad	49	11.74	49	7.742
	Mahabubnagar	18	2.71	18	1.2
	Nalgonda	7	2.47	7	1.2
	Circle-total	**74**	**16.92**	**74**	**10.142**
Khammam	Khammam	3	6.4	3	0.517
	Kothagudem	5	7.9	5	1.26
	Paloncha	0	6.40	0	0
	WL Paloncha	0	5.80	0	0
	Bhadrachalam (North)	3	8.2	3	0.271
	Bhadrachalam (South)	7	8.2	7	1.05
	Circle-total	**18**	**42.9**	**18**	**3.098**
Nizamabad	Nizamabad	12	3.56	12	2.861
	Kamareddy	12	3.08	12	1.682
	Medak	1	3.38	1	1.797
	Medak WLM	4	5.01	4	3.928
	Circle-total	**29**	15.03	**29**	10.268
Warangal	Warangal (North)	1	6.34	1	0.98
	Warangal (South)	5	6.04	5	0.44
	Warangal WLM	9	6.1	9	0.904
	Karimnagar (East)	5	6.34	5	1.2
	Karimnagar (West)	4	6.34	4	0.48
	Circle-total	**24**	31.16	**24**	4.004
FDPT	Achampet	13	14.8	13	8.842
	Circle-total	**13**	**14.8**	**13**	**8.842**
WLM Hyderabad	DFO Hyderabad	0	4.90	0	0
	CNP	1	4.66	1	1.924
	Circle-total	**1**	**9.56**	**1**	**1.924**
Grand Total		**196**	**189.47**	**196**	**55.992**

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 2010 - 2011 an expenditure of 269.196 lakhs was made by TSFD. Initiatives for the conservation of biodiversity and development in the National Parks and Protected Areas undertaken by TSFD during 2010-2011 are listed below:

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

Division wise targets and achievements under BDC for the year 2010-2011 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 2010-2011.

Name of the Circle	Name of the Division	Target		Achievement	
		Physical (nos.)	Financial ('lakhs)`	Physical (nos.)	Financial ('lakhs)
Adilabad	Nirmal	1	0	1	0.98
	WL Jannaram	17	45	17	18.667
	Mancherial	4	20.5	4	10.08
	Circle-total	**22**	**65.5**	**22**	**29.727**
Hyderabad	Hyderabad	1	0	1	0.281
	Mahabubnagar	5	65	5	10.15
	Nalgonda	1	0	1	0.41
	Circle-total	**7**	**65**	**7**	**10.841**
Khammam	Bhadrachalam (S)	7	0	7	2.44
	WL Paloncha	35	53	35	15.013
	Circle-total	**42**	**53**	**42**	**17.453**
Nizamabad	Nizamabad	15	3	15	3.042
	Kamareddy	36	3.5	36	3.346
	Medak	4	4.5	4	5.036
	WL Medak	38	53	38	51.537
	Circle-total	**93**	**64**	**93**	**62.961**
Warangal	Warangal (N)	13	19	13	9.847
	Warangal (S)	7	3	7	1.843
	WL Warangal	7	46.5	7	3.408
	Karimnagar (W)	8	15.5	8	5.626
	Circle-total	**35**	**84**	**35**	**20.724**
FDPT Srisailam	Achampet	28	27	28	16.279
	Circle-total	**28**	**27**	**28**	16.279
WLM Hyderabad	CNP	65	91	65	66.675
	D.F.O	11	33	11	20.174
	Circle-total	**76**	**124**	**76**	**86.849**
Zoo Park	Zoo Park	3	106	3	24.362
	Circle-total	**3**	**106**	**3**	24.362
GRAND TOTAL		**306**	**588.5**	**310**	**269.196**

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 89.62976 lakhs was spent under this component during 2010-2011. The major interventions include

- Strengthening of existing infrastructure,
- Tree breeding activities and documentation,
- Clonal forestry research,
- Seed technology,
- Domestication of indigenous fast-growing species,
- Tissue culture seedlings,
- Improvement of nursery technology, production of quality planting material, and
- Standardization of Natural Forest Management models.

Division wise targets and achievements under R&D for the year 2010-2011 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 2010-2011.

Nam of the Circle	Name of the Division	Target		Achievement	
		Physical (nos.)	Financial ('lakhs)`	Physical (nos.)	Financial ('lakhs)
R&D	SS Hyderabad	80	43.93891	80	42.27076
	FG WGL	156	52.44	156	47.359
	Circle-total	236	96.37891	236	89.62976
GRAND TOTAL		**236**	**96.37891**	**236**	**89.62976**

2.2.6 Capacity Building (CB): The Forest Academy, Dullapaly 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 155.610 lakhs is provided under the component for the following activities:

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

Division wise targets and achievements under CB for the year 2010-2011 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 2010-2011.

Name of the Circle	Name of the Division	Capacity Building			
		Target		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
APFA Dullapally	Dullapally	90	514.786	90	155.17779
	FUO Hyderabad	1	0.44	1	0.44
Grand total		**91**	**515.226**	**91**	**155.610**

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

forest cover. The information obtained from the satellite imageries are analyzed and areas prone for 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 261.434 lakhs has been spent in this component. Division wise targets and achievements is shown in Table 2.2.7. Major interventions under ICT component during 2010-11 includes:

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

Table 2.2.7: Division wise ICT works (numbers) and expenditure (` lakhs) during the year 2010-2011.

Name of the Circle	Name of the Division	Target		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Adilabad	Adilabad	1	0	1	0.075
	Nirmal	1	0	1	0.92
	Mancherial	1	0	1	0.255
	Bellampally	1	0	1	0.234
	Circle-total	**4**	**0**	**4**	**1.484**
Hyderabad	Hyderabad	51	14.321	51	258.819
	Circle-total	**51**	**14.321**	**51**	**258.819**
Warangal	Warangal (N)	1	0	1	0.19
	Warangal (S)	1	0	1	0.281
	Karimnagar (E)	2	0	2	0.276
	Karimnagar (W)	1	0	1	0.384
	Circle-total	**5**	**0.24**	**5**	**1.131**
GRAND TOTAL		**60**	**14.441**	**60**	**261.434**

2.2.8 Office Support (OS): Office support activities were undertaken for effective and proper maintenance of offices and implementation of various schemes. Contractual technical and other staff for office support, AMC charges, Electricity and water charges, office stationery and other miscellaneous expense, CA audit fee are included under OS by Telangana state. An amount of 344.826 lakhs has been spent under this component. Division wise targets and achievements under O&S for the year 2010-2011 is shown in Table 2.2.8.

- Office support (Office Stationery)
- Water and electricity charges

Table 2.2.8: Division wise physical works (numbers) and expenditure (` lakhs) abstract of OS under TSFD, CAMPA for the year 2010-2011.

Name of the Circle	Name of the Division	Target		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Adilabad	Adilabad	15	1.7	15	5.7333
	Nirmal	3	1.7	3	2.731
	WL Jannaram	1	1.5	1	2.1
	Mancherial	6	1.7	6	2.703
	Bellampally	1	1.7	1	2.104
	Kazagnagar	3	1.7	3	2.4867
	Circle-total	**29**	**10**	**29**	**17.858**

Name of the Circle	Name of the Division	Target		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Hyderabad	Hyderabad	89	3.5	89	192.881
	Mahabubnagar	2	3	2	3.658
	Nalgonda	7	2.5	7	2.636
	FSP Hyderabad	1	0	1	0.151
	Circle-total	**99**	**9**	**99**	**199.326**
Khammam	Khammam	12	1.5	12	4.854
	Kothagudem	10	1	10	1.314
	Paloncha	25	1	25	1.37
	Bhadrachalam (N)	54	2.25	54	2.434
	Bhadrachalam (S)	5	2.25	5	2.4
	WL Paloncha	1	1	1	0.144
	Circle-total	**107**	**9**	**107**	**12.516**
Nizamabad	Nizamabad	15	2.5	15	4.1135
	Kamareddy	28	2	28	3.272
	Medak	3	1.75	3	4.89269
	WL Medak	3	0.75	3	0.825
	Circle-total	**49**	**7**	**49**	**13.10319**
Warangal	Warangal (N)	3	2	3	3.27
	Warangal (S)	2	2	2	0.599
	WL Warangal	2	0.5	2	0.396
	Karimnagar (E)	5	1.5	5	2.279
	Karimnagar (W)	6	2	6	1.36
	Circle-total	**18**	**8**	**18**	**7.903**
FDPT Srisailam	Achampet	10	2	10	1.6343
	Circle-total	**10**	**2**	**10**	1.6343
WLM Hyderabad	CNP	8	2.5	8	1.5
	D.F.O	6	2.5	6	1.815
	Circle-total	**14**	**5**	**14**	**3.315**
R&D	SS Hyderabad	6	0	6	2.43532
	FG WGL	3	0	3	0.619
	FUO Hyderabad	5	0	5	0.026
	Circle-total	**14**	**0**	**14**	**3.08032**
AO IV	AO IV	-	0	-	86.09067
	Circle-total	**-**	**0**	**-**	**86.09067**
GRAND TOTAL		**340**	**50**	**340**	**344.826**

2.2.9 Infrastructure Development & Maintenance (ID&M): Infrastructure of the department needs considerable improvement and upgradation for effective implementation of the various developmental schemes. An amount of 223.66 lakhs has been spent under this component. Division wise targets and achievements under ID&M for the year 2010-2011 is shown in Table 2.2.9. Special steps were taken to develop the infrastructure and facilities for the frontline staff who are mostly located in interior forest areas. The interventions like improving office and residential infrastructure at various levels were taken up under this scheme. In short the department to achieve the overall objective to protect and regenerate the forests and wildlife habitats. Intervention undertaken under ID&M by Telangana state CAMPA during 2010-11 are as follows:

a) Construction of Front line staff residential quarter, FG Qtr. & AFBO Qtrs.

b) Construction of residential quarters at State Head Quarters

c) Office Buildings maintenance

d) Residential Quarters maintenance

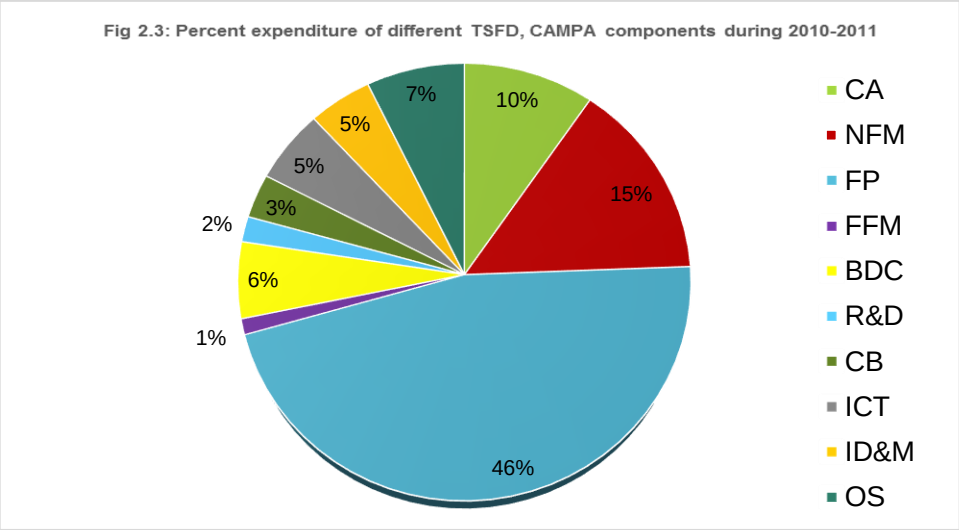
f) Maintenance of Rest House for monitoring forestry works

Table 2.2.9: Division wise physical works (numbers) and expenditure (` lakhs) abstract of ID&M under TSFD, CAMPA for the year 2010-2011.

Name of the Circle	Name of the Division	Target		Expenditure	
		Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Adilabad	Adilabad	13	74.05	13	13.335
	Nirmal	14	76.25	14	27.875
	WL Jannaram	7	74.05	7	15.678
	Mancherial	11	74.05	11	20.883
	Bellampally	18	62.05	18	16.532
	Kazagnagar	11	74.55	11	2.552
	Circle-total	74	435	74	96.855
Hyderabad	Hyderabad	31	52.5	31	35.072
	Mahabubnagar	12	30	12	6
	Nalgonda	9	16.5	9	4.789
	Circle-total	52	99	52	45.861
Khammam	Khammam	4	39	4	11.96
	Kothagudem	5	25	5	4.745
	Paloncha	4	37	4	8.62
	Bhadrachalam (N)	3	37.5	3	19.457
	Bhadrachalam (S)	12	47.5	12	7.805
	Circle-total	28	186	28	52.583
Nizamabad	Nizamabad	3	5	3	3
	Kamareddy	7	15.5	7	6.375
	Medak	5	28.5	5	13.837
	WL Medak	4	1	4	0.93
	Circle-total	19	50	19	24.142
Warangal	Karimnagar (E)	7	51.5	7	1.968
	Karimnagar (W)	6	40	6	0.25
	Circle-total	13	91.5	13	2.218
FDPT Srisailam	Achampet	1	28	1	2
	Circle-total	1	28	1	2
GRAND TOTAL		**187**	**889.5**	**187**	**223.666**

2.3 Targets and Achievements of CAMPA components during 2010-2011:

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 2010-11 under A.P. State CAMPA, as Telangana state was a part of AP state in 2010-2011. 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 2010-2011.

CAMPA Components	Target		Achievements	
	Physical (no.)	Financial (`lakhs)	Physical (no.)	Financial (`lakhs)
Compensatory Afforestation **(CA)**	362	295.1512	362	459.672
Natural Forest Management **(NFM)**	332	934	332	702.927
Forest Protection **(FP)**	869	1410.088	869	2200.03
Forest Fire Management **(FFM)**	196	189.47	196	55.992
Biodiversity Conservation and Development **(BDC)**	306	588.5	306	269.196
Research & Development **(R&D)**	236	96.37891	236	89.62976
Capacity Building **(CB)**	91	515.226	91	155.610
Information & Communication Technology **(ICT)**	60	14.441	60	261.434
Infrastructure Development & Maintenance **(ID&M)**	187	889.5	187	223.666
Office Support **(OS)**	340	50	340	344.826
TOTAL	**2979**	**4982.75511**	**2979**	**4762.98276**

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]

[9]AP State CAMPA, APO for the year 2010-2011

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-2014[11] 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 2010-2011.
2. To evaluate the survival and health of plantations carried out under the CAMPA Scheme in Telangana State Forest department for the year 2010-2011 with photographic evidence.
3. To evaluate the other activities carried out by Telangana State Forest Department for the year 2010-2011 with photographic evidence.

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

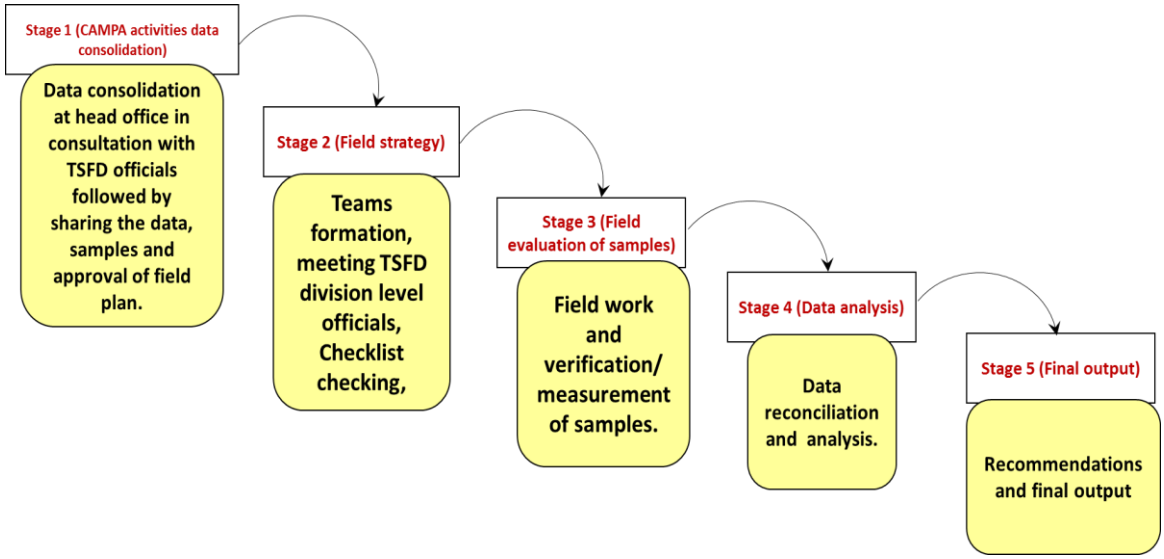


Fig 4.1: Process flow of third party CAMPA evaluation.

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).

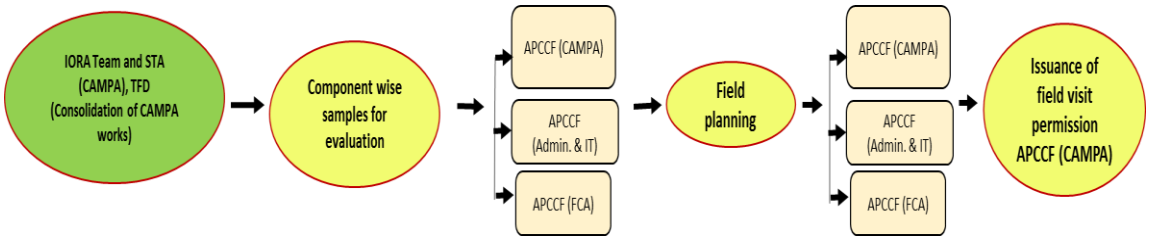


Fig 4.1.1: Flow chart of Stage 1 - CAMPA activities data consolidation.

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 2010-2011. The list of data sources reviewed for consolidation of CAMPA list of works for 2010-2011 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 STA 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 2010-2011
5) List of works 2010-2011 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 2010-2011 was collected. A total of 2958 works (*Part B*) were undertaken in the state of Telangana under CAMPA during 2010-2011. 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, 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 2010-2011. 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 available[12].

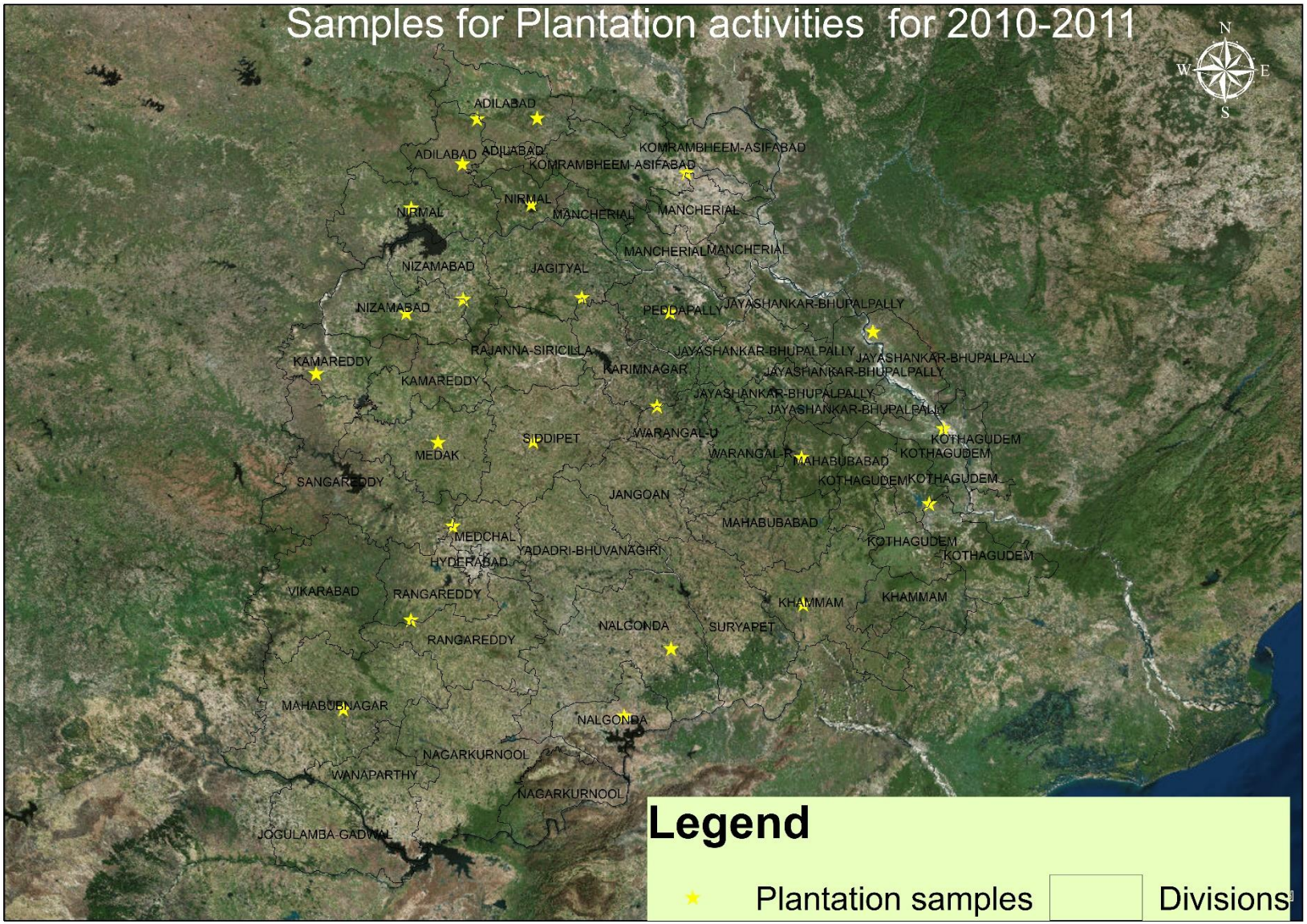
[12]National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

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 field enumeration adhering NWPC-2014 guidelines. The detail sample list (10 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 (2010-2011) for 3rd party evaluation.

Forest Divisions	Advance Operation		Raising	Nursery		Total
	CA	NFM	CA	CA	NFM	
Achampet		-	1	-	-	1
Adilabad	-	1	2	-	-	3
Bhadrachalam	-	-	1	-	-	1
Bhupalpally	1	-	-	-	-	1
Chennur	-	-	1	-	1	1
FG Warrangal	-	-	-	-	1	1
Jagtial	-	2	1	-	-	3
Kamareddy	1	-	-	-	-	1
Kothagudem	-	1	-	-	-	1
Mahbubabad	-	1	-	-	-	1
Manuguru	-	-	-	5	-	5
Nalgonda	-	1	1	-	-	3
Nirmal	-	1	-	-	-	1
Pedapally	-	3	1	-	-	4
Sathupally	1	1	-	-	-	2
Siddipet	-	1	-	-	-	1
Sircilla	-	2	-	-	-	2
Utnoor FDPT	-	3	-	-	-	3
Wanaparthy	-	1	-	-	-	1
Yellandu	1	1	-	-	-	2
Total	**4**	**19**	**8**	**5**	**2**	**38**

Map 4.1.1a: Map showing plantation activities samples evaluated for 3rd party evaluation during 2010-11.

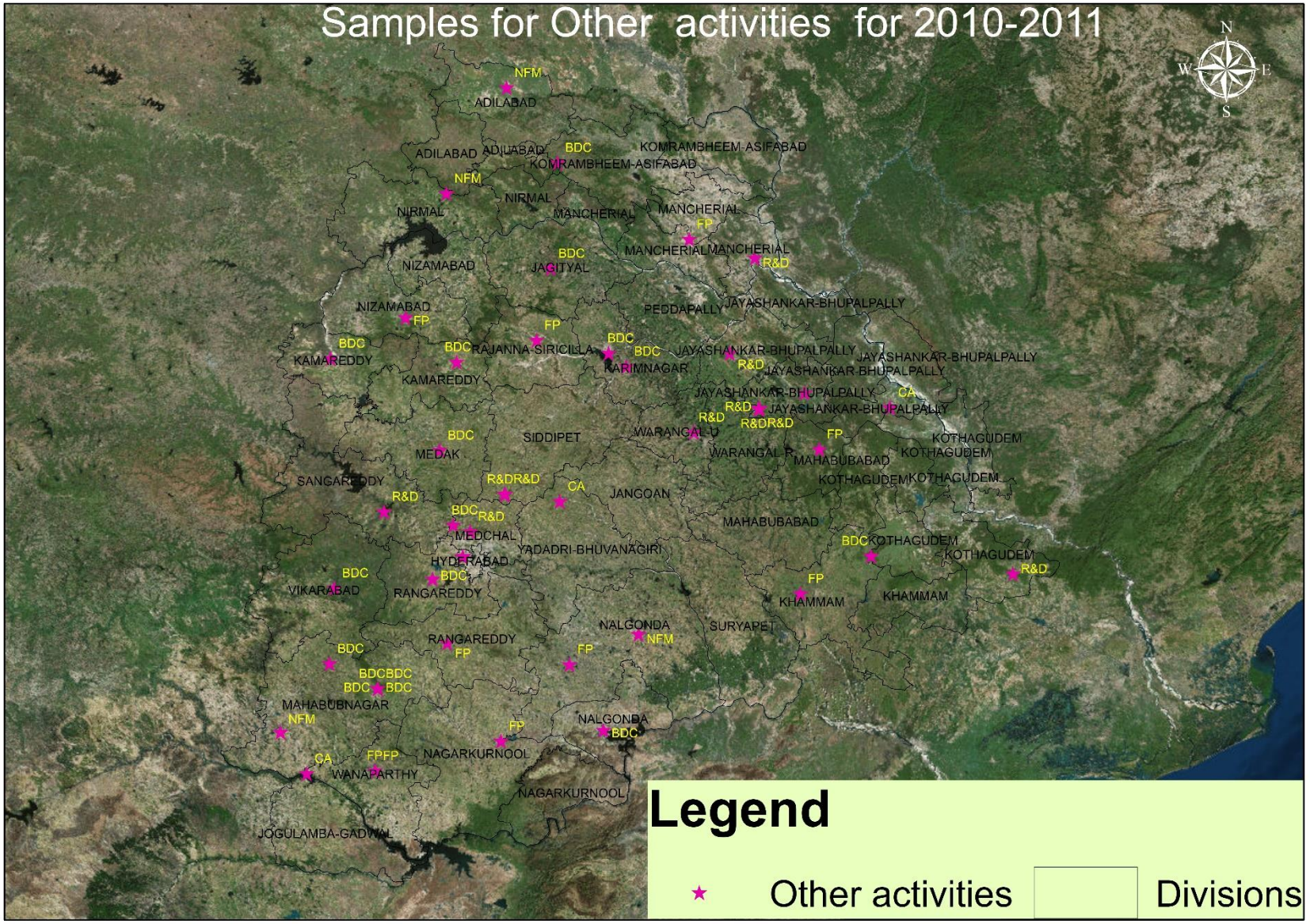


4.1.1.1.2 Sampling of other activities: For sampling other activities, the consolidated list of works of all the other activities undertaken by TSFD CAMPA during the year 2010-2011 was sorted. The sorted list was segregated into different CAMPA components. Sampling design tool, an add-on of ArcGIS 10.3 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 (259 no.) of other activities is given in Annexure VI. Division wise number of samples of other activities under different CAMPA components namely, CA, NFM, FP, FFM, IDM, ICT, BDC, M&E, R&D, and OC is shown in table 4.1.1b and map 4.1.1.b.

Table 4.1.1b: Division wise number of samples for 3rd party evaluation of other activities under different CAMPA components for the year 2010-2011.

Division	CA	NFM	BDC	FP	FFM	CB	ICT	R&D	IDM	OS	Total Works
Achampet	4	1	2	10	-	-	-	-	-	3	17
Adilabad	1	1	-	7	-	-	1	-	4	9	23
Amrabad	-	-	4	3	-	-	-	-	-	-	7
Asifabad	-	-	-	7	1	-	-	-	2	1	11
Banswada	-	-	-	-	-	-	1	-	-	-	1
Bellampally	-	2	-	-	-	-	-	-	1	1	4
Bhadrachalam	6	1	-	1	3	-	-	-	2	1	14
Bhupalpally	-	-	-	6	1	-	-	-	-	-	7
Chennur	-	-	-	1	-	-	-	-	1	-	2
Echoda	-	-	-	10	-	-	-	-	-	1	11
FG Warrangal	-	-	-	-	-	-	-	19	-	-	19
Hyderabad	-	-	3	-	1	-	-	-	-	-	4
Jagtial	-	-	-	-	1	-	-	-	-	-	1
Jannaram	-	1	5	1	-	-	-	-	-	2	9
Kagaznagar	-	-	-	1	-	-	-	-	3	-	4
Karimnagar	-	2	2	2	1	-	-	-	-	3	10
Khammam	2	-	-	2	-	-	-	-	-	2	7
Khanapur	-	-	-	2	-	-	1	-	1	-	4
Kothagudem	-	-	-	2	1	-	-	-	-	2	5
Mahbubabad	-	-	1	3	1	-	-	-	-	-	5
Mancherial	1	2	-	-	-	-	-	-	1	-	3
Medak	-	-	1	-	1	-	-	-	-	-	2
Medak WLM	-	-	6	-	-	-	-	-	-	-	6
Medchal	-	-	-	-	-	-	-	-	1	-	1
N. Sagar WLM	-	-	1	1	1	-	1	-	-	1	5
Nalgonda	1	-	-	1	1	-	-	-	-	-	3
Nirmal	-	1	-	2	-	-	-	-	-	-	3
Nirmal	-	-	-	1	-	-	-	-	-	-	1
Nizamabad	2	-	-	-	-	-	-	-	-	-	2
Paloncha	-	-	-	2	-	-	1	-	1	1	5
Pedapally	-	-	-	3	-	-	-	-	-	-	3
Sathupally	-	-	-	1	-	-	-	-	-	-	1
Shamshabad	-	-	-	1	-	-	-	-	-	-	1
Siddipet	-	-	-	-	-	-	-	-	-	1	1
Sircilla	-	1	-	1	1	-	-	-	-	-	3
SS Hyderabad	-	-	-	-	-	-	-	5	-	1	6
TSFA, Dullapally	-	-	-	-	-	9	-	-	-	-	9
Utnoor	-	-	-	3	-	-	-	-	-	1	4
Venkatapuram	-	-	-	2	-	-	-	-	-	-	2
Vikarabad	-	-	-	1	1	-	-	-	-	-	2
Warrangal WLM	-	-	1	-	1	-	-	-	-	-	2
WLM Hyderabad	-	-	-	-	-	-	-	-	-	1	1
WLM Paloncha	-	-	4	-	1	-	-	-	-	1	6
Yadadri Bhuwangiri	2	1	1	10	3	-	1	-	1	2	21
YELLANDU	-	-	-	-	-	-	-	-	1	-	1
Grand Total	**19**	**13**	**31**	**87**	**20**	**9**	**6**	**24**	**19**	**34**	**259**

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 II*). Field staff of the forest divisions to be visited were requested to be present during evaluation along with Measurement Book, Plantation Journal, CAMPA works register, and other information to facilitate smooth completion of the evaluation. As per the Rc.No.3037/2017/CAMPA dated 30.05.2017 issued by PCCF, TSFD the DFOs/FDOs (*Annexure III*) shall ensure concern field staff should be present and show the plantation site or other works taken up for CAMPA. The plantation journal, measurement books, estimate, list of works in Division/Range should be made available to the evaluation team.

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

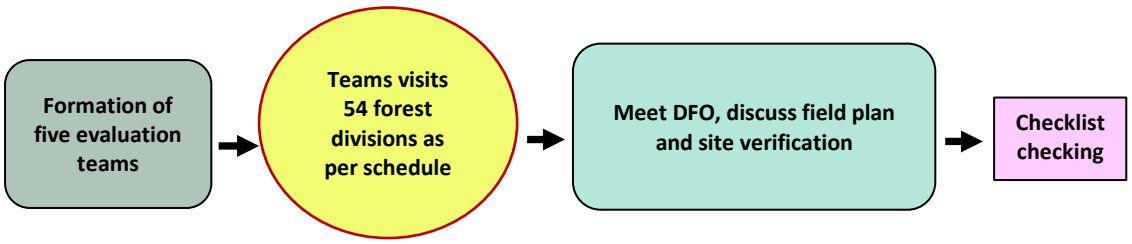


Fig 4.1.2: Flow chart of Stage 2 - Field strategy.

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

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

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

4.1.3.1 Meeting TSFD officials

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

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

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

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

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

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

4.1.4.2 Data reconciliation

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

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

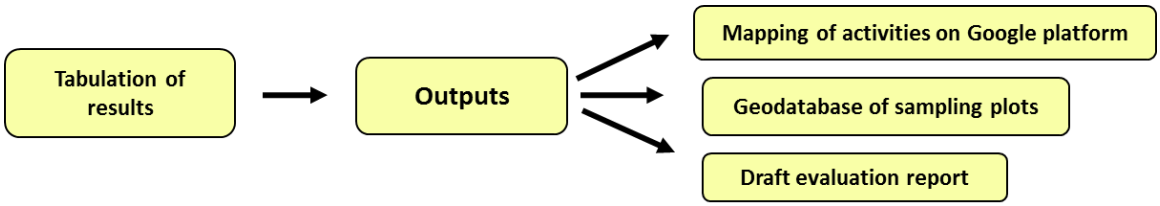


Fig 4.1.5: Flow chart of Stage 5 – Final output.

4.1.5.1 Tabulation of results

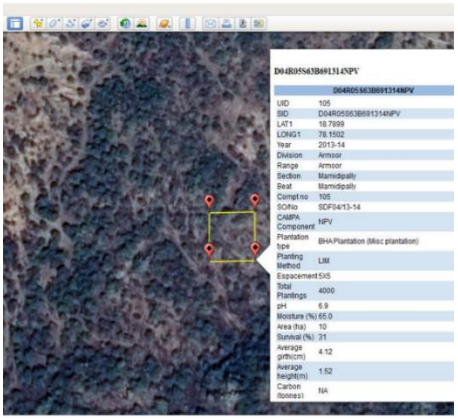
a) Analyzed results were tabulated separately for divisions, species, plantation types, activities.

b) Matched field data collected and data digitized.

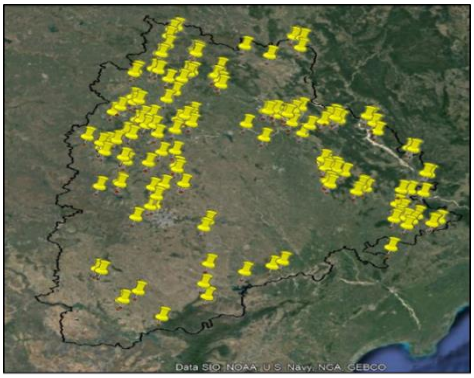
c) Field data digitization and consolidated at the division level for 2010-2011.

4.1.5.2 Outputs

a) Geodatabase created of all sampled plantation plots (*file CAMPA_2010_2011_field_plantation_samples.kmz*)



b) All activities mapped using Arc GIS and exported to Google earth platform (*file CAMPA other activities samples_2010-2011.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 scrutinizing 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 ha[13] (*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 45^0 in north-east, at 135^0 in the south-east, at 225^0 in the south-west, and at 315^0 in north-west corners of the plot from true north. The dimensions of the plot, i.e. one side measured 31.62 m horizontal distance. Latitude and longitude of all the sample plots of plantations are shown in Annexure VII.

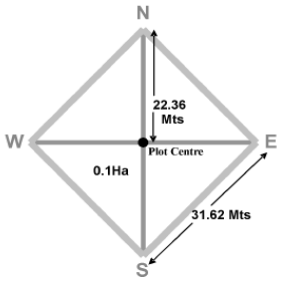


Fig 4.1.3.2: Sample plot layout.

3) After laying the sample plot, plots, the parameters evaluated is shown in table 4.1.3.2.a.

Table 4.1.3.2a: 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]

[13]National Working Plan Code –– For Sustainable Management of Forests & Biodiversity in India (2014), MoEFCC, 91p.
[14]FSI (2015) Carbon Stocks in India's Forest, 164p

4) For assessing mortality, every tree growing inside the plot were counted. Diameter for every tree growing inside the plot was measured 50 cm above the ground level for up to 3 years old plantation and 100 cm above ground level for up to 5 years plantations as mentioned in NEM CAMPA, 2016[15] using a tape.

5) For calculating the carbon content trees with girth above 30cm was taken to apply the allometric equations as developed by FSI[10] for calculating tree carbon. Accordingly, the carbon content per tree was calculated.

6) Data observed were recorded in Form B (Appendix I). Evaluated samples detail of plantation activities is shown in Annexure V.

(B) Other activities:

7) For evaluation of other activities, from a total of the activities under each component, 10% of activity were randomly selected. Activities that were physically visible like RCC pillars, beat office, quarters, etc. field evaluation on work status was conducted and geotagged pictures 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 4.1.3.2b.

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

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

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

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

4.3 Evaluation scoring

(A) Quantitative aspects

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

i) Plantation activities:

a) For raising of plantations, scoring of each samples were carried out in 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 in 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.

b) For nursery activities, scoring was done in 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 FP activities the scoring was done in a scale of 0 to 150. Scoring to evaluate works was based on the deviations observed in between the records and in the field. For deviations less than 10% = 150 points, 11% to 20% = 120 points, 21% to 30%= 90 points, 31% to 40% = 60 points, 41% to 50% = 30 points and for deviations above 50% = 0 points was given.

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

c) For the activities under FFM and CB the scoring was done in a scale of 0 to 50. Scoring to evaluated works was based on the deviations observed in between the records and in the field. For deviations less than 10% = 50 points, 11% to 20% = 40 points, 21% to 30%= 30 points, 31% to 40% = 20 points, 41% to 50% = 10 points and for deviations above 50% = 0 points was given.

d) For the activities under R&D, the scoring was done in a scale of 0 to 20. Scoring to evaluate works was based on the deviations observed in between the records and in the field. For deviations less than 10% = 20 points, 11% to 20% = 16 points, 21% to 30%= 12 points, 31% to 40% = 8 points, 41% to 50% = 4 points and for deviations above 50% = 0 points was given.

e) Other activities under ICT 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 availability of treatment plan on measurement books/ plantation journals.

c) Improvement in the quality of wildlife habitat are based on the impact of different plantations raised under CAMPA.

d) CAMPA benefits was based on 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 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 sheet[16].

Quantitative Aspects (A)				Qualitative Aspects (B)			
S. No.	**Main heading**	**Score**	**Total**	**S. No.**	**Main heading**	**Score**	**Total**
I.	Plantation activities (CA and NPV)		500	I.	Impact of awareness generation campaign		5
II	Other activities (CA & NFM)		100	II.	Identification of approved site for plantation		5
II.	Forest Protection		150	III.	Improvement in quality of wildlife habitat		5
III.	Forest Fire Management		50	IV.	CAMPA benefits (SC/ST/BPL households)		10
IV	Biodiversity Conservation		100	V.	Project Awareness		5
V	Research & Development		20	VI.	Transparency, maintenance and payments		5
VI	Capacity Building		50	VII.	Maintenance of assets created		10
VII	ICT		10				
VIII	IDM		100				
IX	Office Support		10				
Total (A)			**1090**	**Total (B)**			**45**
Grand Total (A+B)							**1135**

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 used to rank the performance[17]

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

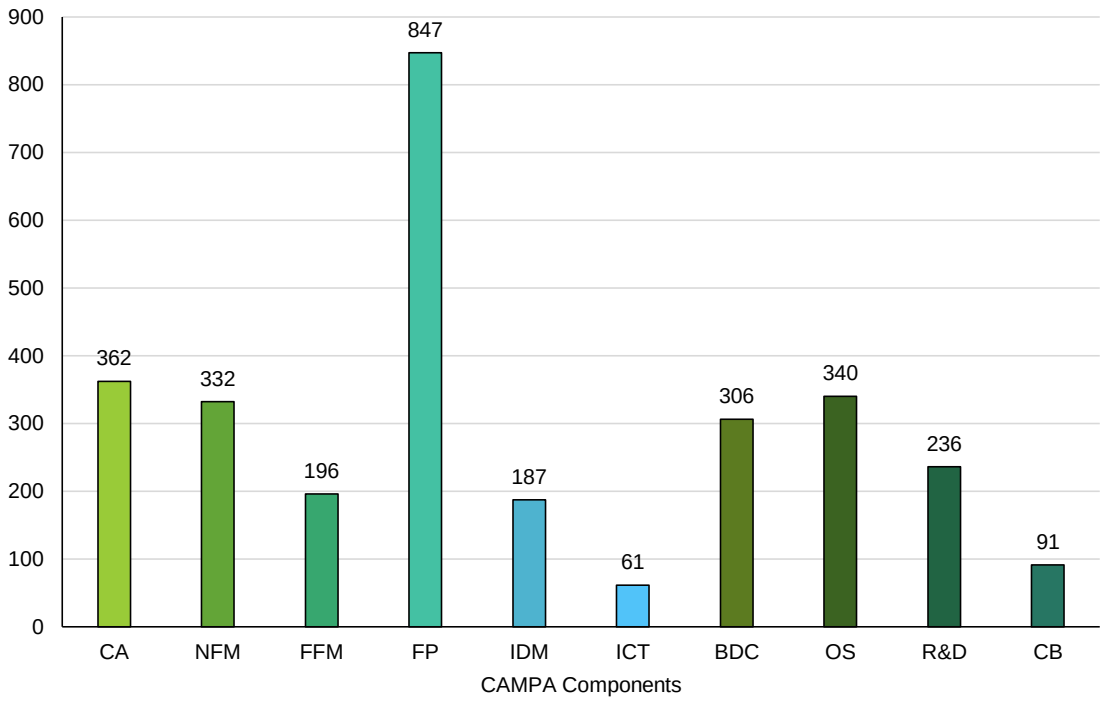
[17] National Evaluation Manual for CAMPA Projects (2016) CEAMT, IIFM Bhopal, 25 pages

Chapter 5

DATA ANALYSIS

The total number of activities undertaken by TSFD under different CAMPA components during 2010-2011 is shown in Figure 5.0.

Fig 5.0: Total number of works under different TSFD CAMPA components year 2010-11



A total of 2979 works were undertaken in the state of Telangana during 2010-2011 under different CAMPA components. Highest number of works were undertaken under FP followed by CA, OS, NFM, R&D, FFM, IDM, CB and ICT. Division wise details of total works are shown in table 5.0.

CA was undertaken by 18 divisions. The highest number of CA works was undertaken by Paloncha division. NFM activities were undertaken in 21 divisions, Mancherial undertook the highest number of NFM activities. FP works were carried out in 29 divisions of the state, among which Nizamabad had undertaken a maximum number of forest protection works. BDC works were undertaken by 21 divisions with Curator National Park undertaking maximum number of BDC activities.

Table 5.0: Division wise total number of works under different components of CAMPA for the year 2010-2011 ***(division list as per before bifurcation).***

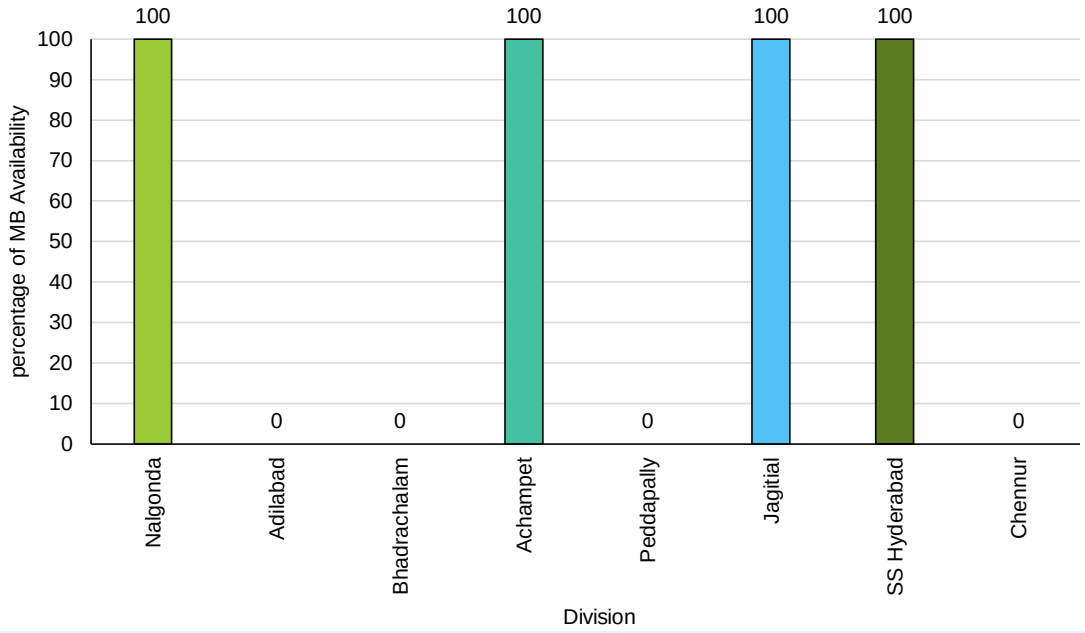
Division	CA	NFM	FFM	FP	IDM	ICT	BDC	OS	R&D	CB	Total Works
Achampet	89	2	13	75	1	-	28	10	-	-	**218**
Adilabad	13	21		42	13	1	-	15	-	-	**105**
APFA Dullapally	-	-	-	-	-	-	-	-	-	91	**91**
Bellampally	4	36	13	38	18	1	-	1	-	-	**111**
Bhadrachalam (Logging)	12	-	-	-	-	-	-		-	-	**12**
Bhadrachalam (North)	24	-	3	24	3	-	-	54	-	-	**108**
Bhadrachalam (South)	15	10	7	53	12	-	7	5	-	-	**109**
CNP	-	-	1	3	-	-	65	8	-	-	**77**
FG Warangal	-	-	-	-	-	-	-	3	156	-	**159**
FSP Hyderabad	-	-	-	4	-	-	-	1	-	-	**5**
FUO, Hyderabad	-	-	-	-	-	-	-	5	-	-	**5**
Hyderabad	4	11	49	56	31	51	1	89	-	-	**292**
Jannaram WL	-	5	4	19	7	-	17	1	-	-	**53**
Kagaznagar	-	8	6	26	11	-	-	3	-	-	**54**
Kamareddy	6	6	12	25	7	-	36	28	-	-	**120**
Karimnagar (East)	4	14	5	27	7	1	-	5	-	-	**63**
Karimnagar (West)	-	16	4	33	6	2	8	6	-	-	**75**
Khammam	14	39	3	58	4	-	-	12	-	-	**130**
Kothagudem	5	9	5	20	5	-	-	10	-	-	**54**
Mahabubnagar	1	10	18	12	12	-	5	2	-	-	**60**
Mancherial	30	63	12	23	11	1	4	6	-	-	**150**
Medak	2	10	1	27	5	-	4	3	-	-	**52**
Medak WLM	-	-	4	7	4	-	38	3	-	-	**56**
Nalgonda	4	22	7	24	9	-	1	7	-	-	**74**
Nirmal	-	14	2	41	14	1	1	3	-	-	**76**
Nizamabad	12	13	12	76	3	-	15	15	-	-	**146**
NZP Hyderabad	-	-	-	-	-	-	3	-	-	-	**3**
Paloncha	123	7	-	24	4	-	-	25	-	-	**183**
SS Hyderabad	-	-	-	-	-	-	-	6	80	-	**86**
Warangal (North)	-	13	1	44	-	1	13	3	-	-	**75**
Warangal (South)	-	3	5	37	-	1	7	2	-	-	**55**
Warangal WLM	-	-	9	13	-	-	7	2	-	-	**31**
WLM Hyderabad	-	-	-	19	-	-	11	6	-	-	**36**
WLM Paloncha	-	-	-	19		-	35	1	-	-	**55**
Total	**362**	**332**	**196**	**869**	**187**	**60**	**306**	**340**	**236**	**91**	**2979**

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 2010-2011 were digitized, collated and checked as per the audited records available at the O/o PCCF, TSFD, Aranya Bhavan. During 2010-11 only CA and R&D plantation were carried out in the divisions. 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.

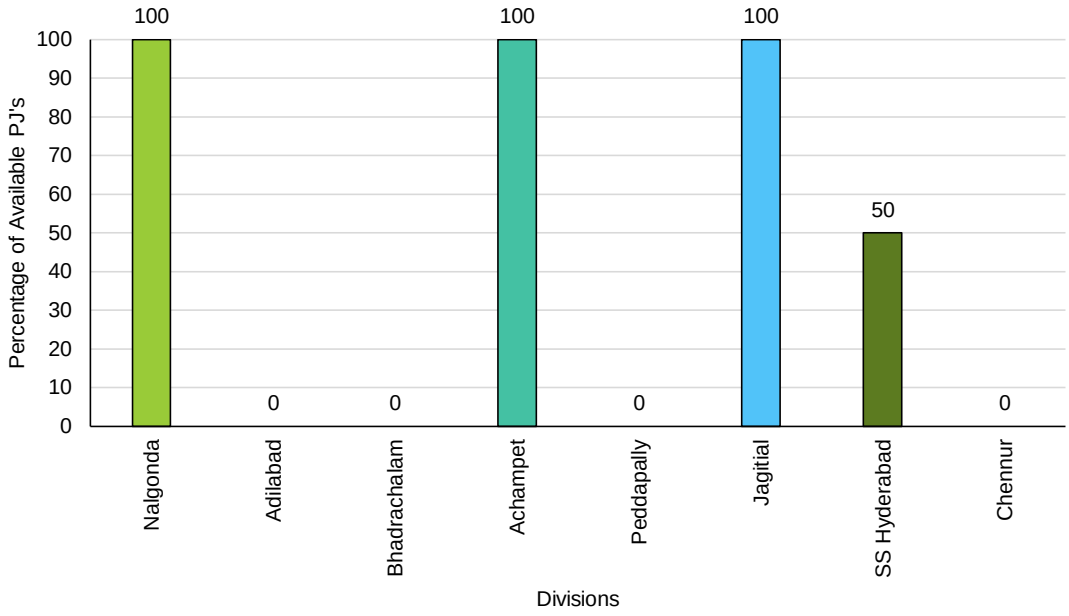
5.2.1 Measurement Books (MB): Section wise detail of works executed with estimates, amount disbursed, period of works, is mentioned in MB. It has been observed that out of 10 plantations, only for 6 plantations MBs were made available. Fig 5.2.1 shows the percent of MBs available during evaluation.

Fig 5.2.1:Division-wise details on percent of plantations 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 10 sample plantations, only 5 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.

Fig 5.2.2:Division-wise details on number of PJs available during evaluation.



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 Journal's (PJ) could be examined for fifty percent of the activities evaluated. Respective range level/ beat level officials during the evaluation time revealed that due to bifurcation of the Telangana state from erstwhile Andhra Pradesh and after further reconciliation of the divisions, documents have been kept at different places and therefore were unable to produce during evaluation. It indicates that less attention is given to PJs which otherwise is a very important document. Irrespective of the situation PJs should always be kept with care in the range where plantation has been carried out. Irrespective of any situation PJs should always be kept with care in the range office where plantation has been carried out.

Measurement Books (MB) could be examined for only 60% of the plantations evaluated. Lack of MB for the remaining 40% of plantations indicates that less attention is given on MBs which is one of the most important documents for any plantation activity. Further in all the available MBs Grid wise details on volume of works undertaken is lacking. Lack of grid wise details makes it very difficult to evaluate. All the MBs that were available had the signature of RFOs and other sub-ordinate officials indicating that RFOs have checked the works before making payments. Treatment plan and grid wise details of plantations are available in the examined PJs. All the examined PJs

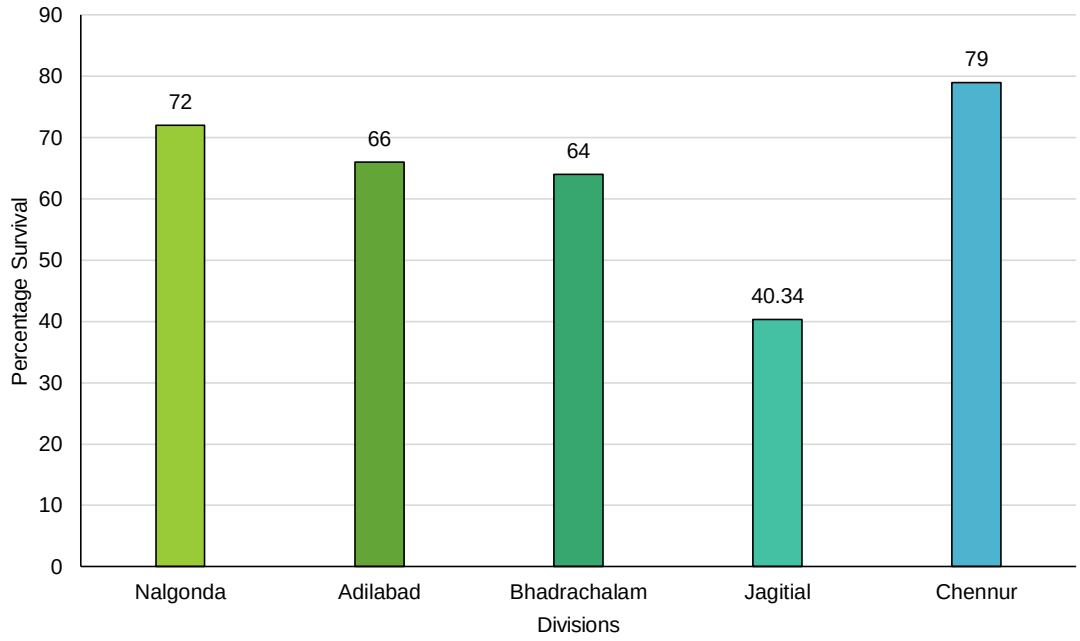
had the signature of RFOs indicating that proper methods have been adopted for conducting plantations.

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

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

5.3.1 Division wise plantation survival percentages: Division wise survival percentage of Eucalyptus and R&D plantations is shown in fig 5.3.1a to Fig 5.3.1b respectively.

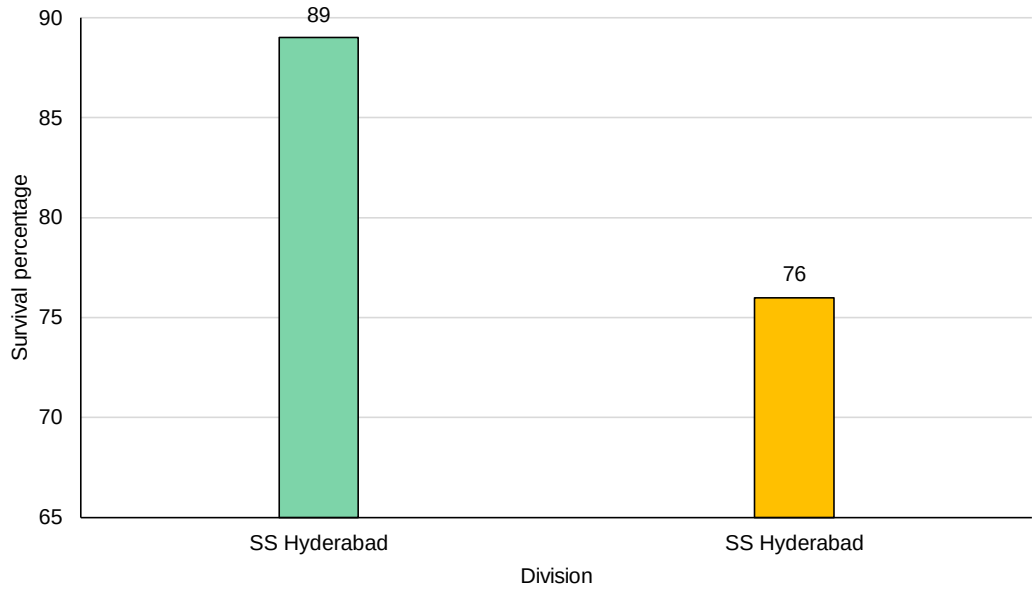
Fig 5.3.1a:Division-wise survival percentage of Eucalyptus plantations.



Average survival percentage of Eucalyptus raised under TSFD CAMPA across the divisions ranged from 40 % to 79 % based on the sampled data. Comparison of survival of plantations across the divisions (*see Fig 5.3.1a*) revealed that Chennur had the highest survival percentage of

Eucalyptus followed by Nalgonda and Adilabad. Jagtial reported the lowest survival percentage of Eucalyptus

Fig 5.3.1b:Division-wise survival percentage of R&D plantations.

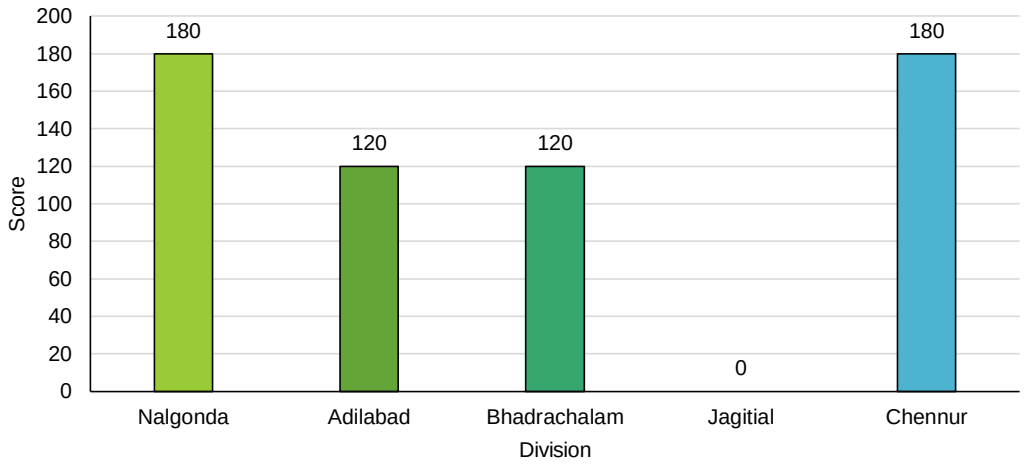


Average survival percentage of R&D plantations raised under TSFD CAMPA across the divisions is 82.5% as based on the sampled data. The graph representing survival percentage in SS Hyderabad in two sampled locations is mentioned in *Fig 5.3.1b.*

Findings: The plantations under TSFD CAMPA during 20010-2011 were raised under four different plantations types namely, Eucalyptus plantation and R&D. During 2010-11 no NFM plantations were raised by TSFD. Not a single total failure of Eucalyptus plantations raised during 2010-2011 under TSFD CAMPA was recorded during the evaluation. The R&D plantations raised during 2010-11 were evaluated in SS Hyderabad. The average survival percentage of the R&D plantations was 82.5 which fared better than the average of the Eucalyptus plantations grown during 2010-11.

Eucalyptus species, a high light demander is characterized by its ability to voraciously absorb water and nutrients to support its fast growth. This introduced species exhibited well in the areas planted, except in Jagtial, where its survival percentage is under 50% (*see Fig.5.3.1c*) Although there were signs of biotic interferences such as cut marks, loping, in almost all the plantation, Eucalyptus plantations sampled exhibited very high biotic interferences. In plantations of Bhadrachalam Mahaveera growth and fire incidents were observed.

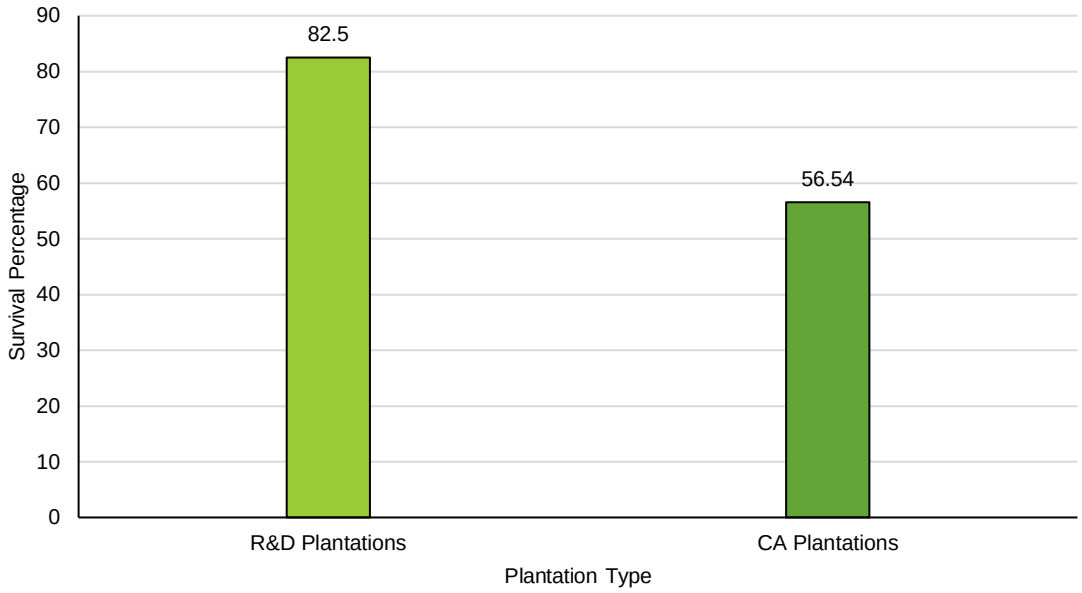
Fig 5.3.1c Division wise scores of Eucalyptus plantations raised under CAMPA during 2010-11



Eucalyptus spp. as revealed by the local people is not preferred as firewood especially for cooking due to the presence of an aroma. This characteristic perhaps further helped this species to establish in the state. On the other hand, during evaluation, not a single nest of birds was recorded in the eucalyptus plantations reflecting that this plantation type is not preferred as a nesting habitat for birds. Only wild boar, peacocks and few common snakes were found moving in and out of the Eucalyptus plantations.

5.3.2 Survival percentage of plantations under different CAMPA components: Plantations were raised under two CAMPA components namely CA and R&D in the state of Telangana during 2010-2011. 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 R&D exhibited the highest survival percentage (82.5%) followed by plantations raised under CA (56.54%).

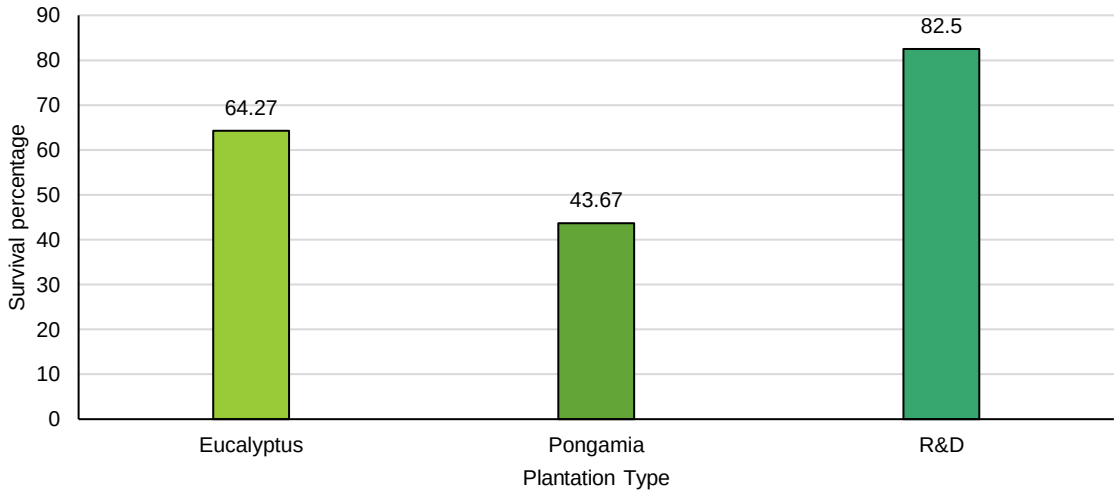
Fig 5.3.2: Average survival percentage of plantation under CAMPA components.



Findings: Analysis of field evaluation revealed that plantations raised under R&D performed better than those raised under CA during 2010-11 based on the sampled plot data. **Scores obtained by plantation raised under different CAMPA components namely CA, and R&D are 112.5, and 210, respectively based on the sampled plot data analysis**.

5.3.3 Survival percentage of plantations under different plantation type: Survival percentage of under different plantation types raised by TSFD CAMPA during 2010-2011 is shown in figure 5.3.3. The plantation can be categorized into *Eucalyptus*, *Pongamia* and R&D plantations for comparison.

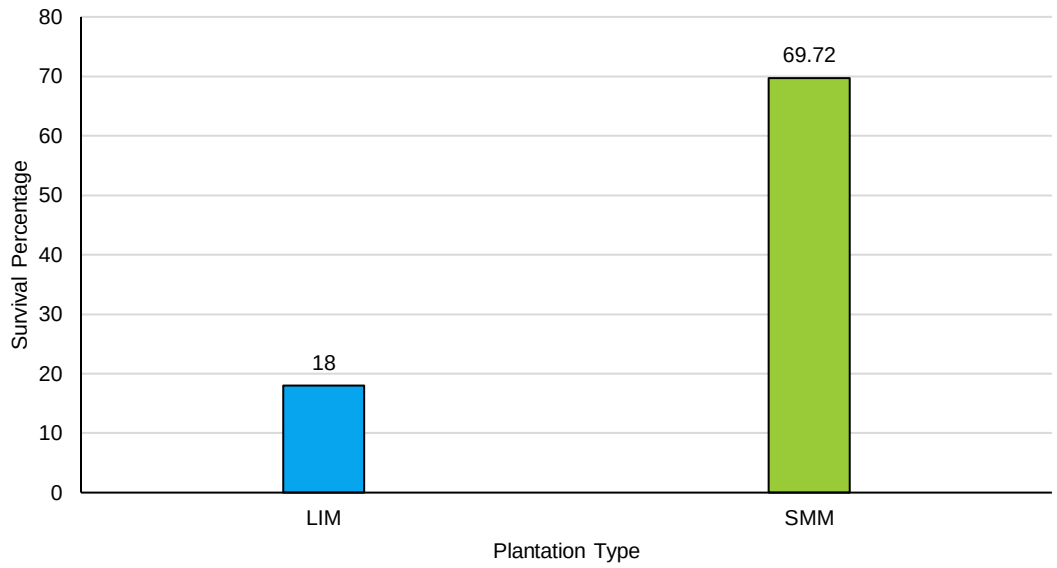
Fig 5.3.3: Average survival % of different plantation type under CAMPA during 2010-11



Findings: The analysis of the collected data reveals that the R&D plantation survival percentage (82.5) was the best followed by Eucalyptus and *Pongamia* plantations which were 64.27 and 43.67 respectively. Plantations raised under research plots scored 210. The primary species raised under R&D plantations are *Dalbergia latifolia*, *Madhuca indica*, *Choclospermum religiosum*, *Stereospermum suavelons* and *Hymnodictyon excelsa.* Among these species, survival percentage of *D. latifolia* was highest (89%).

5.3.4 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 2010-2011. Graphical representation of the results of plantations under the different planting methods is shown in Fig 5.3.4a. Survival of plantations was significantly higher (69.72%) under SMM method. Average survival percentage of plantations raised under LIM was found to be 18 percent.

Fig 5.3.4a: Survival percentage of plantation under LIM & SMM in 2010-11



Findings: Average survival percentage of SMM raised under TSFD CAMPA across the divisions ranged from 40 % to 95% based on the sample plot analysis. Comparison of SMM plantations survival across the division's reveals that SS Hyderabad had the highest survival percentage of SMM followed by Adilabad, Chennur, Nalgonda and Bhadrachalam. Jagtial divisions reported the lowest survival of SMM plantations raised under TSFA CAMPA during 2010-2011.

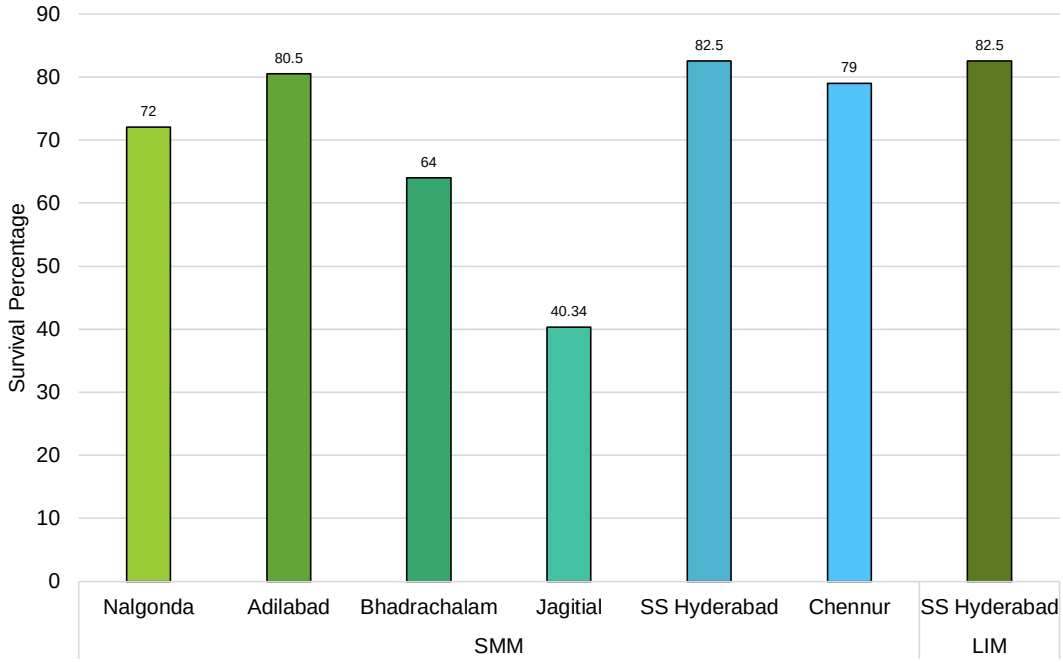
LIM plantations sample was taken in 2 divisions under TSFD CAMPA during 2010-2011. Average survival percentage of the LIM plantations under TSFD CAMPA across the division's

samples came out to be a total failure (0%) to 36%. It was worth noticing that *Pongamia pinnata* plantation in Pedapally division was a total failure.

The average score of SMM plantation 165 followed by LIM plantations which scored 0 and was the lowest due to less than 50 % survival percentage. SMM plantations performance was best recorded in Adilabad. Information received during field visits revealed that heavy biotic pressure is one of the prime reason for less survival in the plantations raised by TSFD. **Comparison of the two different planting method revealed that plantations raised under SMM performed better than those plantations raised under LIM**.

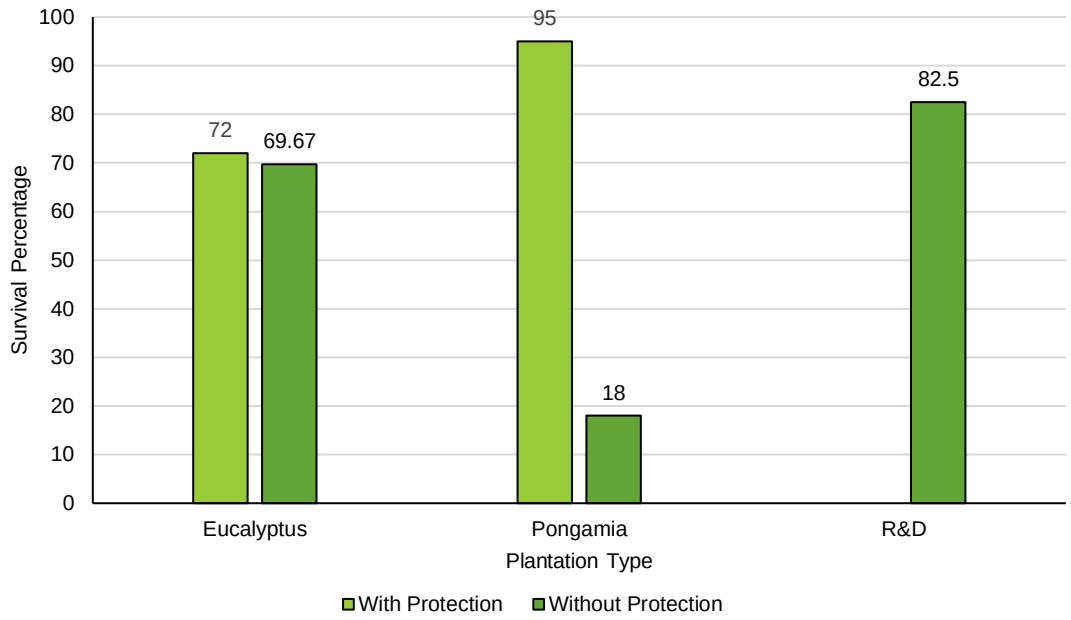
Division wise SMM and LIM plantation samples survival percentage is shown in Fig 5.3.4.

Fig 5.3.4b:Division-wise survival percentage of SMM plantation in 2010-2011



5.3.5 Survival percentage of plantations with protection and without protection: Comparison survival of different plantation types with protection and without protection. It is shown in Fig 5.2.5. It reveals that survival of Eucalyptus plantations was more (72%) under protection and lower (69.67%) in areas without protection. Survival of plants raised under Pongamia plantations were considerably higher in areas without protection. Plantations under R&D were raised without protection, though the survival percent recorded was as high as 82.5%.

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

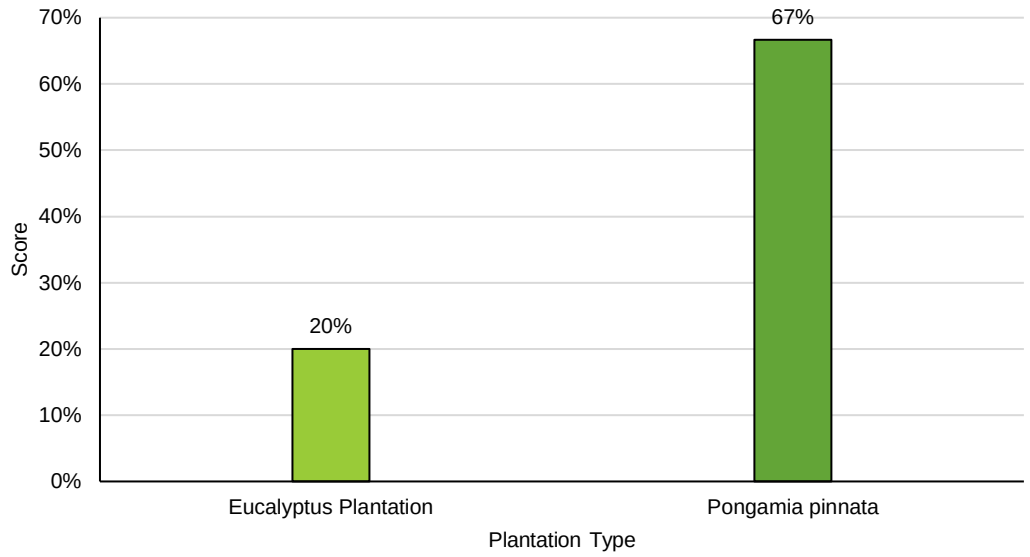


Findings: Under protection, plantation survival was more only in Eucalyptus and Pongamia plantations. However, biotic and grazing pressure was observed in almost all of the plantations irrespective of the protection measures taken.

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

Presence of wildlife was recorded in hundred percent of NTSH plantations raised under TSFD, CAMPA, followed by teak plantations. Presence of wildlife was recorded in 67 % of the *Pongamia pinnata* plantations. Presence of wildlife was observed only in 5 % of the sites under Eucalyptus plantations.

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



Findings: Presence of wildlife was recorded in *Pongamia pinnata* and Eucalyptus plantations raised under TSFD, CAMPA. In Pongamia pinnata plantation in Achampet with a very low survival percentage of 36 % was supporting wildlife due to its vicinity to natural forests. It reflects that although the survival percentage of *Pongamia pinnata* plantations are lower in comparison to that of Eucalyptus plantation yet wildlife species prefers *Pongamia pinnata* plantations as their habitat.

5.5 Growth of trees: Comparison of average height and average girth of different tree species raised under TSFD CAMPA during 2010-2011 is shown in Figure 5.5. Eucalyptus plantations exhibited fast growth, in terms of height and girth in comparison to other species planted under TSFD CAMPA. Other species grown are relatively slow growing species. The growth indicators of *Pongamia pinnata* suggests that it was the slowest growing species in the sampled plots. *Madhuca indica* fared well in the research plot but was having less growth than Eucalyptus plantation. *Madhuca indica* was followed by *Dalbergia latifolia* in terms of growth in the research plots. Division wise details of growth of Eucalyptus, Pongamia and R&D plantations is shown in figure 5.5.1, 5.5.2 and 5.5.3, respectively.

Fig 5.5: Comparison of average height and girth of different species raised under TSFD CAMPA during 2010-2011.

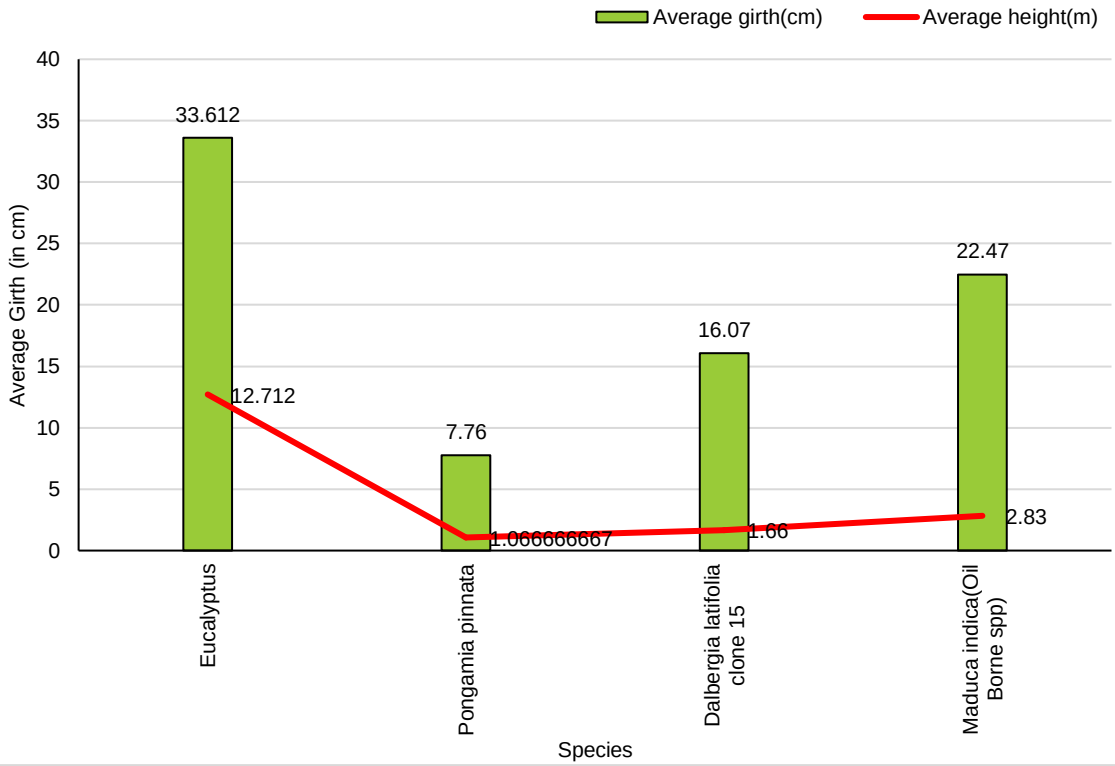


Fig 5.5.1: Division wise details for girth and height for Eucalyptus plantation 2010-11

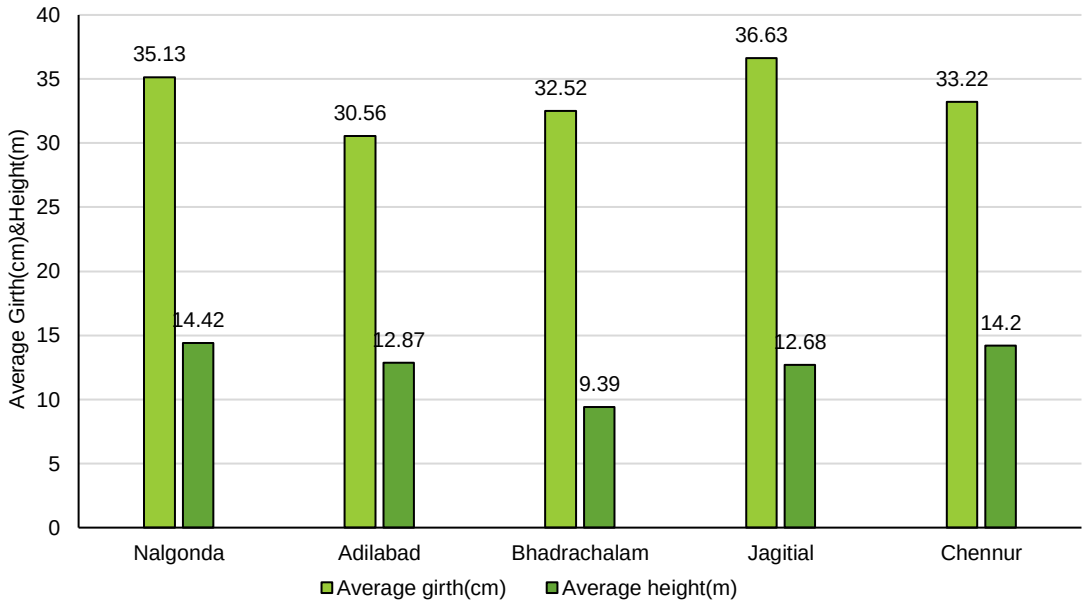


Fig. 5.5.2: Division wise details for girth and height parameters for Pongamia plantation 2010-11

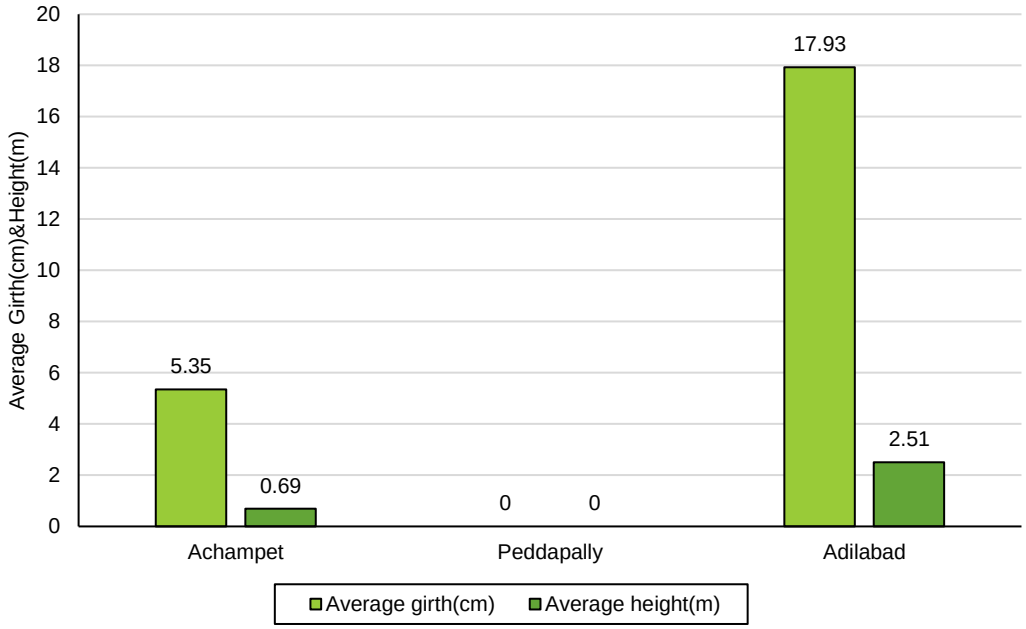
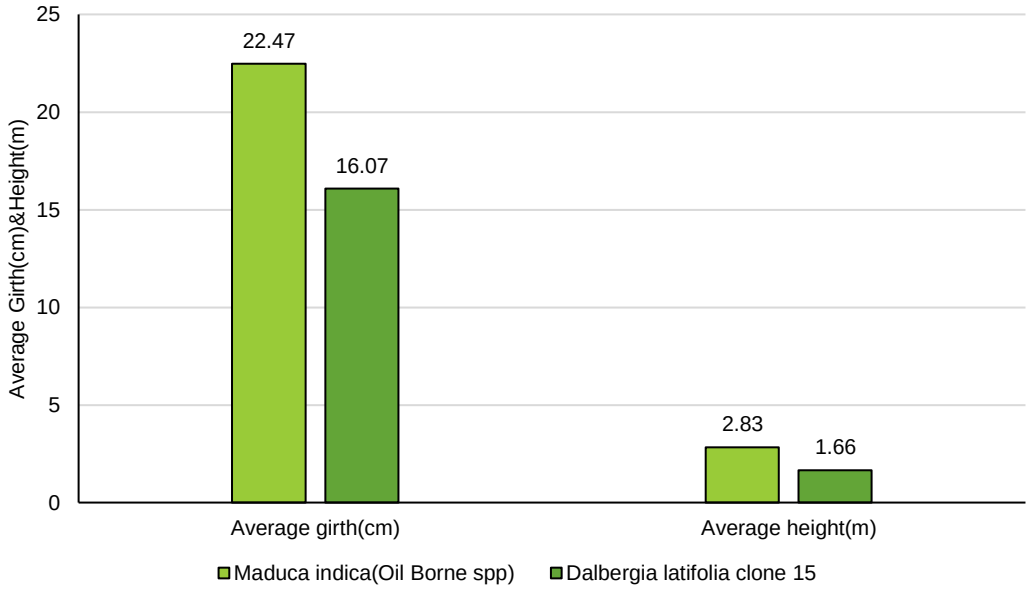


Fig 5..5.3: Details for girth and height parameters for R&D plantation species for SS Hyderabad division during 2010-11

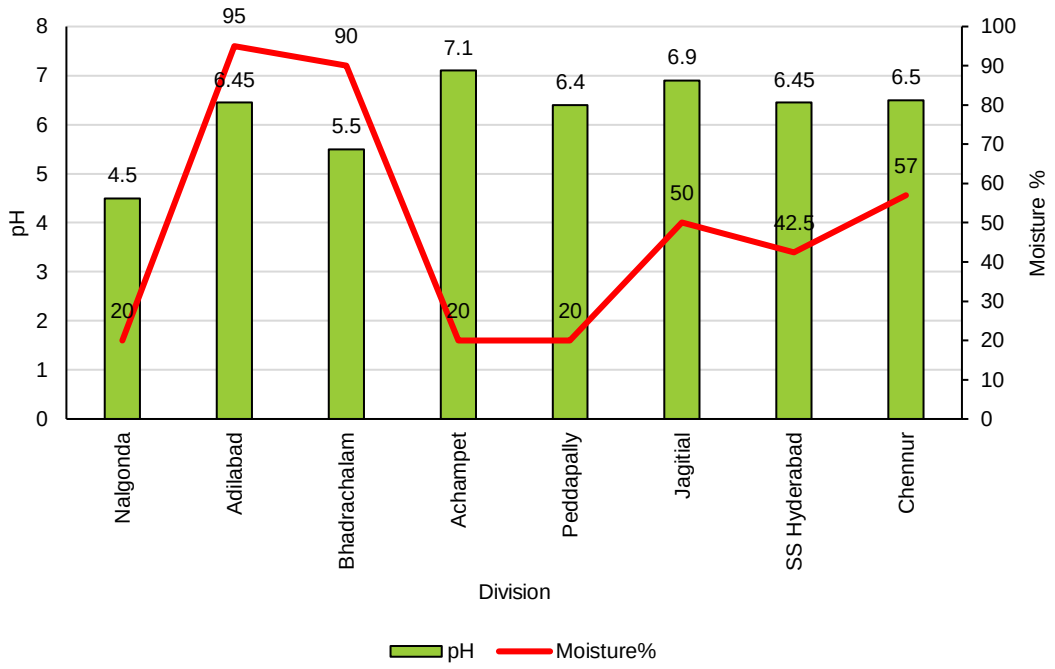


Findings: Eucalyptus plantations exhibited fast growth, in terms of height and girth in comparison to other species planted under TSFD CAMPA. The average girth of the Eucalyptus plantation carried out during 2010-11 has crossed 30 cm in all the divisions. In case of *Pongamia pinnata* the

average girth and height attained is too low. The R&D species *Dalbergia latifolia* and *Madhuca indica* had fair rate of growth.

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 Nalgonda to saline to 7.1 at Achampet. Percent soil moisture content varied widely across the divisions. It varied from 20% to 92%.

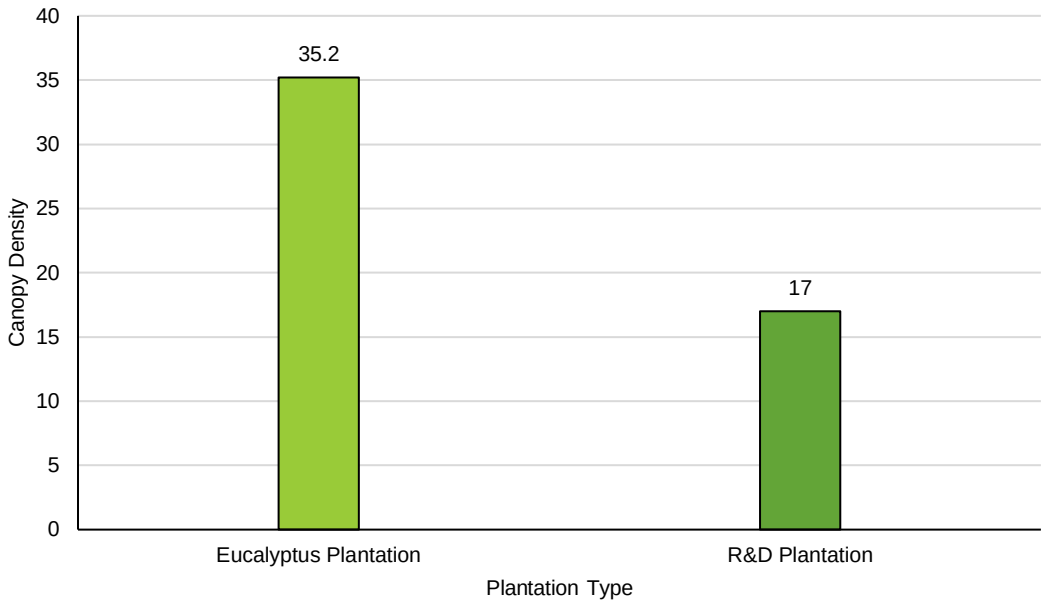
Fig 5.6: Soil pH and moisture content in the plantation sites.



Findings: Soil pH and soil moisture content are vital factors for plantations. Soil pH ranged from very acidic 4.5 to saline 7.1 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 20% to 95%. Higher soil moisture content was perhaps due to the rains during evaluation period. Crumb of hard soil in many places inidicated that average soil moisture content is relative on a lower side not suitable for plantations without artificial irrigation or innovative methods adopted else where in such areas across the world.

5.7 Canopy density: Average canopy density (*shown in fig 5.7*) under different was found to be highest in Eucalyptus plantation followed by research plots. No canopy density was observed for the *Pongamia pinnata* plantations.

Fig: 5.7: Average canopy density under different plantation types



Findings: Average canopy density was found to be highest in Eucalyptus plantation due to its attainment of faster growth. Average canopy density of R&D plantations were found to be 17.

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. Average per hectare forest carbon varied from 0.29 tonnes per hectare to 0.52 tonnes per hectare. Jagtial division exhibited highest forest carbon i.e. 0.52 tonnes per hectare followed by Chennur (0.49 tonnes per hectare). Lowest average forest carbon per hectare in plantations raised under TSFD CAMPA during 2010-2011 was observed in Adilabad (0.29 tonnes per hectare).

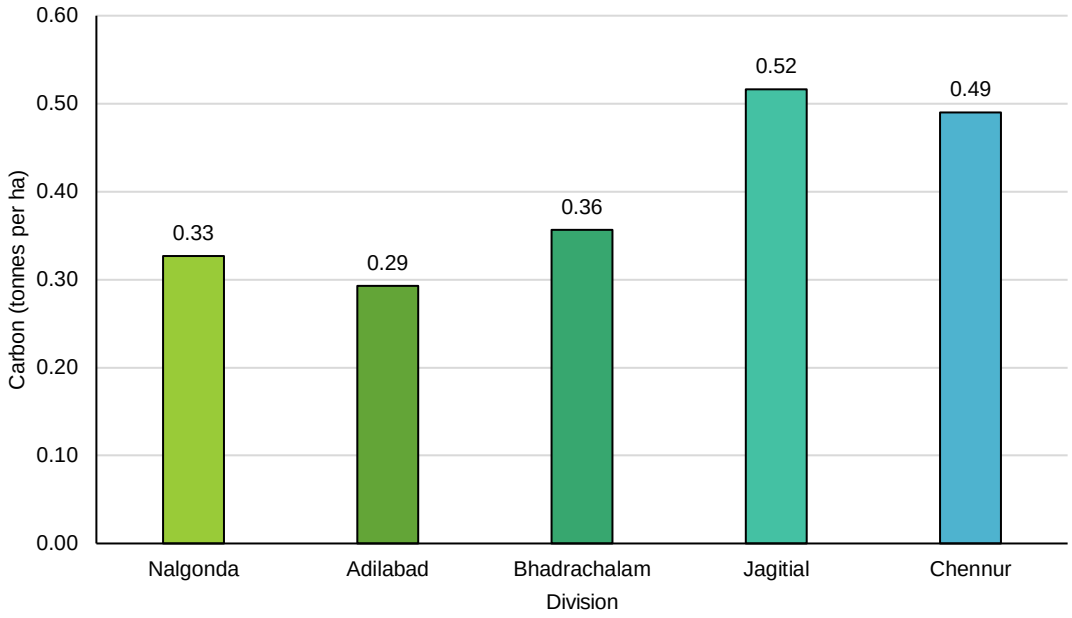
South Deccan

S.No.	Species Name	Volume Equation
1	*Acacia auriculiformis*	$\sqrt{V} = -0.00142 + 2.61911\ D - 0.54703\ ^{n}D$
2	*Albizzia amara*	$\sqrt{V} = -0.07109 + 2.99732\ D - 0.26953\ ^{n}D$
3	*Anogeissus latifolia*	$V = 0.289 - 2.653\ D + 11.771\ D^2$
4	**Butea monosperma(Old) Butea frondosa*	$V = 0.088183 - 1.490948\ D + 8.984266\ D^2$
5	*Chloroxylon swietenia*	$V = -0.0532\ D + 3.2378\ D^2$
6	*Dalbergia paniculata*	$V = 0.18945 - 2.46215\ D + 10.54462\ D^2$
7	*Eucalyptus species*	$V = 0.02894 - 0.89284\ D + 8.72416\ D^2$
8	*Hardwickia binata*	$V = 0.063632 + 5.355486\ D^3$
9	*Lagerstroemia parviflora*	$V = 0.066188 - 1.334512\ D + 9.403257\ D^2$
10	*Lannea coromandelica/lannea grandis/odina wodier*	$V = 0.091153 - 1.66153\ D + 10.24624\ D^2$
11	**Syzygium cumini/jambolanum (Old) Eugenia jambolana*	$V = 0.088183 - 1.490948\ D + 8.984266\ D^2$
12	*Tectona grandis*	$V = -0.2414 + 2.8458\ D - 5.5816\ D^2 + 14.816\ D^3$
13	*Terminalia crenulata/tomentosa*	$V = 0.051812 - 1.076790\ D + 7.991280\ D^2$
14	*Terminalia paniculata*	$V = 0.13100 - 1.87132\ D + 9.47861\ D^2$
15	*Wrightia tinctoria*	$\sqrt{V} = 0.050294 + 3.115497\ D - 0.687813\ \sqrt{D}$

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

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

Fig 5.8: Division wise Carbon content of Eucalyptus plantation in 2010-2011



Findings: The average per hectare carbon under Eucalyptus plantation raised under TSFD CAMPA during 2010 – 2011 is 0.40 tonnes per hectare. Jagtial division exhibited highest forest carbon i.e. 0.52 tonnes per hectare followed by Chennur (0.49 tonnes per hectare). The Pongamia pinnata plantation were not able to achieve any canopy cover.

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 2010-2011 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 deviation with that of field and any other critical issues on the CAMPA activities for the state of Telangana.

5.9.1 Other activities under CA and NFM: A total of different forest protection activities (FP) were undertaken by TSFD CAMPA during 2010-2011. Twenty eight samples were evaluated under CA and NFM other activities. Sample evaluation details is provided in Annexure V. Average score based on the percent variation obtained by each CA/NFM other activities is shown in Figure 5.9.2. **The total score obtained by CA and NFM other activities is 85.625 out of 100**. The performance of the implementation was good, however at several instances documents provided were not enough to evaluate the activities in a proper way.

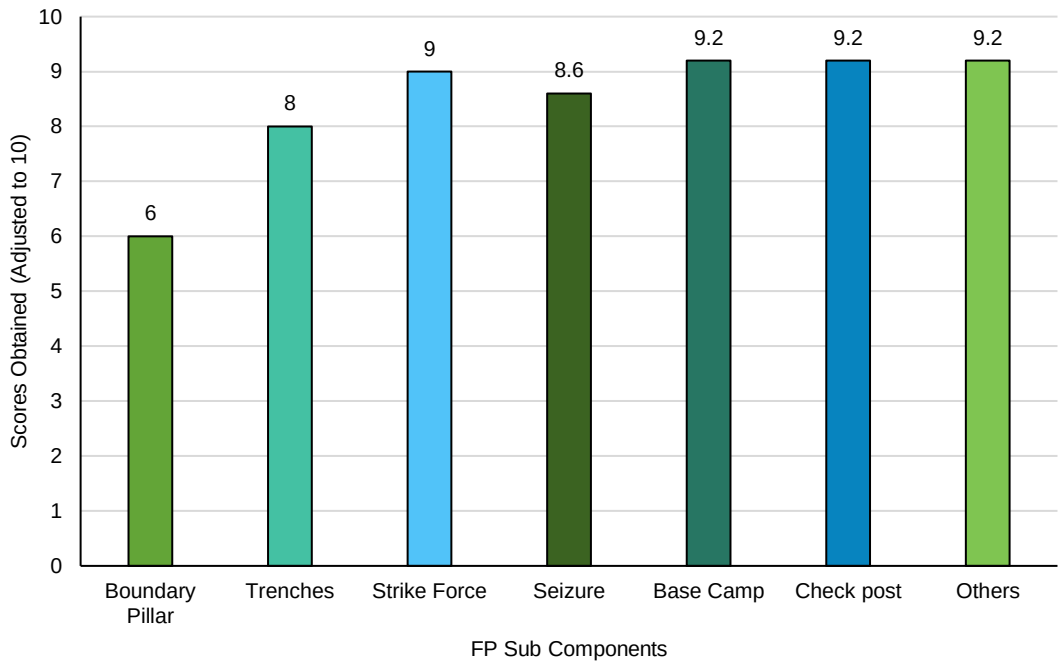
5.9.2 Forest Protection: A total of 869 different forest protection activities (FP) were undertaken by TSFD CAMPA during 2010-2011. 88 samples were evaluated under ten sub-components of FP (*table 5.9.2*). Sample evaluation details is provided in Annexure V. Average score based on the

percent variation obtained by each FP sub-component is shown in Figure 5.9.2. **The total score obtained by forest protection is 132.69 out of 150**.

Table 5.9.2: Number of samples evaluated under different sub-components of FP.

No.	Forest Protection (FP) sub components	Number of samples
A	Boundary pillars	1
B	Trenches	1
C	Strike forces	8
D	Seizures	3
E	Base camps	10
F	Check posts	10
G	Other activities	54
Total		**88**

Fig 5.9.2: Summary score of evaluated samples under FP



Findings: Of the seven FP sub-components evaluated, variation of dimension was observed in activity under one sub-component i.e. peripheral trenches and boundary pillar. In Chennur, during field evaluation the boundary pillars were found to be damaged at several places. Strike force, Base Camp and Check post are being maintained at several places in and around the forest areas.

5.9.3 Forest Fire Management (FFM): A total of 196 forest fire management (FFM) works were undertaken by TSFD CAMPA during 2010-2011. Slightly more than 10% sample, i.e. 20 samples all falling under one sub-component namely fires watchers were evaluated. Scores obtained during field evaluation is provided in table. 5.9.3. Sample evaluation details is provided in Annexure V. Average score based on the percent variation obtained by each FFM sub-component is shown in Table 5.9.3. **The average score obtained by forest fire management is 43.50 out of 50**.

Table 5.9.3 Evaluation summary of FFM samples.

S. No.	Division	Range	Activity	Score
1	Medak	Medak	Wages to Fire Protection Watchers in Pocharam W.L.S.	40
2	Karimnagar	Karimnagar	Fire Watchers of Karimnagar Range	50
3	Warrangal WLM	Kothaguda	Engaging Firewatcher in Kothaguda 1 Range	40
4	Asifabad	Asifabad	Fire Tracking operation in Pegadapally VSS in Bellampally Range	50
5	Hyderabad	Mohammabad	Wages to 2 Firewatchers in RF lock Mohammabad	40
6	Warrangal South	Warrangal	Wages to Firewatcher in Warrangal	40
7	Jagtial	Jagtial	Wages to 3 Firewatchers in Jagtial Range	40
8	Bhupalpally	Azamnagar	Estimate for Fire Tracing along existing and new line in Azamnagar, Borlaguda and Kankanoor sections of Azamnagar for 2010-11.	50
9	Yadadri Bhuwangiri	Choutupal	Payment of fire watcher charges for protection of forest stock during Jan, Feb and March 2010	50
10	Sircilla	Sircilla	Fire Watchers, engaged in Sircilla Range	50
11	Mahbubabad	Mahbubabad	Wages to Fire Watchers	40
12	Warrangal South	Warrangal	Wages to Firewatcher in Warrangal	40
13	Vikarabad	Mohammabad	Wages to Firewatchers in Vikarabad	40
14	Nalgonda	Miryalaguda	Creation of firelines at Wazeerabad block	50
15	Kothagudem	Kothagudem	Wages to Firewatcher in Kamalapuram, Abbugudem	40
16	WLM Paloncha	Paloncha	Wages to firewatchers in WLM Paloncha	40
17	Bhadrachalam North	Dummugudem	Payment of Firewatcher for the months of 2/2011 and 3/2011	40
18	Bhadrachalam North	Charla	Payment of Firewatcher for the months of 2/2011 and 3/2011	40
19	N. Sagar WLM	Nagarjunasagar	Estimate to Wages to Fire Watchers period	50
20	Bhadrachalam North	Venkatapuram	Payment of Firewatcher for the months of 2/2011 and 3/2011	40

Findings: Highest FFM works were undertaken in Hyderabad followed by Mahabubnagar and Bellampally. Field evaluation of the fireline created during 2010-11 was tried in Nalgonda, however it is was difficult evaluate it. Creation of firelines, fire tracing operation and hiring of firewatchers were the main activities were allocated funds were spent under these component.

5.9.4 Biodiversity Conservation and Development (BDC): A total of 306 different biodiversity conservation and development activities (FP) were undertaken by TSFD CAMPA during 2010-2011. Thirty one samples were evaluated under six 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 5.9.4. **The total score obtained by forest protection is 86.40 out of 100**.

Fig 5.9.4: Summary score of evaluated samples under BDC

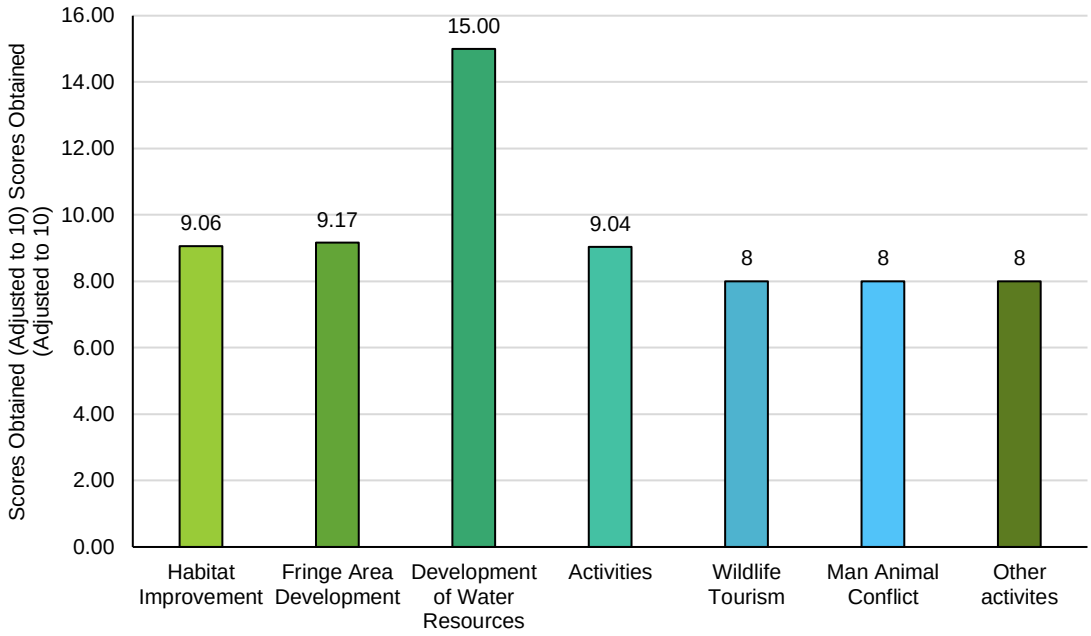


Table 5.9.4 Number of samples evaluated under different sub-components of BDC.

No.	BDC sub components	Samples
A	Habitat Improvement	13.59
B	Fringe Area Development	13.75
C	Development of Water sources	15
D	Wildlife tourism activities	8
E	WEE activities	14
F	Human and animal conflicts	11.25
G	Other BDC activities	11.25
Total		**86.40**

Findings: There were 311 works under BDC component undertaken. Highest activities were undertaken in in CNP, Hyderabad followed by WLM Paloncha. Of seven habitat improvement, activities under development of water resources scored full 15 out of 15 points. WEE activities scored 14 out of 15 points followed by Fringe area development and habitat improvement which scored 13.75 and 13.59 out of 15 respectively. Human and Animal conflicts and other BDC activities scored equal marks of 11.25 each out of 15. Wildlife Tourism Activities scored the lowest i.e. 8 out of 10 points.

5.9.5 Research & Development (R&D): The total number of different works under CAMPA NPV component research and development undertaken by TSFD CAMPA during 2010-2011 is 236. 10% of the total works, 24 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 5.9.5. **The average score obtained by Research and Development is 19.5 out of 20**.

Table 5.9.5: Summary of R&D sample evaluation.

S. N	Division	Range	Activity	SO. No	Lat	Long	Characteristics	Score
1	FG Warrangal	FG Warangal-2	Estimate for the 2nd year maintenance of Eucalyptus plantation (CMA) at JRC 2010-11	02/DIV/2010-11	18.1393	79.8656	Maintenance of research plot, weeding and soil work, research data collection and analysis and documentation	16
2	FG Warrangal	ARC, Achutapuram	Preparation of Vermicompost pit at ARC	16_DIV_2010-11	17.2040	80.9980	Earthwork, litter collection, shredding, mixing, plastering of surface and other activities	20
3	FG Warrangal	ARC, Achutapuram	Maintenance of Bore well (changing of HDP pipe) at ARC	17_ARC_2010-11	17.2040	80.9980	Changing of bore well pipe, purchase of Godavari pipes, SS stem plunger, lifting and dumping charges, electrical and transport charges	20
4	FG Warrangal	FG Warangal-1	Ex-situ raising of 20000 no. of tube/bag plants nursery in Warangal-I	1Wgl/2010-11	17.9903	79.5396	Pre-treatment of seeds, watering of beds, weeding of primary beds, cost of chemicals, Clearing RT tubes, Preparation of potting medium, filling of root trainers	20
5	FG Warrangal	ARC, Achutapuram	Revised estimate for development of demo plot and second year maintenance at ARC	23 DIV 2010-11	17.2040	80.9980	Maintenance of research plots, data capturing, analysis and documentation	20
6	FG Warrangal	ARC, Achutapuram	For Selection of CPTs of ARC	23_ARC_2010-11	-	-	Labour charges, boarding charges, and miscellaneous Charges	20
7	FG Warrangal	ARC, Achutapuram	Estimate for maintenance, capturing plot data and analysis of research plots at ARC	26_ARC_2010-11	17.2040	80.9980	Maintenance of research plots, data capturing, analysis and documentation	20
8	FG Warrangal	FG Warangal-1	Estimate for raising of 20000 no. tubets/bag plants nursery in Warangal-1 under CAMPA during 2010-11	27/Div/2010-11	17.990	79.5396	Raising of nursery bags under CAMPA 25% municipal allowance including labour component. The activities include treatment of seed, watering and weeding of primary beds, cost of chemical, clearing of RT, preparation of root mixture and filling of root trainers.	20
9	SS Hyderabad	FRC-Mulugu	Estimate for raising & maintenance 80000 no. of RT nursery at FRC Dulapally	30/2010-11/S2	17.7222	78.6275	Preparation of potting medium with organic compost charcoal granule partially burnt rice husk in 14:1:1 ratio, cost of conveyance of charcoal granules chemical fertilizers	20

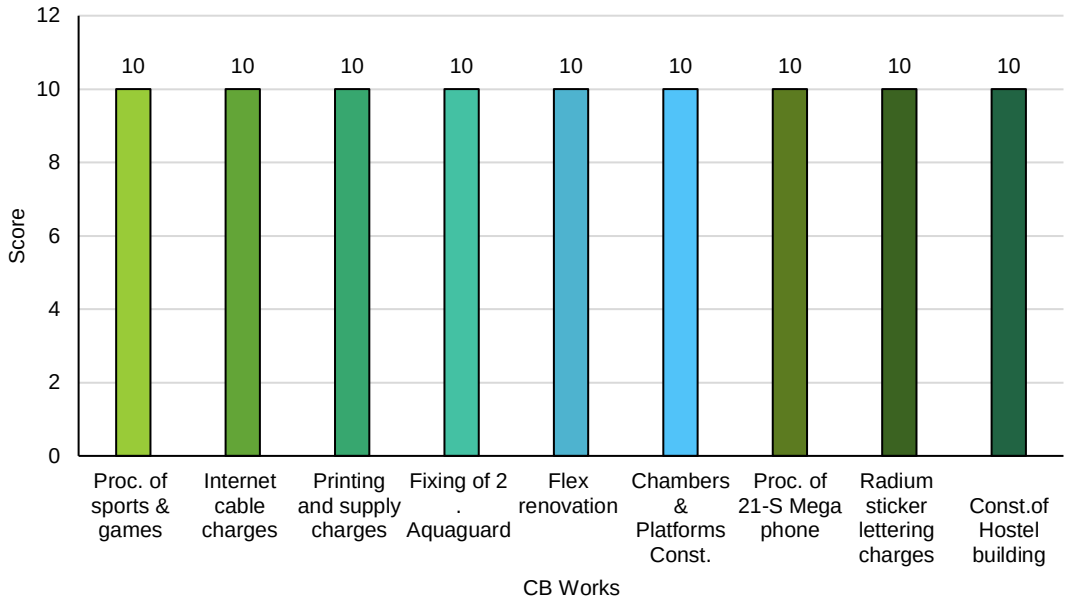
S. N	Division	Range	Activity	SO. No	Lat	Long	Characteristics	Score
							and insecticides. Filling of root trainer tubes with potting material	
10	FG Warrangal	FG Warangal-1	Ex-situ preparation of vermicompost	31Wgl/2010-11	17.9906	79.5394	The activities involve manual shredding, mixing of leafy material, cost of earthworm, drying of compost	20
11	FG Warrangal	FG Warangal-2	Selection CPTs in Adilabad circle of Dalbergia latifolia and *Pterocarpus marsupium* species	36/WGL-2/2010-11	-	-	Selection of Candidate Plus Trees,, labour for marking of trees and seed collection	20
12	FG Warrangal	FG Warangal-1	Estimate of Seed sale counter	37Div/2010-11	17.9897	79.5402	White wash of Seed Sale counter	20
13	SS Hyderabad	FRC-Mulugu	Estimate for extension of Arboretum at FRC Dulapally	38/2010-11/S2	17.543	78.4616	Uprootal of lantana and *Parthenium*, clearing and burning of thorny jungle growth, digging and removal of stumps, tree planting	20
14	FG Warrangal	FG Warangal-2	Preparation of Neem Kernel powder (1000kg) at JRC	40/wgl-2/2010-11	18.13745	79.8639	Cost of Neem seed, labour wages to powder the neem seeds, transportation charges	20
15	FG Warrangal	FG Warangal-1	Estimates for contingencies and Unforeseen expenditure	41/wgl1/2010-11	NA	NA	Multi-colour brochures printing charges	20
16	SS Hyderabad	FRC-Mulugu	Estimates for preparation of 50cm of compost at FRC Dullapally	43/2010-11/S2	17.54045	78.4610	Cost of raw material coconut husk, transportation including loading and unloading, sprinkling of water	20
17	FG Warrangal	ARC, Achutapuram	Estimate for production of Eucalyptus clones rooted cuttings at RC Achutapuram	45/DIV/2010-11	17.250247	81.0471	Estimate for production of 2 lakh Eucalyptus clone-7, the activity involves filling of coppice, application of copper solution, cleaning of 100/L RT, spraying of fungicide, shifting of root trainers, watering etc.	20
18	SS Hyderabad	FRC-Mulugu	Estimates for maintenance of old test plots CSO, Experimental plots, CMA plots	46/2010-11/S2	-	-	Deweeding and uprootal of plantation	20
19	FG Warrangal	ARC, Achutapuram	Purchase of Weed cutter	46_DIV_2010-11	17.204058	80.9980	Purchase of weed cutter and transport charges	16
20	FG Warrangal	FG Warangal-2	Engaging casual labour at JRC	5/Div/2010-11	18.1374	79.8639	Watch and ward for four months	16

S. N	Division	Range	Activity	SO. No	Lat	Long	Characteristics	Score
21	SS Hyderabad	FRC-Mulugu	Estimate for production of Eucalyptus clones rooted cuttings (50000 no's) at FRC Mulugu	67/2010-11/S2	-	-	Cleaning of 100 cc root trainers, harvesting and cutting of coppice, Spraying of fungicides	20
22	FG Warrangal	FG Warangal-2	Maintenance of DEMO plot *Oroxylum indicum* 2003 at JRC	9/Wgl-II/2010-11	18.1385	79.8648	Charges for weeding and soil working for four months from July to September, November and January 2010-11	20
23	FG Warrangal	FG Warangal-2	Advance operation for raising of plantation at JRC	77/div/2010-11	18.13920331	79.865735	Clearing of miscellaneous growth, uprootal of stumps	20
24	FG Warrangal	MRC	Collection of Teak seed	40/Div/2010-11	-	-	Collection of seed to supply for the plantations raising the charges of seed collection and transportation	20

Findings: FG Warangal having four centers across the state and SS Hyderabad undertook 236 R&D activities under TSFD CAMPA. However, during field evaluation plantations raised on R&D plots scored better than those raised under CA.

5.9.6 Capacity Building: CB activities were undertaken in Telangana State Forest Academy under CAMPA NPV component during the year 2010-2011. The total number of different works under CB component undertaken by TSFD CAMPA during 2010-2011 is 91. 10% of the total works, 9 samples of CB were evaluated. Details of evaluated samples is provided in Annexure V. Average score based on the percent variation evaluated on the basis of the available documents is shown in Fig 5.9.6. **The total score obtained by CB is 50 out of 50**.

Fig 5.9.6: 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. A hostel was constructed for the Forest Range Officers for residential training purposes.

5.9.7 Information Communication and Technology (ICT): The total number of different works under ICT component undertaken by TSFD CAMPA during 2010-2011 is 60. 10% of the total works, 6 samples of ICT were evaluated. Details of evaluated samples is provided in Annexure V. The ICT samples is shown in Table 5.9.7. The total score obtained by ICT is **9.67 out of 10.**

Table 5.9.7 Evaluation summary of ICT samples.

S. No.	Division	Range	Activity	SO. No	Score
1	Adilabad	Adilabad	Communication charges to Executive staff of Adilabad Range	DFO26/2010-11	10
2	Khanapur	Khanapur	Expenditure Incurred for Inventory of Trees Outside the Forests	33/KPR/2010-11	10
3	Yadadri Bhuvangiri	Choutupal	Payment of communication charges to staff in Choutupal Range during 2010-11	32 CAMPA NPV 2010-11	10
4	Paloncha	Bayyaram	Cellphone bill charges to Range staff of Bayyaram Range in Paloncha division	201 2010-11	8
5	Banswada	Gandhari	Estimate for Communication Charge to the Regular & Contract basis Range staff members of Gandhari Range during 2010-11	R/10/CAMPA/2010-11	10
6	N. Sagar WLM	N. Sagar	Estimate for Communication Charges of Staff of WLM Range Nagarjunasagar Period from 04/2010 to 03/2011 (12 Months)	RSO.4/2010-11	10

Findings: There were a total of 61 activities undertaken in 2010-2011. The maximum number of ICT work was carried out in Hyderabad followed by Karimnagar. ICT activities were procurement

of GPS (Garmin 72 H), desktop purchase, laptop purchase, repair works, communication charges to staff, evaluated based on the available records indicated highly satisfactory performance.

5.9.8 Office Support (OS): The total number of different works under OS component undertaken by TSFD CAMPA during 2010-2011 is 340. 10% of the total works i.e. 340 sample namely. Expenses towards office support was maximum for Hyderabad followed by Bhadrachalam. Details of the evaluated sample is provided in Annexure V. **Total score based on the percent variation of the OS activity evaluated on the basis of the available documents is 8.88 out of 10**.

Table 5.9.8 Evaluation summary of OS samples.

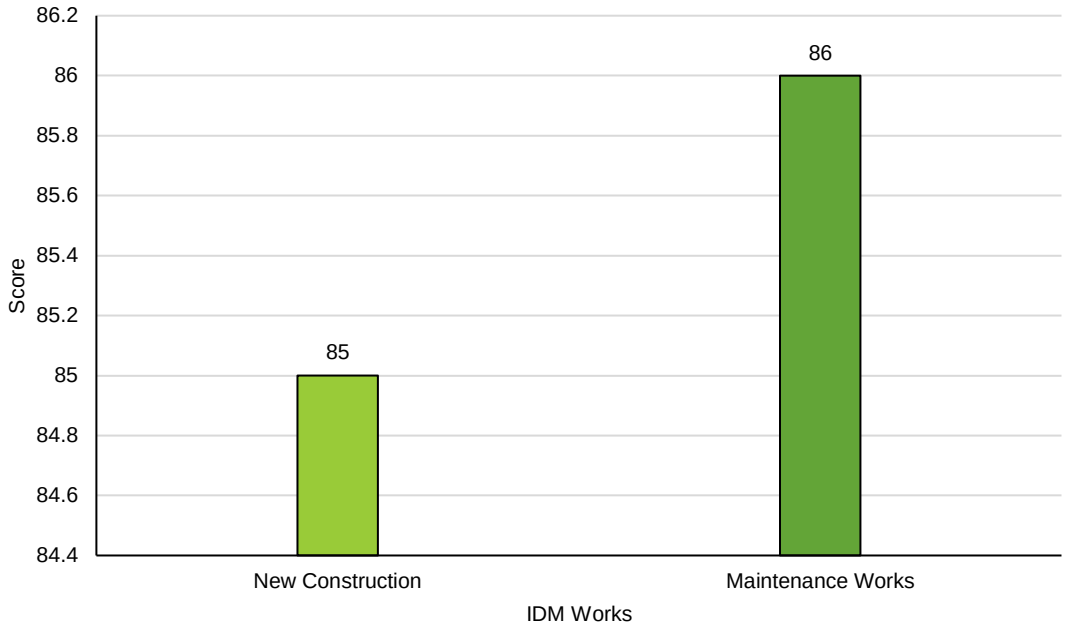
S. No.	Division	Range	Activity	SO. No	Score
1	Khammam	Khammam	Payment to Gupta cyber technologies for office expenses	100/2010-11	8
2	Karimnagar	Karimnagar	Selection & Recruitment of FSOs, FBO.s & ABOs in the year 2010-2011	13/ACF/2010-11	10
3	Warangal (Rural)	Narsampet	Office support of Division office	14-2010-11	10
4	Jannaram	Jannaram	Communication charges to the frontline staff of WLM Division, Jannaram	16/CAMPA/2010-11/S5,	10
5	Yadadri Bhuvangiri	Choutupal	OFFICE EXPENSES IN CHOUTUPPAL RANGE DURING 2010-11	2 CA ORR II 2010-11	10
6	Karimnagar	Karimnagar	Telephone & Stationery charges Division office, Karimnagar	21/K/2010-11	10
7	Adilabad	Adilabad	Remuneration charges to CA for auditing CAMPA for the year 2009-10	23_2010-11	8
8	Kothagudem	Kothagudem	Purchase of Almyra and stationery articles etc.	29 2010-11	8
9	Echoda	Boath	Communication charges to Executive staff of Echoda Range	29_2010-11	10
10	Khammam	Karepally	Estimate of payment of electricity bill of FRO Karepally forest guest house Karepally	51/2010-11	8
11	Asifabad	Asifabad	Communication charges (Cell phone charges) at Executive staff at Asifabad Range	55/2010-11	10
12	Jannaram	Jannaram	Telephone & communication charges and Office Stationary in WLM Jannaram	73/2010-11/S5	8
13	Bellampally	Bellampally	Office support in Bellampally Division	DSO 61 2010-11	8
14	Bhadrachalam	Bhadrachalam	Payment to telephone charges in Division	SO 48 2010-11	8
15	Adilabad	Adilabad	Subscription to Indian Forester for the year 2008 of O/o CFAC, Adilabad	DFO/13	8
16	Karimnagar	Karimnagar	Remuneration charges to DEO from Division Office	2470 2010-11	8
17	Paloncha	Paloncha	Cheque book charges	276 2010-11	8
18	Adilabad	Adilabad	Softy purified drinking water of O/o CFAC, Adilabad	DFO/16	8
19	SS Hyderabad	SS Hyderabad	Purchase of Misc. items under CAMPA	39 2010-11	8
20	WLM Hyderabad	WLM Hyderabad	Engaging of DEO at O/o CCF Hyderabad	6 2010-11	8
21	Adilabad	Adilabad	Softy purified drinking water of O/o DFO, Adilabad	DFO/33	8
22	Adilabad	Adilabad	Purchase of Hardware and Misc. Items in O/o CFAC, Adilabad	DFO/39	8
23	Adilabad	Adilabad	Purchase of Stationary items in O/o CFAC, Adilabad	DFO/40	8
24	Adilabad	Adilabad	Rents, Rates and Taxes charges	DFO/5	8
25	Adilabad	Adilabad	Electricity charges	DFO/6	8
26	Utnoor	Utnoor	Communication charges to Executive staff of Utnoor Range	DFO28/2010-11	10
27	Adilabad	Adilabad	Conducting Recruitment for the Post of FBOs & ABOs in Adilabad Division	DFO84/2010-11	10

S. No.	Division	Range	Activity	SO. No	Score
28	Achampet	Achampet	Audit fee for the accounts of State CAMPA in Achampet Division during 2009-10	DSO. No. 34/S4/2010-11 dt. 24.07.2010	10
29	Achampet	Achampet	Water and electricity charges for Achmapet Division during 2010-11	DSO. No. 35/S4/2010-11 dt. 29.02.2010	10
30	Achampet	Achampet	Filling posts of FSO's, FBO's and ABO's at Achmapet Division	DSO. No. 65/CAMPA 2010-11 dt. 24.11.2010	10
31	N.Sagar WLM	N.Sagar	Electricity bill for WLM Range Devarakonda period from March 2010 to May 2010.	RSO 5/2010-11	10
32	Siddipet	Siddipet	Estimate for Cell phones Bill Charges in Range Staff O/o. FRO, Siddipet	366/DFO/2010-11	10
33	Kothagudem	Kothagudem	Payment of Legal Charges to the Asst. Junior Govt. Pleader, Court pleader, junior Civil Kothagudem	Rc No 782	10
34	WLM Paloncha	WLM Paloncha	POL charges to DFO WLM Jeep No. AP 36 AH 1662 in Eturunagaram Range	44 2010-11	8

Findings: There were a total of 340 activities under OS undertaken in 2010-2011. OS activities evaluated based on the available records indicated highly satisfactory performance. Most of the expenditure was incurred by Hyderabad followed by Bhadrachalam. The activities in OS evaluated were audit fee payment, water and electricity charges payment, recruitment charges, cell phone charges, telephone bill payment, drinking water, POL charges and other charges.

5.9.9 Infrastructure Development (IDM): IDM activities were undertaken in Telangana State Forest Academy under CAMPA NPV component during the year 2010-2011. The total number of different works under IDM component undertaken by TSFD CAMPA during 2010-2011 is 187. 10% of the total works, 19 samples of IDM which 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 5.9.9. **The total score obtained by IDM is 90 out of 100**.

Fig. 5.9.9. Comparison of New Construction and Maintenance Works under IDM

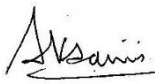
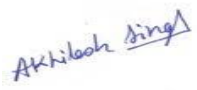
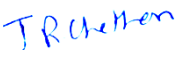
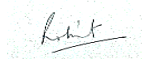


Findings: All the CB activities was undertaken in Telangana State Forest Academy, Dullapally. CB activities full points during evaluation. During the period of 2010-11 several residential quarters for the frontline forest staff and officers were constructed. However in most of the evaluated buildings constructed, cracks were observed on the wall and many of the quarters were having dampness issues. Most of the IDM works were carried out in Hyderabad followed by Bellampally.

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 2010-2011 CAMPA activities is **868.385** out of **1135 i.e. 76.50%** indicating "**moderately satisfactory performance**".

Table 5.10: Overall scoring of TSFD CAMPA undertaken during 2010-2011.

Quantitative Aspects (A)				Qualitative Aspects (B)			
S.	**Main heading**	**Score**	**Total**	**S.**	**Main heading**	**Score**	**Total**
I.	Plantation activities (CA and NPV)	313.67	500	I.	Impact of awareness generation campaign	0.8	5
II	Other activities (CA & NFM)	85.625	100	II.	Identification of approved site for plantation	2.5	5
II.	Forest Protection	132.69	150	III.	Improvement in quality of wildlife habitat	2.2	5
III.	Forest Fire Management	43.5	50	IV.	CAMPA benefits (SC/ST/BPL households)	10	10
IV	Biodiversity Conservation	86.4	100	V.	Project Awareness	2	5
V	Research & Development	19.45	20	VI.	Transparency, maintenance and payments	3	5
VI	Capacity Building	50	50	VII.	Maintenance of assets created	8	10
VII	ICT	9.67	10		-	-	-
VIII	IDM	90	100		-	-	-
IX	Office Support	8.88	10		-	-	-
Total (A)		**839.885**	**1090**	**Total (B)**		**28.5**	**45.00**
Grand Total (A+B)						**868.385**	**1135**

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

5.11 Third party critical comments

1. Project constraints/limitations

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

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

2. Suggestions for improvement

Areas of improving the project output? Specify

a) Involvement of local stakeholders from site selection to maintenance 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 on E-green watch and TGIMS.

4. 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.