

**REPORT  
ON  
THIRD PARTY MONITORING OF WORKS  
CARRIED OUT UNDER CAMPA BY GOA FOREST  
DEPARTMENT DURING 2022-23**



**Evaluated  
by  
Institute of Wood Science and Technology  
(Indian Council of Forestry Research & Education)  
18<sup>th</sup> cross, Malleshwaram PO, Bengaluru 560003,  
Karnataka, India**

## **Acknowledgment**

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We once again extend our sincere thanks to the forest department of Goa for providing us with all the possible support during the evaluation work.

Director  
IWST,  
Bangalore

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Credits: The Goa Forest Department vide its letter Nos..... dated ..... assigned third party external evaluation task to IWSST located at 18<sup>th</sup> cross, Malleshwaram PO, Bengaluru 560003

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## 1.0 Introduction

The Goa Forest Department has established various plantations and carried out an Annual Plan of Operations (APO) from the funds received from CAMPA, Ministry of Environment, Forest and Climate Change (MoEF & CC), New Delhi. The Institute of Wood Science and Technology (IWST), Bengaluru was given the assignment to evaluate the activities carried out by the Goa Forest Department during the years 2022-23 under CAMPA, as a part of a Third-Party evaluation. The field evaluation was carried out by a team of scientists along with technical staff and project fellows during the month of January to July 2023. The team visited all the CAMPA-funded activities in different ranges under North and South Goa Territorial; Wildlife and Ecotourism Research Divisions of South and North Goa; Research and Utilisation Division, Margao; Social Forestry, Parks and Gardens, Ponda; Soil Conservation Division, Ponda; and Goa Forest Development Corporation, Panaji. The details of the places visited and the reports generated Forest range-wise are given below.

**Table Nos. 1 Details of forest ranges evaluated**

<b>Name of the Forest Division</b>	<b>Name of the Forest Range</b>
South Goa Territorial Division	Sanguem Kurdi Quepem Pissonem Canacona
Wildlife and Ecotourism Division (South Goa)	Netravali Wildlife Sanctuary Cotigao Wildlife Sanctuary
North Goa Territorial Division	Panaji Keri Ponda Collem Volpoi Pernem
Wildlife and Ecotourism Division (North Goa)	Mollem Madhei Bondla Campal

Research and Utilisation Division, Margao	Quepem Usgao Panaji Valpoi
Social Forestry, Parks and Gardens, Ponda	Ponda Panaji Quepem
Soil Conservation Division, Ponda	Bhironda Ponda Quepem
Goa Forest Development Corporation, Panaji	Morlem Ponda Quepem Canacona

## 2.0 Methodology

The evaluation of activities carried out under CAMPA in each forest range of the Forest Divisions were carried out in two parts: (i) Evaluation of plantations established as Compensatory Afforestation (CA) and Aided Natural Regeneration (ANR) (ii) Verification of the Annual Plan of Operations (APO).

(i) **Evaluation of Plantations:** The total area of the plantation, date of planting, and details of saplings with their botanical names were noted from the plantation journals maintained for the respective site. 20% of the area was taken for calculating the survival percentage of the plants by having a quadrat size of 33 metre x 33 metres i.e., 0.1 Ha. The number of plants surviving in each plot was recorded. The survival percentage of the site was calculated as given below:

- a) Survival percentage per quadrat =  $\frac{\text{Total number of plants in the quadrat}}{\text{total nos. of plants planted}} \times 100$
- b) Survival percentage in a plot :  $\frac{\text{Sum of survival percentage of all the quadrats}}{\text{total nos. of quadrats}}$

The aided natural regeneration plots were also evaluated using the above-mentioned method.

(ii) **Verification of Annual Plan of Operations (APO):** The details of APO activities carried out in the Forest Ranges were obtained from the concerned range officer. The

activities carried out or executed were physically verified by the team members and status of the APO was noted down. Seedlings produced were verified with the register and from the stocks maintained in the nurseries.

### 3.0 Field observation in South Goa- Territorial Division

In the Territorial Division of South Goa, major activities were carried out under CAMPA during the years 2022-23 in all the forest ranges viz. Sanguem, Kurdi, Quepem, Pissonem and Canacona. The details of plantations established and APO activities carried out in this Division are given below.

**Table Nos. 2 Compensatory Afforestation (CA) plantations in South Goa Territorial Division**

Sl. Nos.	Name of the Forest Range	Area (in Ha)
1.	Sanguem	5.0
2.	Quepem	25.0
3.	Pissonem	10.0
4.	Canacona	50.0
Total		90.0

**Table Nos. 3 Annual Plan of Operations in South Goa Territorial Division**

Sl. Nos.	Name of the Forest Range	Nature of APO activities	Quantity
1	Quepem	Maintenance of 1 year old CA plantation a	55 Ha
		Maintenance of 2-year-old CA plantation	31 Ha
		<b>Nursery Management and seeding raising</b>	
		Raising nursery for CA plantation	1,25,000 Nos.
		Raising nursery for public distribution of seedlings	25,000 Nos.
		Maintenance of old seedlings	1,25,000 Nos.
		<b>Protection of Forests</b>	
		Chain link fencing using R.C.C poles	5.0 R/km
		Eradication of Eupatorium (weeds)	50 Ha

		<b>Forest Fire prevention and control operation</b>	
		Maintenance of firelines	45 R/km
		<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
		Construction of Toilet and repair work for existing office room at Maina.	1 No.
		Construction of Safety Tank at Maina.	1 No.
		Construction of check post at Maina Quepem	1 No.
<b>2</b>	<b>Pissonem</b>	Maintenance of 1-year old plantation	40.0 Ha
		Maintenance of 2-year-old plantation	21.0 Ha
		<b>Forest Fire prevention and control operation</b>	
		Creation of Firelines	<b>35 Km</b>
		Deployment of Fire watchers	11 Nos.
		<b>Protection of Forests</b>	
		Eradication of Eupatorium (weeds)	45 Ha
		Deployment of Trekkers in Govt. Forest areas	16 Nos.
<b>3</b>	<b>Sanguem</b>	Maintenance of 1-year old plantation	25 Ha
		Maintenance of 2-year-old plantation	7.2 Ha
		<b>Management of biodiversity and biological resources</b>	
		Creation of Viewline	4 R/km
		<b>Forest Fire prevention and control operation</b>	
		Creation of Fireline	25.0 R/km
		<b>Protection of Forests</b>	
		Eradication of Eupatorium weeds	10 Ha
<b>4</b>	<b>Kurdi</b>	Maintenance of 1-year old plantation	10.0 Ha
		Maintenance of 2-year-old plantation	5 Ha
		<b>Management of biodiversity and biological resources</b>	
		Creation of Viewline	13 R/km
		<b>Forest Fire prevention and control operation</b>	
		Creation of Fireline	25.0 R/km
<b>3</b>	<b>Canacona</b>	Maintenance of 1-year old plantation	25 Ha



		Maintenance of 2-year-old plantation	25 Ha
		<b>Nursery Management and seeding raising</b>	
		Raising of seedlings for CA plantation	1,55,000 Nos.
		Maintenance of seedlings for public distribution	1,00,000 Nos.
		<b>Management of biodiversity and biological resources</b>	
		Creation of Viewlines	6 R/Km
		<b>Forest Fire prevention and control operation</b>	
		Creation of Fireline	50.0 R/km
		<b>Protection of Forests</b>	
		Eradication of Eupatorium weeds	70 Ha
		<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
		Renovation of quarters	5 Nos.

## 1. Sanguem Forest Range

In Sanguem forest range, Compensatory Afforestation, and Assisted Natural Regeneration was carried out in an area of 15.0 ha during 2022-23. The performance of the plantations and the status of the APOs are discussed below.

**Table Nos. 4 Detail of CA and ANR Plantation in Sanguem Forest Range**

Location of the plantation	Area	Survival Percentage	Remarks
CA plantation, Santona village,	5.0 Ha	78%	The performance of the plantation is good and maintained well.
ANR plantation in Rumbrem village	10.0 Ha	70%	The performance of the plantation is good and maintained well.

### Observations

26 plant species were observed in the evaluated quadrats with a spacing of 4 x 4 meters. The majority of the species were fruit producing species and the plants were healthy. The seedlings/ saplings were procured from various departmental nurseries raised under CAMPA and other state funding. The survival percentage varied from 70% to 78% in different plantations. The overall survival percentage observed is 74%.

**Table Nos. 5 List of species planted in Sanguem Range**

Sl. No	Species Name	Common name	Sl. Nos.	Species Name	Common name
1.	<i>Syzygium cumini</i>	Jambol	14.	<i>Garcinia indica</i>	Bhirand
2.	<i>Dalbergia latifolia</i>	Bayo	15.	<i>Tamarindus indica</i>	Chinch
3.	<i>Phyllanthus emblica</i>	Avalo	16.	<i>Gmelina arborea</i>	Shivan
4.	<i>Mangifera indica</i>	Mango	17.	<i>Pterocarpus marsupium</i>	Hassan
5.	<i>Mimusops elengi</i>	Oval	18.	<i>Syzygium caryophyllanthum</i>	Bhedas
6.	<i>Terminalia tomentosa</i>	Madat	19.	<i>Emblica officinalis</i>	Alaamb
7.	<i>Ficus glomerata</i>	Rumad	20.	<i>Terminalia bellirica</i>	Ghotting
8.	<i>Bambusa bamboo</i>	Bamboo	21.	<i>Bombax ceiba</i>	Sawar
9.	<i>Atrocarpus lakucha</i>	Ottamb	22.	<i>Sapindus mukoross</i>	Rito

10.	<i>Albizzia lebbeck</i>	Siras	23.	<i>Bahunia racemosa</i>	Apto
11.	<i>Psidium gujava</i>	Peru	24.	<i>Mammea suriga</i>	Surgi
12.	<i>Lagerstroemia speciosa</i>	Taman	25.	<i>Alstonia scholaris</i>	Saton
13.	<i>Vateria indica</i>	Dhoop	26.	<i>Pongammia pinnata</i>	Karanj

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 6 Detail of APO activities in Sanguem Forest Range**

Sl. Nos.	Name of the work	Area	Remarks
1.	Maintenance of 1 year old plantation at Sy. No 18 of Santona village	5 Ha	Well maintained
2.	Maintenance of 1 year old ANR plantation at Sy. No 77 of Uguem village and 15 of Salauli village	15 Ha	Well maintained
3.	Maintenance of 1 year old plantation at Sy. No 77 of Uguem village	5 Ha	Well maintained
4.	Maintenance of 2-year-old plantation at Sy. No 18 of Santona village	2 Ha	Well maintained
5.	Maintenance of 2-year-old plantation at Sy. No 23/1 parts of Rumbrem village	5.2 Ha	Well maintained
6.	Eradication of Eupatorium weeds in area of 7 ha in sy.no 55 of Sanvordem village	7 Ha	Carried out
7.	Eradication of Eupatorium weeds in area of 10 ha in sy.no77 of Uguem village	10 Ha	Carried out
8.	Eradication of Eupatorium weeds in area of 4 Rkm in sy.no8 of Bhati village	4 R/km	Carried out
9.	Creation of Fireline at Sy.No 76 of Uguem village	12 R/km	Carried out
10.	Creation of Viewline at Sy.No 77 & 78 of Uguem village	4 R/km	Carried out
11.	Creation of Fireline at Sy.No 56 , 57 & 33 of Rumbrem village 13 RKM	13 R/km	Carried out



**CA plantation field at Santona Village**



**Construction of water pond at Mugoli Uguem village**



**Quadrates selection for survival assessment of plantations in Mugoli beat**



**Well maintained ANR Plantation at Salauli village**



**ANR planting with mixed native species in degraded area**



**Ghotting seedlings are coming up well at Rumbrem village**

## 2. Kurdi Range

10.0 ha of ANR plantations were established in Kurdi Range during the year of assessment (2022-23). The performance of the plantations and the status of the APOs are discussed below.

**Table Nos. 7 Detail of CA and ANR Plantation in Kurdi Forest Range**

Locations of the plantations	Area	Survival Plantation	Remarks
ANR plantation with mixed native species and fruit-bearing species in Vinchudrem	5 Ha	75%	The performance of the plantation is good and maintained well.
ANR plantation with mixed native species and fruit-bearing species in Colomba	5 Ha	75%	The performance of the plantation is good and maintained well.

### Observations

The plantations were raised in open areas and in gaps existing among the existing plantations under Vinchudrem and Colomba Beat. A survival percentage (75%), was observed in the areas where plantations already existed. The overall survival percentage in the area is 75%. The seedlings/ saplings were procured from various departmental nurseries raised under CAMPA and state funding.

**Table Nos. 8 List of major species planted in Kurdi Range**







Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Syzygium cumini</i>	Jambol	9.	<i>Garcinia indica</i>	Bhirand
2.	<i>Dalbergia latifolia</i>	Siso	10.	<i>Tamarindus indica</i>	Chinch
3.	<i>Phyllanthus emblica</i>	Avalo	11.	<i>Fagara budrunga</i>	Trifal
4.	<i>Mangifera indica</i>	Mango	12.	<i>Ficus asperrima</i>	Kharvat
5.	<i>Mimusops elengi</i>	Oval	13.	<i>Syzygium caryophyllantum</i>	Bhedas
6.	<i>Terminalia tomentosa</i>	Madat	14.	<i>Emblca officinalis</i>	Avally
7.	<i>Ficus glomerata</i>	Rumad	15.	<i>Terminalia bellirica</i>	Ghotting
8.	<i>Bambusa bamboo</i>	Bamboo			



**Information about other CAMPA activities as per APO and its details**

**Table Nos. 9 Detail of APO activities in Kurdi Forest Range**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Area</b>	<b>Remarks</b>
1.	Second year maintenance of old CA Plantation in Barren hill Rocky area Portem	5 Ha.	Well maintained
2.	First year maintenance of old CA Plantation in Portem	5 Ha.	Well maintained
3.	First year maintenance of ANR Plantation in Vichudrem	5 Ha.	Well maintained
4.	Eradication of Eupatorium in Vinchudrem	10 Ha.	Carried out
5.	Eradication of Eupatorium in Portem	10 Ha.	Carried out
6.	Eradication of Eupatorium in Curpem	7 Ha.	Carried out
7.	Eradication of Eupatorium in Colomba	7 Ha.	Carried out
8.	Clearance of viewline in Colomba	3 R/Km.	Carried out
9.	Clearance of viewline in Portem	3 R/Km.	Carried out
10.	Clearance of viewline in Curpem	4 R/Km.	Carried out
11.	Clearance of viewline in Vinchudrem	3 R/Km.	Carried out
12.	Creation of Firelines in Curpem	5 R/Km.	Carried out
13.	Creation of Firelines in Colomba	3 R/Km.	Carried out
14.	Creation of Firelines in Colomba	3 R/Km.	Carried out
15.	Creation of Firelines in Portem	4 R/Km.	Carried out
16.	Creation of Firelines in Vinchudrem	5 R/Km.	Carried out
17.	Creation of Firelines in Vinchudrem	5 R/Km.	Carried out

	
<p><b>Creation of a Nature Trail at Vichundrem Beat</b></p>	<p><b>Survival assessment of a ANR plantation in Colomba village</b></p>
	
<p><b>Peepal seedling grown at CA plantation, Kurdi</b></p>	<p><b>Well-maintained plantation at Vichundrem Beat</b></p>
	
<p><b>Maintenance of old CA Plantation in Portem</b></p>	<p><b>Ghotting seedling well grown at CA plantation, Kurdi</b></p>

### 3. Quepem

Plantation activities for 25 Ha and various APO activities were undertaken in this range. The performance of the plantations and the status of the APOs are discussed below.

#### Information about CA plantations under CAMPA 2022-23 in Quepem Range

**Table Nos. 10 Detail of CA Plantation in Quepem Forest Range**

Locations of the plantations	Area	Survival Percentage	Remarks
CA plantation in, Cavrem Beat	15.0 Ha	80%	Established and performing well.
CA plantation in, Keri Beat	10.0 Ha	82%	Established and performing well.

#### Observations

The CA plantations were established in three different locations within the range. The observations made for the location and the performance of the plantation are given in the above Table Nos. 11. In general, all the plantations were performing well with healthy plants. About 27 tree species were planted in all the plantations with varying spacings of 3 x 3 and 4x4 metres. The survival percentage of the plots varied from 80 to 82%, with an average survival percentage of 81%.

**Table Nos. 11 List of major species planted in Quepem Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Ficus glomerata</i>	Rumod	15.	<i>Gmelina arborea</i>	Shivon
2.	<i>Ficus religiosa</i>	Pimpal	16.	<i>Pterocarpus marsupium</i>	Hassan
3.	<i>Alstonia scholaris</i>	Saton	17.	<i>Artocarpus heterophyllus</i>	Jack
4.	<i>Pongamia pinnata</i>	Karanj	18.	<i>Mimusops elengi</i>	Oval
5.	<i>Terminalia tomentosa</i>	Madat	19.	<i>Lagerstroemia lanceolata</i>	Taman
6.	<i>Dendrocalamus strictus</i>	Bamboo	20.	<i>Vateria indica</i>	Dhoop
7.	<i>Emblica officinalis</i>	Avalo	21.	<i>Mangifera indica</i>	Mango
8.	<i>Syzygium cumini</i>	Jambal	22.	<i>Psidium guajava</i>	Peru
9.	<i>Adina cordifolia</i>	Hedu	23.	<i>Garcinia indica</i>	Bhirand
10.	<i>Tamarindus indica</i>	Chinch	24.	<i>Pongamia pinnata</i>	Karanj
11.	<i>Aegle marmelos</i>	Bel	25.	<i>Bombax ceiba</i>	Sawar
12.	<i>Holoptelea integrifolia</i>	Vavlo	26.	<i>Cassia fistula</i>	Bayo



13.	<i>Dalbergia latifolia</i>	Sisum	27.	<i>Sapindus trifoliatus</i>	Rito
14.	<i>Terminalia bellirica</i>	Ghoting			

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 12 Detail of APO activities in Quepem Forest Range**

Sl. Nos.	Name of the work	Area	Remarks
1.	Raising of seedlings in 5'x8' polybags of local fruit bearing species for CA plantation in Sy. Nos. 14/1 of Bendurdem village.	50,000 Nos.	Carried out
2.	Raising of seedlings in 5'x8' polybags of indigenous timber and other species for CA plantation in Sy. Nos. 14/1 of Bendurdem village.	60,000 Nos.	Carried out
3.	Raising of seedlings in 8'x12' polybags for CA plantation at Condinol Nursery in Sy. Nos. 14/1 of Bendurdem village.	15000 Nos.	Carried out
4.	Raising of seedlings in 5'x8' polybags for public distribution at Condinol Nursery in Sy. Nos. 14/1 of Bendurdem village.	25000 Nos.	Carried out
5.	Maintenance of CA plantation and enrichment, densification work of raised old seedlings 5'x8' at Condinol Nursery in Sy. Nos. 14/1 of Bendurdem village.	1,25,00 Nos.	Carried out
6.	Maintenance of 1 year old CA plantation at Rivona.	18Ha	Executed and well maintained
7.	Maintenance of 1 year old CA plantation at Molcarnem.	12Ha	Executed and well maintained
8.	Maintenance of 1 year old CA plantation at Rivona.	10Ha	Executed and well maintained
9.	Maintenance of 1 year old ANR plantation at Molcarnem.	15Ha	Executed and well maintained
10.	Maintenance of 2-year-old CA plantation at Rivona.	14Ha	Executed and well maintained
11.	Maintenance of 2-year-old CA plantation at Rivona.	2Ha	Executed and well maintained
12.	Maintenance of 2-year-old ANR plantation at Molcarnem.	15Ha	Executed and well maintained
13.	Chain link fencing using R.C.C poles at 3.5m intervals	3.5 R/km	Carried out

	in Sy. No 171 of Rivona village.		
14.	Chain link fencing using R.C.C poles at 3.5m intervals in Sy. No 159/3 of Rivona village.	1.5 R/km	Carried out
15.	Eradication of Eupatorium (weeds) in Govt. Forest Area. Sy. Nos. 64 Village Maina	12Ha	Carried out
16.	Eradication of Eupatorium (weeds) in Govt. Forest Area. Sy. Nos. 56/0 Village Balli	10Ha	Carried out
17.	Eradication of Eupatorium (weeds) in Govt. Forest Area. Sy. Nos. 36/1 Village Pirla	15Ha	Carried out
18.	Eradication of Eupatorium (weeds) in Govt. Forest Area. Sy. Nos. 25 Village Bendurdem.	5Ha	Carried out
19.	Eradication of Eupatorium (weeds) in Govt. Forest Area. Sy. Nos. 142 Village Rivona.	8Ha	Carried out
20.	Eradication of Eupatorium (weeds) in Govt. Forest Area. Sy. Nos. 109 Village Rivona.	10Ha	Carried out
21.	Maintenance of firelines & fire management laid in Govt. Forest at Pirla in Sy. Nos. 41	10Rkm	Carried out
22.	Maintenance of firelines & fire management laid in Govt. Forest at Sirvoi in Sy. Nos. 44 of sirvoi village & Sy. Nos. 13,14,15 & 16 of Molcarnem village.	10Rkm	Carried out
23.	Maintenance of firelines & fire management laid in Govt. Forest at Quinamol Rivona Sy. Nos. 109.	10Rkm	Carried out
24.	Maintenance of firelines & fire management laid in Govt. Forest at Bendurdem Sy. Nos. 25	5Rkm	Carried out
25.	Maintenance of firelines & fire management laid in Govt. Forest at Sulcorna Sy. Nos. 11	5Rkm	Carried out
26.	Maintenance of firelines & fire management laid in Govt. Forest at Rivona in Sy. Nos. 143 & 159/3.	5Rkm	Carried out
27.	Maintenance of firelines & fire management laid in Govt. Forest in Sy. Nos. 90 & 93 of Adnem village and Sy. Nos. 21 of Balli village.	5Rkm	Carried out
28.	Grass cutting in 1 year old ANR Plantation at Molcarnem in Sy. Nos. 116.	5Ha	Carried out
29.	Grass cutting in 1 year old CA Plantation at Molcarnem in Sy. Nos. 116.	5Ha	Carried out
30.	Grass cutting in 2-year-old CA Plantation at Rivona in Sy. Nos. 65.	2Ha	Carried out
31.	Grass cutting in 2-year-old ANR Plantation at Molcarnem in Sy. Nos. 116.	10Ha	Carried out
32.	Grass cutting in 1 year old CA Plantation at Rivona in Sy. Nos. 171.	10Ha	Carried out
33.	Grass cutting in New CA Plantation at Rivona Sy. Nos. 171.	10Ha	Carried out
34.	Providing, fixing steel work and electrification of A type Quarters at Forest Colony Quepem	1Nos.	Carried out
35.	Repair, painting and other minor works of A type Quarters at Forest Colony Quepem	1Nos.	Carried out
36.	Providing and fixing of Galvalisum sheet for (Entrance) 3 A type quarters at Forest Colony Quepem.	1Nos.	Carried out
37.	Construction of Toilet and repair work for existing	1Nos.	Carried out

	office room at Maina.		
38.	Providing and fixing Vitrified Tiles, Aluminium Windows and Wiring for Existing Room at Maina	1Nos.	Carried out
39.	Construction of Safety Tank at Maina.	1Nos.	Carried out
40.	Construction of check post at Maina Quepem	1Nos.	Carried out
41.	Providing and Fixing Roofing, Painting and Electric work for check post at Maina Quepem	1Nos.	Carried out



#### 4. Pissonem Range

Plantation activities for 20 Ha and various APO activities were undertaken in this range. The performance of the plantations and the status of the APOs are discussed below.

##### Information about CA plantations under CAMPA 2022-23 in Pissonem Range

**Table Nos. 13 Detail of CA and ANR Plantation in Pissonem Forest Range**

Locations of the plantations	Area	Survival Percentage	Remarks
ANR Plantation, Gocoldem Village	10 Ha	82%	The plants are growing well and the plantation was maintained well.
CA Plantation, Padi Village, Padi Beat	10 Ha	85%	The plants are growing well and the plantation was maintained well.

##### Observations

This range had 20 Ha of plantations established under CAMPA. About 19 species were planted, of which most of them were fruit yielding tree species. The plantations were healthy and maintained well and the survival of the seedlings varied from 82% to 85%. Overall, the survival percentage was 83.5%. Saplings were received from the nursery established for this purpose and also from other nurseries of the forest department.

**Table Nos. 14 List of major species planted in Pissonem Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Eugenia jambolana</i>	Jambol	11.	<i>Tamarindus indica</i>	Chinch
2.	<i>Dalbergia latifolia</i>	Siso	12.	<i>Fagara budrunga</i>	Trifal
3.	<i>Phyllanthus emblica</i>	Avalo	13.	<i>Ficus asperrima</i>	Kharvat
4.	<i>Mangifera indica</i>	Mango	14.	<i>Syzygium caryophyllantum</i>	Bhedas
5.	<i>Mimusops elengi</i>	Oval	15.	<i>Emblica officinalis</i>	Avally
6.	<i>Terminalia Tomentosa</i>	Madat	16.	<i>Terminalia bellirica</i>	Ghotting
7.	<i>Terminalia catappa</i>	Badam	17.	<i>Psidium guajava</i>	Peru
8.	<i>Ficus religiosa</i>	Pipal	18.	<i>Annona squamosa</i>	Sitaphal
9.	<i>Bamboo sps.</i>	Bamboo	19.	<i>Ficus racemosa</i>	Rumad
10.	<i>Garcinia indica</i>	Bhirand			







##### Information about other CAMPA activities as per APO and its details

**Table Nos. 15 Detail of APO activities in Pissonem Forest Range**

<b>Sl. No</b>	<b>Name of the work</b>	<b>Area</b>	<b>Remarks</b>
1.	Maintenance of 1 year old 2022-23-22 CA plantation in Sy.Nos.1/0 of Padi village, 1000 Nos. (6(a) of CAF, Act)	5.0 Ha	Maintained well.
2.	Maintenance of 2-year-old 2020-21 CA plantation in Sy.Nos.12/0 of Padi village(6(a) of CAF, Act)	2.0 Ha	Carried out
3.	Maintenance of 2-year-old 2020-21 CA plantation in Sy.Nos.16/0 of Padi village. (6(a) of CAF, Act)	1.0 Ha	Carried out
4.	Maintenance of 2-year-old 2020-21 CA plantation, in Sy.Nos.114/0 of Barcem village. (6(a) of CAF, Act)	3.0 Ha	Carried out
5.	Maintenance of 2-year-old 2020-21 CA plantation in Sy.Nos.23/0 of Barcem village (6(a) of CAF, Act)	5.0 Ha	Work was executed well.
6.	Maintenance of 1 year old 2022-23-22 ANR plantation in Sy.Nos.1/0 of Padi village, 2500 Nos. (6(a) of CAF, Act)	20.0 Ha	Work was executed well.
7.	Creation of Firelines in Sy.Nos.114 & 23 of Barcem Village (10 kms).	10 Kms	Carried out
8.	Creation of Firelines in Sy.Nos.23 of Cordem Village & Sy.Nos.10, 12, 1 of Padi Village (05 kms).	5 Kms	Carried out
9.	Creation of Firelines in Sy.Nos.12/0 of Padi Village (05 kms).	5 Kms	Carried out
10.	Creation of Firelines in Sy.Nos.32/0 of Padi Village (05 kms).	5 Kms	Carried out
11.	Eradication of Eupatorium (weeds) over an area of 10 ha in Govt. Forest area under survey.Nos. 100 of Canacona Village.	10 Ha	Carried out
12.	Eradication of Eupatorium (weeds) over an area of 10ha in Govt. Forest area under survey.Nos. 1/0 of Padi Village.	10 Ha	Carried out
13.	Eradication of Eupatorium (weeds) over an area of 10 ha in Govt. Forest area under survey.Nos. 29/0 of Quedem Village.	10 Ha	Carried out
14.	Maintenance of 1 year old 2022-23-22 CA plantation in Sy.Nos.39/0 of Tiloi village, (Phase- II) 1000Nos.(6(a) of CAF, Act)	5 Ha	Carried out
15.	Maintenance of 1 year old 2022-23-22 CA plantation in Sy.Nos.39/0 of Tiloi village, 2000 Nos. (6(a) of CAF, Act)	10 Ha	Carried out
16.	Maintenance of 2-year-old 2020-21 CA plantation in Sy.Nos.402 of Cola village (6(a) of CAF, Act)	5 Ha	Carried out
17.	Maintenance of 2-year-old 2020-21 CA plantation, in Sy.Nos.402 of Cola village (Phase-II) (6(a) of CAF, Act)	5 Ha	Carried out
18.	Watch and ward for 1 year old (2022-23-22) 5ha, CA plantation (Phase- II). Sy.Nos.39/0 of Tiloi village	1 Nos.	Carried out
19.	Watch and ward for 1 year old (2022-23-22) 10ha, CA plantation. Sy.Nos.39/0 of Tiloi village	1 Nos.	Carried out

20.	Creation of Firelines in Sy.Nos.39/0 of Tiloi village (05 kms).	5 kms	Carried out
21.	Creation of Firelines in Sy.Nos.402 of Cola Village (05 kms).	5 kms	Carried out
22.	"Eradication of Eupatorium (weeds) over an area of 05ha in Govt. Forest area under survey.Nos. 39/0 of Tiloi Village.	5 Ha	Carried out
23.	Eradication of Eupatorium (weeds) in Govt. Forest area under survey.Nos. 402 of Cola Village.	15 Ha	Carried out
24.	Creation of Firelines in Sy.Nos.100, 103 & 110 of Canacona Village	10 Kms	Carried out
25.	Creation of Firelines in Sy.Nos.92/0 of Canacona village	5 Kms	Carried out
26.	Eradication of Eupatorium (weeds) in Govt. Forest area under survey.Nos. 110 of Canacona Village.	10 Kms	Carried out
27.	Eradication of Eupatorium (weeds) in Govt. Forest area under survey.Nos. 92 of Canacona Village.	15 Kms	Carried out
28.	Deployment of 06Nos. Trekkers in Govt. Forest areas under jurisdiction of Pissonem Range.	-	Carried out
29.	Deployment of 10Nos. firewatchers in Govt. Forest areas under jurisdiction of Pissonem Range.	-	Carried out
30.	Protection of forest and wild life by engaging trekkers.	-	Carried out
31.	Engagement of firewatchers for prevention of forest fire.	-	Carried out
32.	Protection of Wild Life by engaging rescuers.	-	Carried out
33.	Engagement of firewatchers for prevention of forest fire.	-	Carried out
34.	Protection of forest and wild life by engaging trekkers. (5(2)(d))	-	Carried out



	
<p><b>Maintenance of CA plantation in Padi Beat</b></p>	<p><b>CA plantation of mixed fruit-bearing and native species at Padi Beat</b></p>
	
<p><b>Well maintained seedlings growing at CA plantation in Padi Beat</b></p>	<p><b>A well-maintained CA plantation at Tiloi Beat</b></p>
	
<p><b>Jack seedling well grown in ANR plantation</b></p>	<p><b>Sissoo seedling grown at Cola plantation</b></p>



## 5. Canacona Range

Plantation activities for 80 Ha and various APO activities were undertaken in this range. The performance of the plantations and the status of the APOs are given in detail below.

### Information about CA and ANR plantations under CAMPA 2022-23 in Canacona Range

**Table Nos. 16 Detail of CA and ANR Plantation in Canacona Forest Range**

Locations of the plantations	Area	Survival Percentage	Remarks
CA plantation at Ambadafond Beat	25 Ha	80%	Established and performing well
CA plantation at Ambadafond Beat	20 Ha	85%	Established and performing well
CA plantation at Amona Beat	5 Ha	82%	Established and performing well
ANR plantation at Gaondongrem village	15 Ha	78%	Established and performing well
ANR plantation at Poinguinim village	6.5 Ha	75%	Established and performing well
ANR plantation at Poinguinim village	8.5 Ha	72%	Established and performing well

### Observations

A total of 80 Ha area is planted in Canacona Range under CAMPA 2022-23. Majority of the plants were planted in the area were fruit bearing species but bamboos and canes were mainly used in gap planting. The plants were healthy and growing well. The survival percentage of the plantations varies from 72 to 85%, with an average survival percentage of 78.6%. The seedlings/ saplings were procured from various departmental nurseries raised under CAMPA and state funding.

**Table Nos. 17 List of major species planted in Canacona Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Embllica officinalis</i>	Avla	10.	<i>Ziziphus jujuba</i>	Bora
2.	<i>Bambusa bamboos</i>	Bamboo	11.	<i>Cassia fistula</i>	Bayo
3.	<i>Calamus erectus</i>	Canes	12.	<i>Acacia catechu</i>	Khair
4.	<i>Syzygium cumini</i>	Jambal	13.	<i>Gmelina arborea</i>	Shivan
5.	<i>Syzygium caryophyllatum</i>	Bedas	14.	<i>Pterocarpus</i>	Hassan

				<i>marsupium</i>	
6.	<i>Garcinia indica</i>	Bhirand	15.	<i>Terminalia bellirica</i>	Gotting
7.	<i>Lagerstroemia speciosa</i>	Taman	16.	<i>Mimusops elengi</i>	Oval
8.	<i>Dalbergia sissoo</i>	Shisam	17.	<i>Mangifera indica</i>	Mango
9.	<i>Tamarindus indica</i>	Chinch			

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 18 Detail of APO activities in Canacona Forest Range**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1.	Raising of seedlings for CA plantation work at Ozrem Nursery	75,000 Nos.	Carried out
2.	Raising of seedlings for CA plantation work at Ozrem Nursery	75,000 Nos.	Carried out
3.	Maintenance of seedlings for public distribution	25,000 Nos.	Carried out & in good condition
4.	Maintenance of seedlings for public distribution	75,000 Nos.	Carried out & in good condition
5.	Maintenance of 1- year old CA plantation in Poinguinim village.	4 Ha	Carried out & in good condition
6.	Maintenance of 1- year old CA plantation in Poinguinim village.	11 Ha	Carried out & in good condition
7.	Maintenance of 1- year old CA plantation in Poinguinim village.	3 Ha	Carried out & in good condition
8.	Maintenance of 1- year old ANR plantation in Poinguinim village.	10 Ha	Carried out & in good condition
9.	Maintenance of 1-year old mix native species plantation, Gaondongrem	2.5 Ha	Carried out & in good condition
10.	Maintenance of 1-year old Canes, Bamboo and mixed native species plantation, Loliem Beat, Poinguinim	7.5 Ha	Carried out & in good condition
11.	Maintenance of 1-year old Canes, Bamboo and mixed native species plantation at Cotigao	12 Ha	Carried out and in good

			condition
12.	Eradication of weed at Amona	20 Ha	Carried out
13.	Eradication of weed at Chapoli	20 Ha	Carried out
14.	Eradication of weed at Ambadafond	20 Ha	Carried out
15.	Eradication of weed at Tirwal	10 Ha	Carried out
16.	Engagement of Trekker Kindalkatta	146 M days	Carried out
17.	Engagement of Trekker Amadafond	146 M days	Carried out
18.	Engagement of Trekker Sheller	146 M days	Carried out
19.	Engagement of Trekker Tirwal&Pollem	292 M days	Carried out
20.	Engagement of Trekker Avem	120 M days	Carried out
21.	Engagement of Firewatcher Pollem&Loliem	188 M days	Carried out
22.	Engagement of Firewatcher Edda&Amadafond	188 M days	Carried out
23.	Engagement of Firewatcher Avem&Kindalkatta	188 M days	Carried out
24.	Engagement of Firewatcher Chapoli	94 M days	Carried out
25.	Engagement of Firewatcher Karvem	42 M days	Carried out
26.	Maint/creation of firelinesMonem beat	5Km	Carried out
27.	Maint/creation of firelinesLoliem beat	5Km	Carried out
28.	Maint/creation of firelinesTirwal beat	5Km	Carried out
29.	Maint/creation of firelinesEdda beat	10Km	Carried out
30.	Maint/creation of firelinesChapoli beat	5Km	Carried out
31.	Maint/creation of firelines Sheller beat	10Km	Carried out
32.	Maint/creation of firelinesAmona beat	5Km	Carried out
33.	Maint/creation of firelinesKinalkatta beat	5Km	Carried out
34.	Creation of viewlineTirwal Beat Sy.Nos.38	1km	Carried out
35.	Creation of viewlineEdda Beat	2km	Carried out
36.	Creation of viewlineTirwal Beat Sy.Nos.42	1km	Carried out
37.	Creation of viewlineMonem Beat	2km	Carried out
38.	Engagement of firewatcher at Shisheval Round (Feb,2023 to March,2023)	400 M days	Carried out
39.	Engagement of Trekker at Shisheval Round	400 M days	Carried out
40.	Maint/creation of firelines along cashew pltn.	134 M.days	Carried out
41.	Maint/creation of firelines along cashew pltn.	544 M.days	Carried out
42.	Maint/creation of firelines along cashew pltn.	11 Km.	Carried out
43.	Maint/creation of firelines along cashew pltn.	115 M.days	Carried out
44.	Maint/creation of firelines along cashew pltn.	201 M.days	Carried out
45.	Chainlink fencing at 6.5 ha ANR pltn	150 meters	Carried out
46.	Chainlink fencing at 6.5 ha ANR pltn	150 meters	Carried out
47.	Maintenance of Nursery Shed	-	Carried out
48.	Maintenance of Nursery Shed	-	Carried out
49.	Supply of material to Nursery	-	Carried out
50.	Renovation repair of Unit-III “A” type Quarters at Sheller colony	-	Carried out

51.	Renovation repair of Unit-III “A” type Quarters at Sheller colony	-	Carried out
52.	Renovation repair of Unit-III “A” type Quarters at Sheller colony	-	Carried out
53.	Renovation repair of Unit-III “A” type Quarters at Sheller colony	-	Carried out
54.	Additional Renovation repair of Unit-III “A” type Quarters at Sheller colony	-	Carried out
55.	Engagement of Watch & ward at Cotigao	25 Ha	Carried out
56.	Engagement of Watch & ward at Cotigao	956 M days	Carried out
57.	Brushwood fencing for CA pltn. at Cotigao	1000 m	Carried out
58.	Engagement of Watch & ward in Poinguinm Pltn.	225 M days	Carried out
59.	Brushwood fencing for CA pltn. at Poinguinm Pltn.	1250 m	Carried out



**Physical verification of raised nursery seedlings for CA plantation, public distribution at Ozorem nursery**



**Maintenance of ANR plantation at Poinguinim village**



**ANR plantation at Amona Beat**



**Well-maintained CA plantation at Ambadafond Beat**



**Seedling (Oval) casualty due to wild animals grazing at Ambodafond Beat,**



**Well-maintained seedling growing at ANR plantation in Amona Beat**



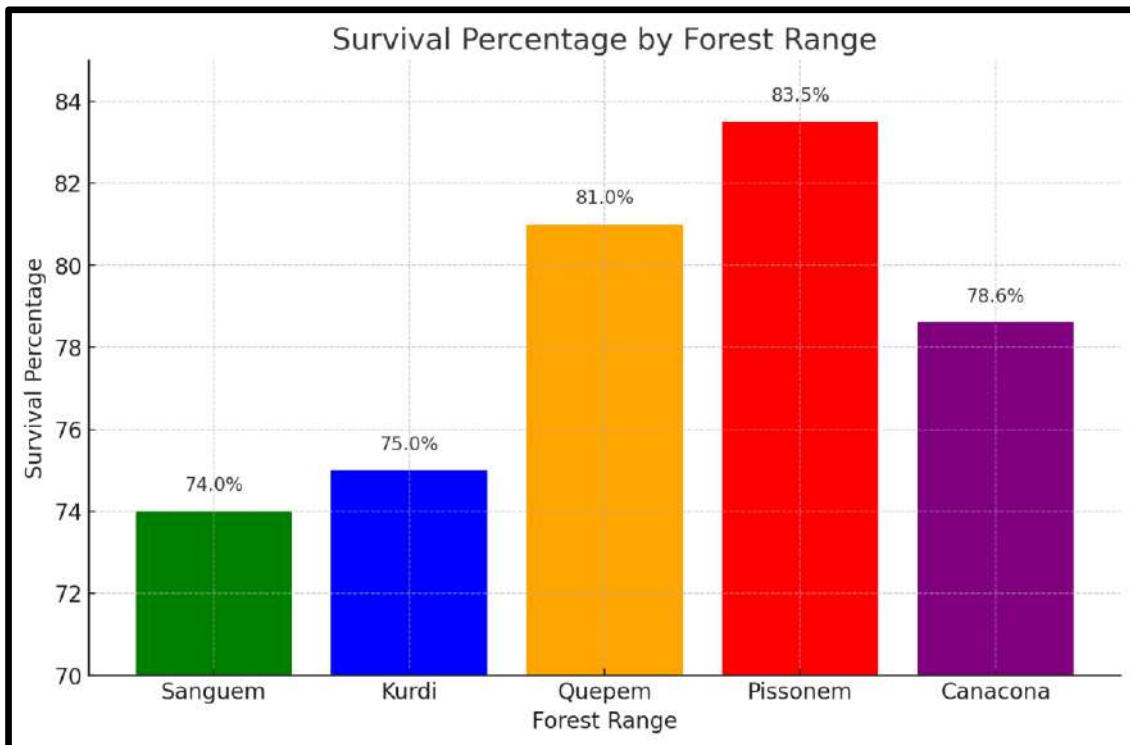


Figure 1: Bar graph illustrating the survival percentage of species across different forest ranges under South Goa Territorial ranges.

The survival rate analysis of forest ranges reveals several positive outcomes. Pissoneem has the highest survival rate at 83.5%, indicating optimal conditions or management practices. Quepem (81%) and Canacona (78.6%) also demonstrate strong performance, reflecting well-maintained environments. Kurdi, at 75%, remains stable and shows potential for improvement. Sanguem, with a 74% survival rate, provides a solid baseline and opportunities for targeted enhancements.

## 4.0 Field observations in South Goa Wildlife & Ecotourism Division

In the South Goa Wildlife and Ecotourism Division, major activities were carried out under CAMPA during the years 2022-23 in Netravali Wildlife Sanctuary and Cotigao Wildlife Sanctuary. Both the plantations and the APOs were visited to evaluate the work carried out in the wildlife ranges and the details are given range-wise.

### Information about CA plantations under CAMPA 2022-23 in South Goa Wildlife and Ecotourism Division

**Table Nos. 19 Detail of CA Plantation in South Goa Wildlife and Ecotourism Division**

Name of the Range	Area
Netravali Wildlife sanctuary	5 Ha
Cotigao Wildlife Sanctuary	5 Ha
Total	10 Ha

### Information about APO activities under CAMPA 2022-23 in South Goa Wildlife and Ecotourism Division

**Table Nos. 20 Detail of APOs in South Goa Wildlife and Ecotourism Division**

Name of the Range	Nature of APO activities	Quantity
Netravali Wildlife sanctuary	Maintenance of 1 year old plantation	27 Ha
	<b>Nursery Management and seeding raising</b>	
	Raising of Nursery seedlings for Public Distribution	25000 Nos.
	<b>Management of biodiversity and biological resources</b>	
	Creation of nature trail	1 Nos.
	Construction of labour shed	1 Nos.
	<b>Protection of forests</b>	
	Removal of invasive weeds	20 Ha
	<b>Wildlife and habitat improvement</b>	
	Maintenance/Desilting of Water Hole	39 Nos.

		<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
		Installation and display of signages in PA's and roads	10 Nos.
Cotigao Wildlife Sanctuary		Maintenance of 1 year old CA plantation	17 Ha
		Maintenance of 1 year old ANR plantation	11 Ha
		<b>Nursery Management and seeding raising</b>	
		Raising of Seedlings Nursery at nursery	100000 Nos.
		<b>Management of biodiversity and biological resources</b>	
		Creation of grass plots	3 Nos.
		<b>Forest protection</b>	
		Clearing fire line (1 Km)	4 Nos.
		Clearing fire line (2 Km)	3 Nos.
		Clearing fire line (5 Km)	2 Nos.
		<b>Construction &amp; maintenance of residential and official buildings for frontline staff</b>	
		Repair of staff quarters	3 Nos.
		Supply of Wooden Finish R.C.C Benches	1 Nos.
		Providing and fixing informative boards	3 Nos.
		<b>Wildlife and habitat improvement</b>	
		Desilting and Maintenance of waterhole	22 Nos.



## 1. Netravali Wildlife Sanctuary

### Information about CA plantations under CAMPA 2022-23 in Netravali Wildlife Sanctuary

The total area of plantation under CAMPA 2022-23 in Netravali Wildlife Sanctuary was 15 Ha and the major locations of the plantation area and its survival details are given below.

**Table Nos. 21 Detail of CA and ANR Plantation in Netravali Wildlife Sanctuary**

Locations of the plantations	Area	Survival %	Remarks
CA plantation at Salaulim	5 Ha	84%	Carried out and maintained properly
ANR plantation at Bandwada	10 Ha	80%	Carried out and maintained properly

#### Observations

A total of 20 Ha is planted in Netravali Wildlife Sanctuary under CAMPA 2022-23. Wild and indigenous plants have been carefully selected as planting stocks in both locations. About 18 different species of fruit-bearing and wildlife-important plants have been planted. The growth of seedlings in degraded hilly areas was given extra care and the survival was very good. The survival percentage varied from 80 to 84% and the overall survival percentage was 82%. The seedlings planted were raised in the nurseries established by the Goa Forest Department to meet the requirements. The seedlings were raised to fill the gaps left by mining dumps, casualties caused by wild animal disturbances, and drought.

**Table Nos. 22 List of major species planted in Netravali Wildlife Sanctuary**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Emblica officinalis</i>	Avla	10.	<i>Cassia fistula</i>	Bayo
2.	<i>Albizia lebbek</i>	Sirus	11.	<i>Acacia catechu</i>	Khair
3.	<i>Artocarpus heterophyllus</i>	Jack	12.	<i>Gmelina arborea</i>	Shivan
4.	<i>Psidium guajava</i>	Peru	13.	<i>Terminalia bellirica</i>	Gotting
5.	<i>Bambusa bamboos</i>	Bamboo	14.	<i>Terminalia arjuna</i>	Arjun
6.	<i>Syzygium cumini</i>	Jambal	15.	<i>Mimusops elengi</i>	Oval
7.	<i>Garcinia indica</i>	Bhirand	16.	<i>Mangifera indica</i>	Mango

8.	<i>Dalbergia sissoo</i>	Sissum	17.	<i>Alstonia scholaris</i>	Saton
9.	<i>Tamarindus indica</i>	Chinch	18.	<i>Vateria indica</i>	Dhoop

**Table Nos. 23 Detail of APO activities carried out in Netravali Wildlife Sanctuary**

<b>Sl. Nos.</b>	<b>Name of work</b>	<b>Qty/area</b>	<b>Remarks</b>
1.	Maintenance of one year old plantation at Netravali	10 Ha	Carried out and maintained well.
2.	Maintenance of two-year-old plantation at Potrem	10 Ha	Carried out and maintained well.
3.	Maintenance of two-year-old plantation at Bandawada	10 Ha	Carried out and maintained well.
4.	Maintenance of three-year-old plantation at Shingonem	3 Ha	Carried out and maintained well.
5.	Maintenance of one year old plantation at Salaulim	4 Ha	Carried out and maintained well.
6.	Maintenance of one year old plantation at Bhati	5 Ha	Carried out and maintained well.
7.	Maintenance of one year old plantation at Potrem	5 Ha	Carried out and maintained well.
8.	Removal of invasive species like Eupatorium for habitat improvement & biological diversity enrichment at Bhadawada	5 Ha	Carried out
9.	Removal of invasive species like Eupatorium for habitat improvement & biological diversity enrichment at Shingonem	5 Ha	Carried out
10.	Removal of invasive species like Eupatorium for habitat improvement & biological diversity enrichment at Maida	5 Ha	Carried out
11.	Removal of invasive species like Eupatorium for habitat improvement & biological diversity enrichment at Bhati	5 Ha	Carried out
12.	Removal of invasive species like Eupatorium for habitat improvement & biological diversity enrichment at Potrem	5 Ha	Carried out
13.	Creation of new fire lines at Bandawada	3 Kms	Carried out
14.	Creation of new fire lines at Netravali	2 Kms	Carried out
15.	Creation of new fire lines at Mangal	2 Kms	Carried out
16.	Creation of new fire lines at Maida	5 Kms	Carried out
17.	Creation of new fire lines at Patiém	5 Kms	Carried out

18.	Creation of new fire lines at Bhati	3 Kms	Carried out
19.	Maintenance/Desilting of water hole at Mangal	2 Nos.	Carried out
20.	Maintenance/Desilting of water hole at Cumari	7 Nos.	Carried out
21.	Maintenance/Desilting of water hole at Potrem	4 Nos.	Carried out
22.	Maintenance/Desilting of water hole at Patiem	5 Nos.	Carried out
23.	Maintenance/Desilting of water hole at Shingonem	4 Nos.	Carried out
24.	Maintenance/Desilting of water hole at Maida	4 Nos.	Carried out
25.	Maintenance/Desilting of water hole at Bhati	8 Nos.	Carried out
26.	Maintenance/Desilting of water hole at Bandawada	2 Nos.	Carried out
27.	Maintenance/Desilting of water hole at Netravali	3 Nos.	Carried out
28.	Maintenance and repair of Road at Mainapi water fall road	-	Carried out
29.	Installation & Display of singages in PA's & adjoining major roads for safety of Wildlife crossing in NWLS	-	Carried out
30.	Construction of Labour shed with Dining area for labour and staff of Netravali Wildlife Sanctuary	-	Carried out
31.	Creation of Nature trail with Signages on the path	-	Carried out
32.	Supply of Prefabricated benches	-	Carried out



**Physical assessment of raised nursery seedlings for CA plantation, public distribution at Netravali Wildlife Sanctuary**



**Well maintained ANR plantation at Bandwada**



**Maintenance of old CA plantation at Portem**



**CA plantation (vetiver grass) in mining pits at Potrem beat, Netravali WL**



**Ficus seedling well grown at CA plantation, Salaulim**



**Caryota urens seedling well grown at CA plantation, Salaulim**

## 2. Cotigao Wildlife Sanctuary

### Information about CA plantations under CAMPA 2022-23 in Cotigao Wildlife Sanctuary

The total area of plantation under CAMPA 2022-23 in Cotigao Wildlife Sanctuary is 15 Ha and the major locations of the plantation area and its survival details are given below.

**Table Nos. 24 Detail of CA and ANR Plantation in Cotigao Wildlife Sanctuary**

Locations of the plantations	Area	Survival %	Remarks
CA plantation at Khalchi-Tirwal	5 Ha	85%	Carried out and in good condition
ANR plantation at Zambolim beat	5 Ha	75%	Carried out and in good condition
ANR plantation at Endrem beat	5 Ha	78%	Carried out and in good condition

### Observations

A total of 20 Ha is planted in Cotigao Wildlife Sanctuary under CAMPA 2022-23. Plantations were established in three beats Tirwal, Kadamaddi Nadke and Endrem beats). About 28 different species of fruit-bearing and wildlife important plants have been planted. The survival percentage varied from 75-85% and the average survival was 79.3% in the Cotigao range. The saplings were procured from various departmental nurseries raised under CAMPA and state funding.

**Table Nos. 25 List of major species planted in Cotigao Wildlife Sanctuary**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Embllica officinalis</i>	Avla	15.	<i>Eugenia jambolana</i>	Zambal
2.	<i>Vateria indica</i>	Dhoop	16.	<i>Annona squamosa</i>	Sitafal
3.	<i>Garcinia indica</i>	Bhirand	17.	<i>Mangifera indica</i>	Mango
4.	<i>Psidium guajava</i>	Peru	18.	<i>Cassia fistula</i>	Bayo
5.	<i>Mimusops elengi</i>	Oval	19.	<i>Alstonia scholaris</i>	Saton
6.	<i>Albizia lebbeck</i>	Sirus	20.	<i>Artocarpus lacucha</i>	Otamb
7.	<i>Bauhinia racemosa</i>	Apto	21.	<i>Artocarpus heterophyllus</i>	Jack
8.	<i>Terminalia bellirica</i>	Ghoting	22.	<i>Acacia catechu</i>	Khair
9.	<i>Tamarindus indica</i>	Chinch	23.	<i>Terminalia arjuna</i>	Arjun
10.	<i>Sterculia guttata</i>	Bekro	24.	<i>Dalbergia latifolia</i>	Sissum
11.	<i>Pterocarpus marsupium</i>	Asan	25.	<i>Radermachera xylocarpa</i>	Kharsang
12.	<i>Mammea suriga</i>	Suranga	26.	<i>Samanea saman</i>	Rain tree
13.	<i>Lagerstroemia speciosa</i>	Taman	27.	<i>Terminalia catappa</i>	Badam
14.	<i>Syzygium caryophyllatum</i>	Bhedus	28.	<i>Pongamia pinnata</i>	Karanj

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 26 Detail of APO activities in Cotigao Wildlife Sanctuary**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1.	Raising of Seedlings in 5x8 polybags for plantation on Govt/Private organisation, Land and Public distribution.	50000 Nos.	Carried out
2.	Raising of seedlings in 6x10 polybags for CA plantation at Edda Patrolling Camp	50000 Nos.	Carried out
3.	Maintenance of 1 Year Old ANR plantation at Kadamaddi Nadke beat	5 Ha	Carried out
4.	Maintenance of 2-Year-Old CA plantation at Kosmakade Kuske beat	3 Ha	Carried out
5.	Maintenance of 2-Year-Old CA plantation at Nanyeholi Edda beat	3 Ha	Carried out
6.	Maintenance of 1 year old ANR and Gap Plantation at Endrem beat	5 Ha	Carried out
7.	Creation of Grass plot at Taleshet-Zambolim beat	1 Ha	Carried out
8.	Creation of Grass plot at Rumadshet-Bhutpal beat	1 Ha	Carried out
9.	Creation of Grass plot at Kumaramol-Tirwal beat	1 Ha	Carried out
10.	Maintenance of 1 Year Old CA plantation at Fondsolem-Tirwal	7 Ha	Carried out
11.	Maintenance of 1 Year Old CA plantation at Bhatfond-Tirwal	3 Ha	Carried out
12.	Maintenance of 1 Year Old CA plantation at Khargal-Tirwal	7 Ha	Carried out
13.	Eradication of Eupatorium weeds at Nadke beat	5 Ha	Carried out
14.	Eradication of Eupatorium weeds at Edda beat	5 Ha	Carried out
15.	Eradication of Eupatorium weeds at Voili Tirwal beat	5 Ha	Carried out
16.	Eradication of Eupatorium weeds at Bhutpal beat	5 Ha	Carried out
17.	Eradication of Eupatorium weeds at Khargal Tirwal beat	5 Ha	Carried out
18.	Chain link Fencing using RCC Poles for 5 Ha CA Plantation at Khalchi-Tirwal	5 Ha	Carried out
19.	Repairs and maintenance of the road from Edda to Ambeudak in Nadke Beat, CWLS	2 Kms	Carried out
20.	Desilting of the water hole and repairs to seasonal bandhara at BondkeChakut	-	Carried out
21.	Desilting of the water hole and repairs to seasonal bandhara at Kasarawati	-	Carried out
22.	Desilting of the water hole and repairs to seasonal bandhara at Barga	-	Carried out
23.	Desilting of the water hole and repairs to seasonal	-	Carried out

	bandhara at Dhantali-Endrem		
24.	Desilting of the water hole and repairs to seasonal bandhara at Ambeudak-II Nadke	-	Carried out
25.	Desilting of the water hole and repairs to seasonal bandhara at KegdiTaliNadke	-	Carried out
26.	Desilting of the water hole and repairs to seasonal bandhara at Dhantali-II Endrem	-	Carried out
27.	Desilting of the water hole and repairs to seasonal bandhara at Ambeudak - I	-	Carried out
28.	Desilting of the water hole and repairs to seasonal bandhara at Wagafond	-	Carried out
29.	Desilting of the water hole and repairs to seasonal bandhara at Ambyakade-I	-	Carried out
30.	Desilting of the water hole and repairs to seasonal bandhara at Ambyakade-II	-	Carried out
31.	Desilting of the water hole and repairs to seasonal bandhara at Fondsorem	-	Carried out
32.	Desilting of the water hole and repairs to seasonal bandhara at Khargal-II	-	Carried out
33.	Desilting of the water hole and repairs to seasonal bandhara at VoiliTirwal	-	Carried out
34.	Desilting of the water hole and repairs to seasonal bandhara at BitkeTirwal	-	Carried out
35.	Desilting of the water hole and repairs to Vasantbandhara at Zambolim	-	Carried out
36.	Desilting of the water hole and repairs to seasonal bandhara at Fatargal-Bhutpal	-	Carried out
37.	Desilting of the water hole and repairs to seasonal bandhara at Tulshimol	-	Carried out
38.	Desilting of the water hole and repairs to Vasantbandhara at Tree-top Bhutpal	-	Carried out
39.	Desilting of the water hole and repairs to Vasantbandhara at Devlamol-Zambolim	-	Carried out
40.	Desilting of water hole and repairs to Vasantbandhara at Perimol-Zambolim	-	Carried out
41.	Desilting of water hole and repairs to Vasantbandhara at Taleshet-Zambolim	-	Carried out
42.	Clearing of Fireline from Pimlamol to Pimplamol teak Plantation in Edda beat	-	Carried out
43.	Repairs and Maintenance of Road from Astragal check Post to Bhutpal Patrolling Station in Bhutpal Beat	2 Kms	Carried out
44.	Maintenance of View line from Hedumol to Tirwal Village in Tirwal beat	3.5 Kms	Carried out
45.	Providing and Fixing of Signage Arc at Eco-tourism	-	Carried out



	Complex at Hatipaul		
46.	Repairs of Staff Quarters in Tirwal beat	2 Nos.	Carried out
47.	Repairs of A & B type Staff Quarters at E.T.Complex Hatipaul	1 Nos.	Carried out
48.	Supply of Wooden Finish R.C.C Benches at Cotigao WLS	-	Carried out
49.	Clearing fire line around Eco-tourism complex at Hatipaul CWLS	5 Kms	Carried out
50.	Clearing fire line around Voilitirwal cashew plantation CWLS	2 Kms	Carried out
51.	Clearing fire line from Bodker to Tirwal village to Khalchitirwal CWLS	2 Kms	Carried out
52.	Clearing fire line from Voilitirwalbodker to Harvatem teak plantation CWLS	1 Kms	Carried out
53.	Clearing fire line from Fondsorem to smoke house to Appya house in CWLS	1 Kms	Carried out
54.	Clearing fire line from Shisheval to Khargal chain barrier in CWLS	1 Kms	Carried out
55.	Clearing fire line from Hedumol to Shishevol in CWLS	1 Kms	Carried out
56.	Clearing fire line from Edda patrolling station to Khadiyepan to Endrem CWLS	2 Kms	Carried out
57.	Clearing fire line around Khalchitirwal cashew plantation CWLS	5 Kms	Carried out
58.	Supply of signage board M.S frame of size 6 ft by 3 ft printed material on Eco vinyl using ACP sheet with MS pole and ACP board with vinyl print	-	Carried out
59.	Providing and fixing informative boards on steel frames of size 4x3 inch with printed material on eco vinyl sheet using ACP sheet for Nature Trail, Edda patrolling station, Endrem Beat	3 Nos.	Carried out





**Signage work at Cotigao Wildlife Sanctuary**



**Raised seedlings for CA plantation**



**De silting of water hole at Tirwal**



**Maintenance of Road from Astragal check Post to Bhutpal Patrolling Station**



**ANR plantation raised at Endrem Beat,**



**Supply of RCC benches at Endrem beat**

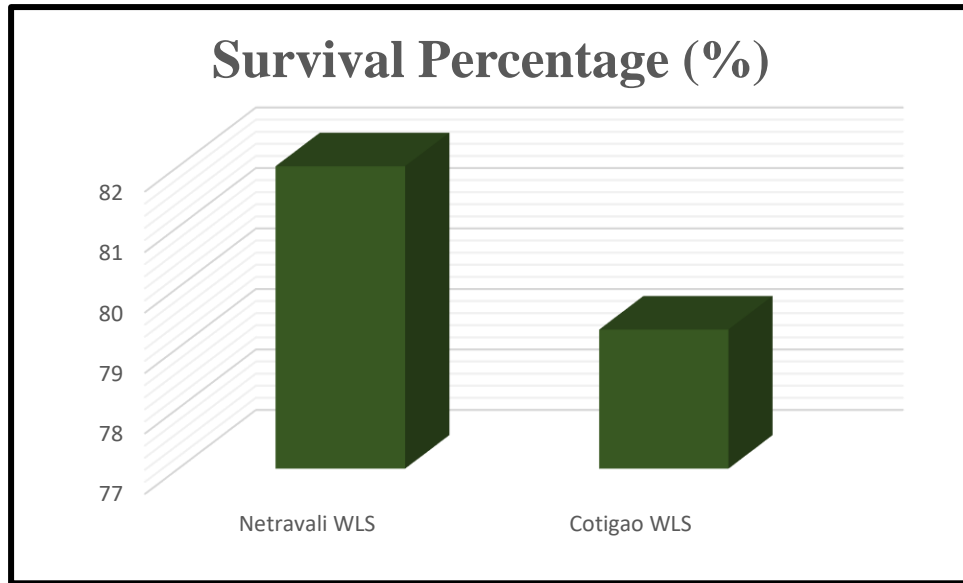


Figure 2: Bar graph illustrating the survival percentage of species across different forest ranges under South Goa Wildlife ranges.

In the South Goa Wildlife & Ecotourism Division, 30 hectares of plantations were established in Netravali and Cotigao. The survival rate of plants in this division varied from 79.3% to 82%, resulting in an average survival rate of 80.65%, indicating optimal conditions or management practices.

## 5.0 Field observation in North Goa- Territorial Division

In the North Goa Territorial Division, major activities carried out under CAMPA during the years 2022-23 were in Kerim Range, Ponda Range, Collem Range, Volpoi Range and Pernem Range. The plantations and the APOs were evaluated for the performance of the plantations and the execution of APO activities.

**Table Nos. 27 Compensatory Afforestation (CA) plantations in North Goa Territorial Division**

Name of the Range	Area
Keri Range	21 Ha
Ponda Range	16 Ha
Volpoi Range	155 Ha
Pernem Range	7 Ha
Total	199 Ha

**Table Nos. 28 Annual Plan of Operations in North Goa Territorial Division**

Name of the Range	Nature of APO activities	Quantity/ Area
Kerim Range	Raising of new CA plantations	21 Ha
Ponda Range	Maintenance of Plantation	25 Ha
	Providing protective fencing for CA Plantation	8 Ha and 0.806 Ha
	<b>Nursery Management and seeding raising</b>	
	Maintenance of seedling	50000 Nos.
	Raising of seedling	2,00,000 Nos.
	<b>Management of biodiversity and biological resources</b>	
	Creation of nature trail	3 Nos.
	<b>Forest protection</b>	
	Deployment of Fire tracker	3 Nos.
Collem Range	Maintenance of 1-year-old mixed species plantation	65 Ha
	Maintenance of 2-year-old mixed species plantation	24 Ha
	Maintenance of 3-year-old mixed species plantation	6.5 Ha

	<b>Nursery Management and seeding raising</b>	
	Maintenance of seedlings	2,25,000 Nos.
	Raising of seedlings	1,75,000 Nos.
	<b>Management of biodiversity and biological resources</b>	
	Clearance of view line	6 R/km
	<b>Soil and Moisture conservation work in the forest</b>	
	Construction of brushwood check dam at Forest Nursery	1Nos.
	Desilting of nallah with removal of debris at Bio Diversity Park	1Nos.
	<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
	Design construction and form work for butterfly park logo at Bio Diversity Park, Mollem	1Nos.
	Supply of Larva Host Plant, Orchids Flowering nectar plant for butterfly park at Bio Diversity Park, Mollem	1Nos.
	Supply of Common Tiger Metal Mural at Butterfly Park in Bio Diversity	1Nos.
	Supply of Butterfly Life cycle fibre mural at Butterfly Park in Bio Diversity Park, Mollem	1Nos.
	Construction of 33 mtr. retaining cum parapet wall in butterfly section of Bio Diversity Park, Mollem	1Nos.
	Construction of retaining wall near Amphi Theatre at Bio Diversity Park, Mollem.	1Nos.
	Raising of lawn Perspalum grass in tree stand in area of at Bi Diversity Park, Mollem village.	110 m <sup>2</sup>
	Construction of retaining wall near Zipline at Bio Diversity Park, Mollem.	1Nos.
	Logo Mark for Bio Diversity Park, Mollem	1Nos.
	Supply of fabrication and fixing display, signage information boards for butterfly park at Bio Diversity	1Nos.

	Park, Mollem	
	Construction of water pond and cutter in Bio Diversity Park, Mollem village	1Nos.
	Supply and fixing of 3 HP pump for Bore well at Bio Diversity Park, Mollem	1Nos.
	Digging of Borewell in Bio Diversity Park, Mollem	1 Nos.
Valpoi Range	Maintenance of 2-year-old mixed species plantation	20 Ha
	<b>Nursery Management and seeding raising</b>	
	Raising of seedlings (5x8 size polybags) for public distribution	50000 Nos.
	<b>Management of biodiversity and biological resources</b>	
	Creation of nature trail	1Nos.
	<b>Forest protection</b>	
	Providing Protective Chain link fencing in plantations	6123 R/Km
Pernem Range	<b>Nursery Management and seeding raising</b>	
	Raising of Miscellaneous seedlings at Forest Colony, Tuem Nursery	50000 Nos.
	<b>Forest Fire prevention and control operation</b>	
	Chain link fencing using RCC Poles	21 Ha

## 1. Keri Range

### Information about CA plantations under CAMPA 2022-23 in Keri Range

The total area of the plantation under CAMPA 2022-23 in the Keri range is 21 Ha. The major locations of the plantation area and its details are given below.

**Table Nos. 29 Details of CA plantations established in Keri Range**

Sl. No	Location of the plantations	Area	Survival %	Remarks
1.	CA plantation at Morlem village, Part-III	6 Ha	80%	Planted and performing well.
2.	CA plantation at Morlem village, Part-III (A)	4 Ha	85%	Planted and performing well.
3.	CA plantation at Morlem village, Part-II	7 Ha	78%	Planted and performing well.
4.	CA plantation at Morlem village, Part-II (A)	4 Ha	82%	Planted and performing well.

### Observations

A total of 21 Ha is planted in the Keri range under CAMPA 2022-23. Fruit bearing and indigenous plants have been carefully selected as planting stocks in all locations. About 20 different species of fruit bearing and wildlife important plants have been planted. For the good growth of seedlings proper weeding is required. The survival percentage varied from 78 to 85% and the overall survival percentage in this range was 81.25%.

**Table Nos. 30 List of major species planted in Keri Range**







Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Tamarindus indica</i>	Chinch	1	<i>Mimusops elengi</i>	Owal
2.	<i>Emblia officinalis</i>	Awala	2	<i>Sapindus emarginatus</i>	Rito
3.	<i>Eugenia jambolana</i>	Jambal	3	<i>Lagerstroemia speciosa</i>	Taman
4.	<i>Syzygium aqueum</i>	Jam	4	<i>Vateria indica</i>	Dhoop
5.	<i>Ziziphus mauritiana</i>	Bora	5	<i>Garcinia indica</i>	Bhiran
6.	<i>Terminalia catappa</i>	Badam	6	<i>Sweitenia macrophylla</i>	Mahagony
7.	<i>Mangifera indica</i>	Mango	7	<i>Dalbergia latifolia</i>	Sisam
8.	<i>Gmelina arborea</i>	Shivon	8	<i>Psidium guajava</i>	Peru
9.	<i>Cassia fistula</i>	Bayo	9	<i>Bambusa bamboos</i>	Bamboo
10.	<i>Terminalia bellirica</i>	Ghotting	10	<i>Tectona grandis</i>	Teak

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 31 Details of APOs carried out in Keri Range**

<b>Sl. No</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1.	Raising of New CA Plantation under Sy. Nos. 56/0 at Morlem Plantation Part III Spacement (3m x 3m) for 6 Ha (1111 sapling/Ha)	6 Ha	Carried out and maintained well
2.	Raising of New CA Plantation under Sy. Nos. 56/0 at Morlem Plantation Part III (A) Spacement (3m x 3m) for 4 Ha (1111 sapling/Ha)	4 Ha	Carried out and maintained well
3.	Raising of New CA Plantation under Sy. Nos. 56/0 at Morlem Plantation Part II Spacement (3m x 3m) for 7 Ha (1111 sapling/Ha)	7 Ha	Carried out and maintained well
4.	Raising of New CA Plantation under Sy. Nos. 56/0 at Morlem Plantation Part II (A) Spacement (3m x 3m) for 4	4 Ha	Carried out and maintained well



	
<p><b>CA plantation at Morlem village, Part-III</b></p>	<p><b>Seedlings growing well at mix-native species plantation at, Morlem Beat</b></p>
	
<p><b>CA plantation at Morlem village, Part-II</b></p>	<p><b>Bhedas seedling well grown at Morlem Beat, mixed-native species plantation</b></p>
	
<p><b>CA plantation at Morlem village, Part-I</b></p>	<p><b>Damaged Jack seedling in Morlem Beat plantation</b></p>



## 2. Ponda Range

### Information about CA plantations under CAMPA 2022-23 in Ponda Range

Total area of plantation under CAMPA 2022-23 in Ponda range is 30 Ha. The major locations of the plantation area and its details are given below.

**Table Nos. 32 Details of CA and ANR plantations established in Ponda Range**

Sl. Nos.	Location of the plantation	Area	Survival %	Remarks
1.	CA Plantation at Nirankal Part-I	5 Ha	78%	Carried out and in good condition
2.	CA Plantation at Nirankal Part-II	5 Ha	80%	Carried out and in good condition
3.	ANR plantation at Paz	6.5 Ha	68%	Carried out and in good condition
4.	ANR plantation at Paz	3.5 Ha	65%	Carried out and in good condition
5.	ANR plantation at Queula	4.5 Ha	72%	Carried out and in good condition
6.	ANR plantation at Nirankal	5 Ha	70%	Carried out and in good condition
7.	ANR plantation at Priol	5 Ha	66%	Carried out and in good condition
8.	ANR plantation at Borim	5.5 Ha	68%	Carried out and in good condition

### Observations

A total of 30 Ha is planted in the Ponda range under CAMPA 2022-23. All plantations had mixed fruit trees and were performing well. About 20 different species of fruit bearing and wildlife-important plants were planted. The survival percentage varied from 65-80% and the average survival percentage in this range was 70.8%. The growth of plantation was affected due to several factors like viz. invasion of weeds, inhibition of initial growth of young seedlings by leaf litters from surrounding trees and additionally the plantation faced grazing challenges from wild animals and domestic animals belonging to local community.

**Table Nos. 33 List of major species planted in Ponda Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Cane spp.</i>	Canes	11.	<i>Emblica officinalis</i>	Awla
2.	<i>Syzygium cumini</i>	Jambal	12.	<i>Tamarindus indica</i>	Chinch
3.	<i>Vateria indica</i>	Dhoop	13.	<i>Mangifera indica</i>	Mango
4.	<i>Artocarpus integrifolia</i>	Jackfruit	14.	<i>Annona squamosa</i>	Sitafal
5.	<i>Pterocarpus marsupium</i>	Assan	15.	<i>Ziziphus jujuba</i>	Bor
6.	<i>Terminalia catappa</i>	Badam	16.	<i>Terminalia Bellirica</i>	Ghoting
7.	<i>Terminalia tomentosa</i>	Matti	17.	<i>Garcinia indica</i>	Bhiran
8.	<i>Lagerstroemia lanceolata</i>	Nano	18.	<i>Calophyllum inophyllum</i>	Undi
9.	<i>Sweitenia mahagony</i>	Mahagony	19.	<i>Vateria indica</i>	Tirfal
10.	<i>Dalbergia sissoo</i>	Sisum	20.	<i>Mimusops elengi</i>	Oval

**Information about other CAMPA activities as per APO and its details****Table Nos. 34 Details of APOs carried out in Ponda Range**

Sl. Nos.	Name of the work	Quantity	Remarks
1.	Providing protective fencing for new raised CA Plantation at Nirankal	8 Ha	Carried out
2.	3rd year maintenance of 2-year-old CA Plantation with Protective Fencing at Shiroda	5 Ha	Carried out
3.	2nd year maintenance of 1-year-old CA Plantation with Protective Fencing at Shiroda	5 Ha	Carried out
4.	2nd year maintenance of 01 yr old CA Plantation with Protective Fencing under Sy. Nos. of village Spacement (3m x 3m) for (1000 Saplings / Ha), 20% Casualty replacement.at Nirankal	5 Ha	Carried out
5.	Providing protective fencing for new raised CA Plantation at Nirankal	8 Ha	Carried out
6.	Protection of the CA Plantation, 6 yrs old, 0.806 Ha from Forest Fires at Shiroda	0.806 Ha	Carried out
7.	3rd year maitenance of 2-year-old CA plantation with Protective Fencing at Conquirem	0.900 R/Km	Carried out
8.	Raising of. miscellaneous seedlings 5' x 8' size (Public distribution) at Usgao	50000 Nos	Carried out

9.	Raising of miscellaneous seedlings 8" x 12" size (Compensatory, Afforestation Plantation) at Usgao	25000 Nos.	Carried out
10.	Raising of miscellaneous seedlings (Mixed species) 5" x 8" size at for public distribution, (Compensatory Afforestation Plantation) at Usgao	34000 Nos.	Carried out
11.	Raising of miscellaneous seedlings (Mixed species & fruit bearing) 5" x 8" size at for plantations. (Compensatory Afforestation Plantation) at Usgao	66000 Nos.	Carried out
12.	Raising of miscellaneous seedlings (Mixed species) 5" x 8" size for public distribution) Compensatory Afforestation Plantation) at Usgao	25000 Nos.	Carried out
13.	Maintenance of miscellaneous seedlings in 5' x 8' at Tisk Usgao Nursery for CA Plantation	50000 Nos.	Carried out
14.	The material supply for raising of 34,000 Nos. Mixed species for public distribution at Tisk Usgao Nursery	-	Carried out
15.	The material supply for raising of 60,000 Nos. Polybag Size at Tisk Usgao Nursery	-	Carried out
16.	2nd year maintenance of 1-year-old CA plantation with Protective Fencing at Queula	5 Ha	Carried out
17.	Organization of Nature Trail / Bird Walk into Forest areas within Ponda Range Jurisdiction areas Pilliem, Mardangad and Siddanath)	3 Nos.	Carried out
18.	Engagement of Fire Watchers for prevention of Forest Fire under Shiroda Round in Ponda Range.	-	Carried out
19.	Engagement of Fire Watchers for prevention of Forest Fire under Usgao Round in Ponda Range.	-	Carried out
20.	Engagement of Fire Watchers for prevention of Forest Fire under Ponda Round in Ponda Range.	-	Carried out





**Physical assessment of raised seedlings at Usgao nursery**



**CA plantation at Nirankal beat**



**Growth observation taken on Mango seedlings at Nirankal**



**Jack seedling well grown at Queula Beat, mixed native species plantation**



**ANR plantation at Paz**



**Maintenance of CA plantation at Nirankal**

### 3. Collem Range

The total area of the CA plantation under maintenance in CAMPA 2022-23 in Collem range is 90.5 Ha. The major locations of the plantation area and its details are given below.

**Table Nos. 35 Details of maintenance of plantations established in Collem Range**

Sl.No	Location of the planation	Area	Survival %	Remarks
1.	Collem Beat	10 Ha.	66%	Maintained and good in condition
2.	Aglote Beat	20 Ha.	77%	Maintained and good in condition
3.	Sacorda Beat	15 Ha	75%	Maintained and good in condition
4.	Sukolim Beat (North)	24 Ha.	72%	Maintained and good in condition
5.	Mollem (North) Beat	6.5 Ha.	80%	Maintained and good in condition
6.	Bhindimol Beat	5 Ha.	72%	Maintained and good in condition
7.	Talsai Beat	5 Ha.	68%	Maintained and good in condition
8.	Costi Beat	5 Ha.	77%	Maintained and good in condition

#### Observations

A total of 90.5 Ha areas of the plantations were under maintenance in the range and it is dominated by fruit-producing trees that were well maintained. The survival percentage varied from 66 to 80%. About 36 different species were planted in the plantations. The average survival percentage in this range was 73.3%

**Table Nos. 36 List of major species planted in Collem Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1.	<i>Terminalia paniculata</i>	Kindal	19.	<i>Sapindus trifoliatus</i>	Rito
2.	<i>Terminalia tomentosa</i>	Matti	20.	<i>Garcinia indica</i>	Bhirand
3.	<i>Terminalia bellirica</i>	Ghoting	21.	<i>Vateria indica</i>	Dhoop

4.	<i>Mangifera indica</i>	Mango	22.	<i>Ziziphus jujuba</i>	Bor
5.	<i>Syzygium cumini</i>	Jambal	23.	<i>Ficus glomerata</i>	Khair
6.	<i>Emblica officinalis</i>	Awali	24.	<i>Thespesia populnea</i>	Bhendi
7.	<i>Artocarpus integrifolia</i>	Jack Fruit	25.	<i>Holoptelea integrifolia</i>	Vavlo
8.	<i>Tamarindus indica</i>	Chinch	26.	<i>Limonia acidissima</i>	Applewood
9.	<i>Psidium guajava</i>	Peru	27.	<i>Zanthoxylum brachyacanthum</i>	Thornywood
10.	<i>Zanthoxylum rhetsa</i>	Trifal	28.	<i>Neolamarckia cadamba</i>	Kadamb
11.	<i>Lagerstroemia lanceolata</i>	Nano	29.	<i>Bauhinia racemosa</i>	Apto
12.	<i>Dalbergia latifolia</i>	Sissum	30.	<i>Caesalpinia pulcherrima</i>	Kesari
13.	<i>Artocarpus lakucha</i>	Ottam	31.	<i>Ficus benghalensis</i>	Vad
14.	<i>Gmelina arborea</i>	Shivan	32.	<i>Butea monospema</i>	Palas
15.	<i>Alstonia scholaris</i>	Saton	33.	<i>Ficus religiosa</i>	Pimpal
16.	<i>Albizia lebbek</i>	Sirus	34.	<i>Sterculia urens</i>	Arjun
17.	<i>Cassia fistula</i>	Bayo	35.	<i>Pterocarpus marsupium</i>	Hassan
18.	<i>Bauhinia racemosa</i>	Apto	36.	<i>Mimusops elengi</i>	Oval

#### Information about other CAMPA activities as per APO and its details

**Table Nos. 37 Details of APOs carried out in Collem Range**

Sl. No	Name of the work	Quantity	Remarks
1.	Maintenance of 1 year old mix spec-ies CA plantation under Sy. Nos. 34 at Zamblimol Collem P-I	5 Ha.	Maintained well.
2.	Maintenance of 1 year old mix species CA plantation under Sy. Nos. 34 at Zamblimol Collem P-II	5 Ha.	Maintained well.
3.	Maintenance of 1 year old mix species CA plantation at Sangod Village under Sy. Nos. 27 – (P-I)	5 Ha.	Maintained well.
4.	Maintenance of 1 Year old mix CA plantation under Sy. Nos. 15 at Sangod village	5 Ha.	Maintained well.
5.	Maintenance of 1 Year old mixed CA plantation under Sy. Nos. 27 at Sangod Village – P-II	5 Ha.	Maintained well.
6.	Maintenance of 2-year-old mixed fruit bearing CA plantation under Sy. Nos. 15 at Sangod village	4 Ha.	Maintained well.
7.	Maintenance of 2-Year-old mixed CA plantation under Sy. Nos. 15 of Sangod village	5 Ha.	Maintained well.
8.	Maintenance of 3-year-old CA plantation under Sy. Nos.	6.5 Ha.	Maintained



	16 of Mollem village		well.
9.	Maintenance of 1 year old mixed CA plantation at Costi under Sy. Nos. 48	5 Ha.	Maintained well.
10.	Maintenance of 1 year old mix species CA plantation at Bhindimol Kalay Sy. Nos. 17	5 Ha.	Maintained well.
11.	Maintenance of 1 Year old mix CA Plantation under Sy. Nos. 13 at Aglote village	5 Ha.	Maintained well.
12.	Maintenance of 1 year old CA plantation under Sy. Nos. 13 at Kesargal Aglote- P-II	5 Ha.	Maintained well.
13.	Maintenance of 1 Year old mix CA plantation under Sy. Nos. 13 at Kasargal Aglote – P-I	5 Ha.	Maintained well.
14.	Maintenance of 1 year old mixed CA plantation under Sy. Nos. 11 at Satpal Sacorda	5 Ha.	Maintained well.
15.	Maintenance of 1 Year old mix CA plantation under Sy. Nos. 11 at Dongarwada Sancorda village	5 Ha.	Maintained well.
16.	Maintenance of 2-Year-old mix CA plantation under Sy. Nos. 13 at Kasargal Aglote	2 Ha.	Maintained well.
17.	Maintenance of 2-Year-old mixed cA plantation under Sy. Nos. 13 at Aglote village	3 Ha.	Maintained well.
18.	Maintenance of 2-Year-old mixed species CA plantation at Satpal Sacorda under Sy. Nos.	5 Ha.	Maintained well.
19.	Maintenance of 2-Year-old mixed CA plantation under Sy. Nos. 93 at Talsai Dharbandora	5 Ha.	Maintained well.
20.	Raising of 25000 Nos. of mix polybags seedlings of size 5 x 8 at Dharbandora Forest Nursery	25000 Nos.	Carried out
21.	Maintenance of one year old 225000 Nos. mix polybags seedlings 5x8 size at Dharbandora Forest Nursery	225000 Nos.	Maintained well.
22.	Raising of 25000 Nos. of mix polybags seedlings of Size 5 x 8 at Dharbandora Forest Nursery	25000 Nos.	Carried out
23.	Raising of 25000 Nos. of mix polybags seedlings of Size 5 x 8 at Dharbandora Forest Nursery	25000 Nos.	Carried out
24.	Raising of 20000 Nos. of mix polybags seedlings of Size 5 x 8 at Dharbandora Forest Nursery	20000 Nos.	Carried out
25.	Raising of 40000 Nos. of mix polybags seedlings of Size 5 x 8 at Dharbandora Forest Nursery	40000 Nos.	Carried out
26.	Raising of 40000 Nos. of mix polybags seedlings of Size 5 x 8 at Dharbandora Forest Nursery	40000 Nos.	Carried out
27.	Clearance of view line at both side of Nature Trail under Sy. Nos. 16 of Mollem village of Bio Diversity Park, Mollem.	6 R/km.	Carried out
28.	Raising of Lown plot Mexilown grass within an area 110 Sq. mtrs. In front of park office/labour room/store room building at Bio Diversity Park, Mollem.	-	Carried out
29.	Design construction and form work for butterfly park logo at Bio Diversity Park, Mollem.	-	Carried out

30.	Beautification of Existing path within Butterfly Garden by fixing patradevi stone at Bio Diversity Park, Mollem	-	Carried out
31.	Construction of 33 mtr. retaining cum parapet wall in butterfly section of Bio Diversity Park, Mollem	-	Carried out
32.	Supply of Larva Host Plant, Orchids Flowering nectar plant for butterfly park at Bio Diversity Park, Mollem	-	Carried out
33.	Supply of Common Tiger Metal Mural at Butterfly Park in Bio Diversity	-	Carried out
34.	Supply of Butterfly Life cycle fibre mural at Butterfly Park in Bio Diversity Park, Mollem	-	Carried out
35.	Supply f Graphical Butterfly Metal Mural at Bio Diversity Park, Mollem	-	Carried out
36.	Providing work of Earthwork excavation laterite masonry plastering and construction of cafeteria at Bio Diversity Park, Mollem	-	Carried out
37.	Providing work of flooring painting and steel work for construction of cafeteria in Bio Diversity Park, Mollem	-	Carried out
38.	Providing fancy roofing PVC sheet to outside canteen sit out in Bio Diversity Park, Mollem	-	Carried out
39.	Providing Steelwork for roofing & woodwork for construction of outside canteen sit out in Bio Diversity Park in Mollem village	-	Carried out
40.	Construction of outside canteen sit out in Bio Diversity Park, Mollem village	-	Carried out
41.	Providing work of Earthwork excavation and laterite masonry for construction of outside canteen sit out in Bio Diversity Park, Mollem	-	Carried out
42.	Design profile, cutting fabrication fitting welding and assembling, primer coating and painting (03 coat) of butterfly shaped design chair for butterfly park at Bio Diversity Park, Mollem.	-	Carried out
43.	Design profile, cutting fabrication, fitting, welding and assembly, primer coating and painting (03 coats) of Butterfly shaped selfie point for Butterfly Park at Bio Diversity Park, Mollem.	-	Carried out
44.	Design, profile cutting fabrication, fitting welding and assembly, primer coating and painting (03 coats) of Butterfly shaped butterfly design kids chair for butterfly park at Bio Diversity Park, Mollem.	-	Carried out
45.	Supply of fabrication and fixing display, signage information boards for butterfly park at Bio Diversity Park, Mollem	-	Carried out
46.	Provision of Barbed wire fencing for protection of Bio Diversity Park, Mollem	80 m	Carried out
47.	Procurement of 5 HP submersible water pump and Electrical fitting for irrigation network system at Bio Diversity Park, Mollem	-	Carried out
48.	Procurement of maxi lawn for planting within the existing path for beautification of butterfly Garden at Bio	-	Carried out



	Diversity Park, Mollem.		
49.	Design casting construction and installation of mural and butterfly shape on already casted entry gate of butterfly park at Bio Diversity Park, Mollem	-	Carried out
50.	Construction of retaining wall near Zipline in Bio Diversity Park, Mollem.	-	Carried out
51.	Construction of retaining wall near Amphi-theatre in Bio Diversity Park, Mollem	-	Carried out
52.	Providing work of laterite and PVC false ceiling of internal Room of cafeteria in Bio Diversity Park, Mollem.	-	Carried out
53.	Providing flooring work of cafeteria in Bio Diversity Park, Mollem	-	Carried out
54.	Construction of water pond and cutter in Bio Diversity Park, Mollem village	-	Carried out
55.	Supply and fixing of 3 HP pump for Bore well at Bio Diversity Park, Mollem	-	Carried out
56.	Digging of Borewell in Bio Diversity Park, Mollem	-	Carried out
57.	Providing Top canopy to slider in Butterfly Park in Bio Diversity Park, Mollem	-	Carried out



**Verification of flooring and steel work inside canteen at Biodiversity Park**



**Quadrates selection for survival assessment of plantations in Range at Sancod**



**Forest officials briefing about the plantation and seedling casualties due to grazing by wild animals at Costi Village**



**Evaluation team visits Dharbandora Nursery**



**Physical evaluation of Canteen works in Bio Diversity Park**



**Well maintained CA plantation at Sacorda**

#### 4. Valpoi Range

##### Information about ANR plantations under CAMPA 2022-23 in Valpoi Range

The total area of plantation under CAMPA 2022-23 in Valpoi range is 165 Ha. The locations of the plantation area and its details are given below.

**Table Nos. 38 Details of ANR plantations established in Valpoi Range**

Sl.No	Location of the plantation	Area	Survival %	Remarks
1	CA Melauli Beat	38 Ha.	86%	Completed and good in condition
2	CA Nagvem Beat	20 Ha.	82%	Completed and good in condition
3	CA Cumarkhand Beat	25 Ha	84%	Completed and good in condition
4	CA Naneli Beat	11 Ha.	82%	Completed and good in condition
5	CA Bhuipal Beat	40 Ha.	78%	Completed and good in condition
6	CA Bhuipal and Cumarkhand Beat	9 Ha.	72%	Completed and good in condition
7	CA Malpan Beat	12 Ha.	92%	Completed and good in condition
8	ANR Ansolem Beat	5 Ha.	65%	Completed and good in condition
9	ANR Ustem Beat	5 Ha.	82%	Completed and good in condition

##### Observations

A total of 165 Ha is planted in the Valpoi range under CAMPA 2022-23. About 34 different species including fruit-bearing trees were planted in Ansolem and Malpan. In Valpoi, canes plantation is maintained. All the plantations were performing well and the survival percentage in different plantations varied from 72 to 92%, with an average survival percentage of 84.6% in the range and wildlife significance have been planted.

**Table Nos. 39 List of major species planted in Valpoi Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1	<i>Canes Spp.</i>	Canes	18	<i>Terminalia tomentosa</i>	Matti
2	<i>Ficus benghalensis</i>	Vad	19	<i>Cassia fistula</i>	Bayo
3	<i>Ficus religiosa</i>	Pimpal	20	<i>Vateria indica</i>	Dhoop
4	<i>Psidium guajava</i>	Peru	21	<i>Bauhinia racemosa</i>	Apto
5	<i>Anacardium occidentale</i>	Cashew	22	<i>Aegle marmelos</i>	Bel
6	<i>Tamarindus indica</i>	Chinch	23	<i>Terminalia arjuna</i>	Arjun
7	<i>Terminalia catappa</i>	Badam	24	<i>Albizia lebbek</i>	Sirus
8	<i>Artocarpus integrifolia</i>	Jack Fruit	25	<i>Acacia catechu</i>	Khair
9	<i>Emblica officinalis</i>	Awali	26	<i>Tectona grandis</i>	Teak
10	<i>Syzygium cumini</i>	Jambal	27	<i>Dalbergia latifolia</i>	Sissum
11	<i>Sapindus laurifolius</i>	Rito	28	<i>Artocarpus lacucha</i>	Ottam
12	<i>Sweitenia mahagony</i>	Mahaguni	29	<i>Mimusops elengi</i>	Oval
13	<i>Garcinia indica</i>	Bhidi	30	<i>Mangifera indica</i>	Mango
14	<i>Anthocephalus cadamba</i>	Kadam	31	<i>Butea monospema</i>	Palas
15	<i>Delonix regia</i>	Gulmohor	32	<i>Machilus macranthus</i>	Alam
16	<i>Terminalia bellirica</i>	Ghoting	33	<i>Bambusa bamboos</i>	Bamboo
17	<i>Ficus glomerata</i>	Rumod	34	<i>Samanea saman</i>	Raintree

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 40 Details of APOs carried out in Valpoi Range**

Sl. No	Name of the work	Quantity	Remarks
1	Maintenance of 2year old plantation forestry & Fruit bearing plantation Nagvem Phase-I Sy. Nos.8/1	5 Ha	Maintained well.
2	Maintenance of 2year old plantation forestry & Fruit bearing plantation Nagvem Phase-II Sy. Nos.8/1	5 Ha	Maintained well.
3	Maintenance of 2year old plantation forestry & Fruit bearing plantation Malpan Phase- I Sy. Nos.18 (P) & 24 (P)	5 Ha	Maintained well.
4	Maintenance of 2year old plantation forestry & Fruit bearing	5 Ha	Maintained

	plantation Malpan Phase- II Sy. Nos.18 (P) & 24 (P)		well.
5	Raising of Miscellaneous seedlings of 5x8 size (Public distribution) Nagvem Phase-I Sy. Nos.8/1	50000 Nos	Carried out
6	Providing Protective Chain link fencing in plantation at Melauli	376 R/mtr	Carried out
7	Providing Protective Chain link fencing in plantation at Melauli	376 R/mtr	Carried out
8	Providing Protective Chain link fencing in plantation at Melauli	376 R/mtr	Carried out
9	Providing Protective Chain link fencing in plantation at Melauli	333 R/mtr	Carried out
10	Providing Protective Chain link fencing in plantation at Melauli	333 R/mtr	Carried out
11	Providing Protective Chain link fencing in plantation at Melauli -II	333 R/mtr	Carried out
12	Providing Protective Chain link fencing in plantation at Nagvem-I	333 R/mtr	Carried out
13	Providing Protective Chain link fencing in plantation at Nagvem-II	333 R/mtr	Carried out
14	Providing Protective Chain link fencing in plantation at Nagvem-III	333 R/mtr	Carried out
15	Providing Protective Chain link fencing in plantation at Nagvem-IV	333 R/mtr	Carried out
16	Providing Protective Chain link fencing in plantation at Nagvem-V	333 R/mtr	Carried out
17	Providing Protective Chain link fencing in plantation at Nagvem-VI	333 R/mtr	Carried out
18	Providing Protective Chain link fencing in plantation at Nagvem-VII	333 R/mtr	Carried out
19	Providing Protective Chain link fencing in plantation at Nagvem-VIII	333 R/mtr	Carried out
20	Providing Protective Chain link fencing in plantation at Nagvem-IX	333 R/mtr	Carried out
21	Providing Protective Chain link fencing in plantation at Nagvem-X	333 R/mtr	Carried out
22	Providing Protective Chain link fencing in plantation at Nagvem-A	333 R/mtr	Carried out
23	Providing Protective Chain link fencing in plantation at Nagvem-B	333 R/mtr	Carried out





**Physical verification of protective chain-link Fencing at Nagvem**



**Discussion with forest officials about plantation at Melauli**



**Quadrat survey at Melauli**



**CA plantation evaluation at Zarme**



**ANR plantation maintenance in Ustem**



**CA plantation evaluation at Cumarkhand**



## 5. Pernem Range

In Pernem range, 15 Ha of plantation establishment was carried out during 2022-23. APO activities were also carried out. The details of the CA and ANR plantations activities carried out are given below.

**Table Nos. 41 Details of CA and ANR plantations established in Pernem Range**

Sl. No	Location of the planation	Area	Survival %	Remarks
1	CA plantation, Alorna Beat	7 Ha	88%	Carried out and in good condition
2	ANR plantation, Alorna Beat	4 Ha	78%	Carried out and in good condition
3	ANR plantation, Chandel Beat	4 Ha	80%	Carried out and in good condition

### Observations

A total of 15 Ha is planted in the Pernem range under CAMPA 2022-23. About 18 different species including fruit-bearing trees were planted in Alorna and Chandel. All the plantations were performing well and the survival percentage varied from 78 to 88%, with an average survival percentage of 82%

**Table Nos. 42 List of major species planted in Pernem Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1	<i>Mangifera indica</i>	Mango	10	<i>Lagerstroemia speciosa</i>	Taman
2	<i>Ficus benghalensis</i>	Vad	11	<i>Cassia fistula</i>	Bayo
3	<i>Ficus religiosa</i>	Pimpal	12	<i>Vateria indica</i>	Dhoop
4	<i>Psidium guajava</i>	Peru	13	<i>Bauhinia racemosa</i>	Apto
5	<i>Anacardium occidentale</i>	Cashew	14	<i>Garcinia indica</i>	Bhirand
6	<i>Tamarindus indica</i>	Chinch	15	<i>Gmelina arborea</i>	Shivan
7	<i>Eugenia jambolana</i>	Jam	16	<i>Albizia lebbeck</i>	Sirus
8	<i>Artocarpus integrifolia</i>	Jack Fruit	17	<i>Acacia catechu</i>	Khair
9	<i>Emblica officinalis</i>	Awali	18	<i>Terminalia bellirica</i>	Ghotting

**Table Nos. 43 Details of APOs carried out in Pernem Range**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1.	Raising of seedlings of 5x8 size polybags for public distribution & for plantation at Forest Colony, Tuem Nursery	50000 Nos.	Carried out
2.	Celebration of Vanmohstav by Panchyat Schools in the jruisdiction of Pernem Range	-	Carried out
3.	Engagement of Fire watcher at Alorna & Casarvarne	-	Carried out
4.	Chain link fencing using RCC Poles at 3.5 interval in Alorna Village at CA Planation	7 Ha	Carried out
5.	Chain link fencing 400 to 730 mtrs using RCC Poles at 3.5 interval in Alorna Village at CA Planation	7 Ha	Carried out
6.	Chain link fencing 730 to 1060 mtrs using RCC Poles at 3.5 interval in Alorna Village at CA Planation	7 Ha	Carried out





### Nursery at Forest colony, Tuem



## Chain-link fencing with RCC poles at CA plantation, Alorna



**Mango seedling well grown at  
ANR plantation, Alorna**



**Well grown Jack seedling at  
CA plantation, Alorna**



### Ghotting seedling well grown at CA plantation, Alorna



### Quadrat survey at CA plantation, Alorna beat

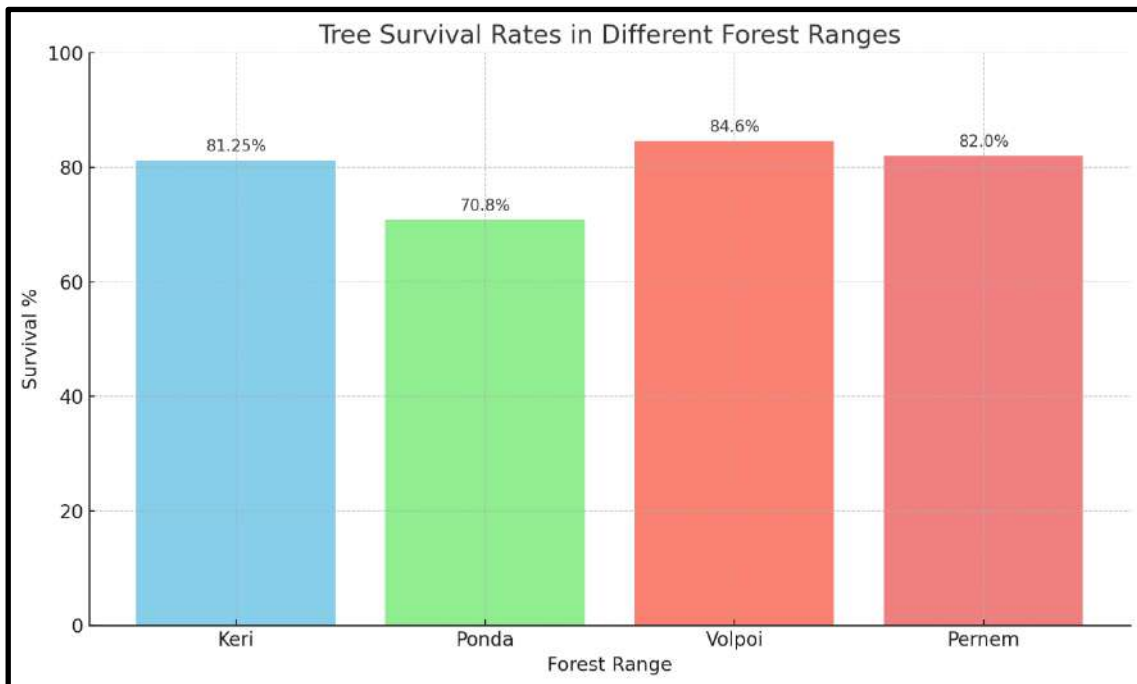


Figure 3: Bar graph illustrating the survival percentage of species across different forest ranges under North Goa Territorial ranges

It is encouraging to observe that all ranges have a survival rate above 70%, with Volpoi leading at 84.6%. This indicates successful efforts in these regions to maintain and protect tree populations. The overall high survival rates reflect positively on the environmental conservation measures in place.



## 6.0 Field observations in North Goa Wildlife & Ecotourism Division

In the North Goa Wildlife and Ecotourism Division, major activities carried out under CAMPA during the years 2022-23 were in Bhagwan Mahavir National Park and Wildlife Sanctuary (Mollem), Madhei Wildlife Sanctuary, Bondla Wildlife Sanctuary and Campal Wildlife Range. No plantation activities were carried out in this Division.

### Information about APO activities under CAMPA 2022-23 in North Goa Wildlife and Ecotourism Division

**Table Nos. 44 Details of APOs carried out in North Goa Wildlife and Ecotourism Division**

<b>Name of the Range</b>	<b>Nature of APO activities</b>	<b>Quantity</b>
Bhagwan Mahavir National Park and Wildlife Sanctuary (Mollem)	<b>Nursery Management and seeding raising</b>	
	Raising of seedlings	25000 Nos.
	<b>Forest protection</b>	
	Repairment of road from Ring road junction to Sunset Point	1 Nos.
	Maintenance of road from Sonaulim to Dudhsagar in BMWLS & NP	1 Nos.
	Maintenance of road from Shiregal to Sonaulim in BMWLS & NP	1 Nos.
	Maintenance of road from Collem entry gate to Bhindifator and Bhindifator to Shiregal in BMWLS & NP	1 Nos.
	<b>Wildlife and habitat improvement</b>	
	Eradication of Eupatorium & converting into compost by Burying	43 Ha
	<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
	Construction of labour shed at Mollem	1 Nos.
	Repair of roofing of A-type quarter	2 Nos.
Madhei Wildlife Sanctuary	<b>Nursery Management and seeding raising</b>	
	Raising of seedlings	25000 Nos.

	<b>Forest protection</b>	
	Repair of existing forest patrolling route	5 km
	<b>Soil and moisture conservation work in the forest</b>	
	Creation of water retention structure at Surla	1 Nos.
	<b>Wildlife and habitat improvement</b>	
	Construction of grass land	3 Nos.
	Removal of invasive species like Eupatorium, Ruthenium species	40 Ha
	<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
	Construction of Labour Shed	1 Nos.
	Maintenance of 'A' type quarter	1 Nos.
	<b>Wildlife and habitat improvement</b>	
	Eradication of eupatorium & converting into compost	20 Ha
	Restoration of Grassland	1 Ha
	Raising Canes Plantation	5 Ha
Bondla Wildlife Range	<b>Wildlife and habitat improvement</b>	
	Work of Raising Canes Plantation at Ganjem beat of Bondla Wildlife Sanctuary.	5.0 Ha
	Maintenance of Grassplot at Bondla wildlife Sanctuary.	1.5 Ha
	Maintenance of Grassplot at Deer safari at Bondla Wildlife Sanctuary.	1.0 Ha
	Restoration of Grassland habitat at Dharbandora beat of Bondla Wildlife Sanctuary	0.5 Ha
	Eradication of eupatorium & converting into compost by burning in Usgao beat of Bondla Wildlife Sanctuary.	20 Ha
	Restoration of Grassland habitat at Ganjem beat of Bondla Wildlife Sanctuary	0.5 Ha
Campal Wildlife Range.	<b>Nursery Management and seeding raising</b>	
	Raising of Nursery for public distribution	50,000 Nos.
	<b>Construction &amp; maintenance of residential and official building for frontline staff</b>	
	Construction of Inspection paths for Campal Nursery	1 No.
	Construction of 3mtrs Diameter Circular platform with kerb sones at Cam for open interpretation Centre & briefing centre.	1 No.
	Construction of pathway for open Interpretation Centre & briefing centre.	80 m



	Construction of Compost unit at Campal Nursery	1 No.
	Construction of new green net shed at Campal Nursery, Campal Range.	1 No.
	Construction of Hexagonal Pargola at Campal	1 No.
	Construction of Vermi Compost unit at Campal Nursery	1 No.
	Construction of Decorative Cascade and water pond at Campal	1 No.
	Construction of chainlink fencing for extending area at open Interpretation Centre at Campal Nursery.	-
	Construction of pedestrian platform for water Tank at Campal Nursery.	1 No.
	Supply of fabrications for display of boards for murals at open Interpretation Centre Campal	-
	Supply of fabrications for cutout display of boards at open Interpretation Centre Campal	-
	Design, installation fabrication fixing commissioning of solar grid system, 1kv for NIC at Dr. Salim Ali Birds Sanctuary at Chorao.	1 No.
	Creation of Mud Flats along the Red Shank Creek Bed at Dr. Salim Ali Bird Sanctuary, Chorao.	-
	Creation of New Mud Flats along the Red Shank Creeks at Dr. Salim Ali Bird Sanctuary, Choaro.	-
	Creation Mud Flats Near RCC Tower - II (Red Shank Point) at Dr. Salim Ali Bird Sanctuary, Chorao.	-
	Creation of Mud Flats Near R. Jetty Sitting point (Mud Flat-I) at Dr. Salim Ali Bird Sanctuary, Chorao.	-
	Creation of New Mud Flats along the Inner Creeks at Dr. Salim Ali Bird Sanctuary, Chorao.	-
	Creation of New Mud Flats Near R. Jetty Sitting Point. (MudFlats-II) at Dr. Salim Ali Bird Sanctuary, Choaro.	-
	Creation of Mud Flats along the Inner Creeks at Dr. Salim Ali Bird Sanctuary, Chorao.	-
	Creation of New Mud Flats Near R. Jetty Sitting Point. (Mudflats-III) at Dr. Salim Ali Bird Sanctuary, Choaro.	-
	Creation of New Mud Flats Near R. Jetty Sitting Point. (Mudflats-IV) at Dr. Salim Ali Bird Sanctuary, Chorao.	-
	Supply of Marine Murals for Display in open Nature interpretation Centre at Campal.	3 Nos.
	Supply of Avifauna Murals for display in open Interpretation Centre at Campal.	3 Nos.
	Supply of mammal murals for display in open Interpretation Centre at Campal.	1 No.
	Supply of Reptile Mural for display in open Nature	1 No.

	Interpretation Centre a Campal.	
	Supply of Avifauna Murals for display in open Nature Interpretation Centre at Campal.	2 Nos.
	Supply of Avifauna Murals for display in open Nature Interpretation Centre at Campal.	-

## 1. Bhagwan Mahavir National Park and Wildlife Sanctuary, Mollem

### Information about CA plantations under CAMPA 2022-23 in Mollem Wildlife Sanctuary

The total area of plantation under CAMPA 2022-23 in Mollem Wildlife Sanctuary was 10 Ha and the major locations of the plantation area and its survival details are given below.

**Table Nos. 45 Detail of ANR Plantation in Mollem Wildlife Sanctuary**

2.

Locations of the plantations	Area	Survival %	Remarks
ANR plantation at Shigao beat	5 Ha	72%	Carried out and maintained properly
ANR plantation at Nadran beat	5 Ha	75%	Carried out and maintained properly

### Observations

A total of 10 Ha is planted in the Keri range under CAMPA 2022-23. Fruit bearing and indigenous plants have been carefully selected as planting stocks in all locations. About 20 different species of fruit bearing and wildlife important plants have been planted. For the good growth of seedlings proper weeding is required. The survival percentage varied from 72 to 75% and the overall survival percentage in this range was 73.5%.

**Table Nos. 46 List of major species planted in Mollem Wildlife Sanctuary**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1	<i>Tamarindus indica</i>	Chinch	11	<i>Mimusops elengi</i>	Owal
2	<i>Emblica officinalis</i>	Awala	12	<i>Sapindus emarginatus</i>	Rito
3	<i>Eugenia jambolana</i>	Jambal	13	<i>Lagerstroemia speciosa</i>	Taman
4	<i>Syzygium aqueum</i>	Jam	14	<i>Vateria indica</i>	Dhoop
5	<i>Ziziphus mauritiana</i>	Bora	15	<i>Garcinia indica</i>	Bhiran
6	<i>Terminalia catappa</i>	Badam	16	<i>Sweitenia macrophylla</i>	Mahagony
7	<i>Mangifera indica</i>	Mango	17	<i>Dalbergia latifolia</i>	Sisam
8	<i>Gmelina arborea</i>	Shivon	18	<i>Psidium guajava</i>	Peru
9	<i>Cassia fistula</i>	Bayo	19	<i>Bambusa bamboos</i>	Bamboo
10	<i>Terminalia bellirica</i>	Ghotting	20	<i>Tectona grandis</i>	Teak

Information about other CAMPA activities as per APO and its details are given below.

**Table Nos. 47 Details of APOs carried out in Mollem Wildlife Sanctuary**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1.	Repair of roofing of A-type quarter at Mollem	1 Nos.	Carried out
2.	Development & restoration of grassplot at Kalay Round	1 Ha	Carried out
3.	Development & restoration of grassplot at Mollem Round	1 Ha	Carried out
4.	Repair of roofing of A-type quarter at Mollem	1 Nos.	Carried out
5.	Eradication of Eupatorium & converting into compost by Burying at Mollem Round	10 Ha	Carried out
6.	Eradication of Eupatorium & converting into compost by Burying at Kalay Round	03 Ha	Carried out
7.	Eradication of Eupatorium & converting into compost by Burying at Caranzol Round	10 Ha	Carried out
8.	Eradication of Eupatorium & converting into compost by Burying at Kalay Round	10 Ha	Carried out
9.	Raising of 25000 Nos. of mixed fruit-bearing seedlings in 5X8 size bags	25000 Nos.	Carried out
10.	Eradication of Eupotarium & converting into compost by Burying at Collem Round	10 Ha	Carried out
11.	Development & restoration of grassplot at Surla-ii Mollem Round	0.5 Ha	Carried out
12.	Construction of labour shed at Mollem	--	Carried out
13.	Development & restoration of grassplot at Collem-I Beat Collem Round	0.5 Ha	Carried out
14.	Repair of road from ring road junction to sunset point	--	Carried out

15.	Maintenance of road from Sonaulim to Dudhsagar in BMWLS & NP	--	Carried out
16.	Maintenance of road from Shiregal to Sonaulim in BMWLS & NP	--	Carried out
17.	Maintenance of road from collem entry gate to Bhindifator & Bhindifator to Shiregal in BMWLS & NP	--	Carried out

 <p>Latitude: 15.33739 Longitude: 74.252291 Elevation: 94.0418 m Accuracy: 6.0418 m Time: 04-30-2024 09:47 Note: Repair of roof of A Type Quarters</p>	 <p>Latitude: 15.341299 Longitude: 74.251689 Elevation: 94.0429 m Accuracy: 3.9 m Time: 04-30-2024 12:25 Note: Labour shed Mollem</p>
<p><b>Repairment of roof of A Type Quarters</b></p>	<p><b>Creation of labour shed of Mollem Round</b></p>
 <p>Latitude: 15.341303 Longitude: 74.251679 Elevation: 94.0417 m Accuracy: 12.2 m Time: 04-30-2024 12:30 Note: Nursery Mollem</p>	 <p>Latitude: 15.320212 Longitude: 74.234308 Elevation: 63.15170 m Accuracy: 14.0 m Time: 04-30-2024 11:17 Note: Grass plot Kalay beat</p>
<p><b>Well raised mix-fruit seedlings in Mollem nursery</b></p>	<p><b>Physical verification of Grass plot created at Kalay Beat</b></p>
 <p>Latitude: 15.31782 Longitude: 74.19348 Elevation: 55.1731 m Accuracy: 7.24 m Time: 04-30-2024 11:30 Note: 3 Heelers plantation Shigao beat</p>	 <p>Latitude: 15.320752 Longitude: 74.19377 Elevation: 50 m Accuracy: 7.0 m Time: 04-30-2024 11:28 Note: 3 Heelers plantation Shigao beat</p>
<p><b>Mango seedling well grown at ANR plantation, Shigao beat</b></p>	<p><b>Taman seedling well grown at ANR plantation, Shigao beat</b></p>



### 3. Madhei Wildlife Sanctuary

#### Information about CA plantations under CAMPA 2022-23 in Madhei Wildlife Sanctuary

The total area of plantation under CAMPA 2022-23 in Madhei Wildlife Sanctuary was 10 Ha and the major locations of the plantation area and its survival details are given below.

**Table Nos. 48 Detail of ANR Plantation in Madhei Wildlife Sanctuary**

Locations of the plantations	Area	Survival %	Remarks
ANR plantation at Ivrem beat	5 Ha	78%	Carried out and maintained properly
ANR plantation at Surla beat	5 Ha	76%	Carried out and maintained properly

#### Observations

A total of 10 Ha is ANR plantation is carried out in Madhei WL Sanctuary. Fruit bearing and indigenous plants have been carefully selected as planting stocks in the locations. About 20 different species of fruit bearing and wildlife important plants have been planted. For the good growth of seedlings proper weeding is required. The survival percentage varied from 76 to 78% and the overall survival percentage in this range was 77%.

**Table Nos. 49 List of major species planted in Madhei Wildlife Sanctuary**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1	<i>Tamarindus indica</i>	Chinch	11	<i>Mimusops elengi</i>	Owal
2	<i>Emblica officinalis</i>	Awala	12	<i>Sapindus emarginatus</i>	Rito
3	<i>Eugenia jambolana</i>	Jambal	13	<i>Lagerstroemia speciosa</i>	Taman
4	<i>Syzygium aqueum</i>	Jam	14	<i>Vateria indica</i>	Dhoop
5	<i>Ziziphus mauritiana</i>	Bora	15	<i>Garcinia indica</i>	Bhiran
6	<i>Terminalia catappa</i>	Badam	16	<i>Sweitenia macrophylla</i>	Mahagony
7	<i>Mangifera indica</i>	Mango	17	<i>Dalbergia latifolia</i>	Sisam
8	<i>Gmelina arborea</i>	Shivon	18	<i>Psidium guajava</i>	Peru
9	<i>Cassia fistula</i>	Bayo	19	<i>Bambusa bamboos</i>	Bamboo
10	<i>Terminalia bellirica</i>	Ghotting	20	<i>Tectona grandis</i>	Teak

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 50 Details of APOs carried out in Madhei Wildlife Sanctuary**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1	Creation of grassland at Ivrem Beat in Charaundem Round of Madei Wildlife Sanctuary.	3 Ha	Carried out
2	Creation of grassland at Surla Beat in Charaundem Round of Madei Wildlife Sanctuary.	2.5 Ha	Carried out
3	Creation of grassland at Pali Beat in Charaundem Round of Madei Wildlife Sanctuary	2.5 Ha	Carried out
4	Raising of Nursery of 25,000 Nos. of 5''x 8'' size Polythene bags at Codal Protection Camp in Madei Wildlife Sanctuary.	25000 Nos.	Carried out
5	Removal of invasive species like Eupatorium, Ruthenium species for habitat Improvement and Biological Diversity enrichment at Ivrem beat in Charaundem Round in Madei Wildlife Sanctuary	20 Ha	Carried out
6	Removal of invasive species like Eupatorium, and <i>Ruthenium</i> species for habitat Improvement and Biological Diversity enrichment at Codal beat in Codal Round in Madei Wildlife Sanctuary.	10 Ha	Carried out
7	Removal of invasive species like Eupatorium, Ruthenium species for habitat Improvement and Biological Diversity enrichment at Assodem beat in Caranzol Round in Madei Wildlife Sanctuary.	10 Ha	Carried out
8	Repair and maintenance of forest road in protected area from Satre village towards Satre waterfall at Satre beat in Madei Wildlife Sanctuary.	1 km	Carried out
9	Repair and maintenance of forest road in protected area from Surla junction road to Surla Protection camp at Surla beat in Madei Wildlife Sanctuary.	2 km	Carried out
10	Repair and maintenance of forest road in protected area from Golaulim road to Antipoaching camp, Golaulim at Ivrem beat in Madei Wildlife Sanctuary.	2 km	Carried out
11	Maintenance of 'A' type quarter used as Protection Camp at Codal in Madei Wildlife Sanctuary, Madei Range.	1 Nos.	Carried out
12	Construction of Labour Shed for Nursery at Codal Nursery in Codal Round of MWLS.	1 Nos.	Carried out



**Construction of labour shed at Madei**



**Raising of seedlings at Madei Nursery**



**Guava seedling well grown at ANR plantation, Surla beat**



**Repair and maintenance of forest road in protected area, Surla junction**



**Sissoo seedling well grown at ANR plantation, Surla beat**



**Mango seedling well grown at ANR plantation, Ivrem beat**

#### **4. Bondla Wildlife Sanctuary**

**Information about other CAMPA activities as per APO and its details**

**Table Nos. 51 Details of APOs carried out in Bondla Wildlife Sanctuary**

<b>Sl. Nos.</b>	<b>Name of the work</b>	<b>Quantity</b>	<b>Remarks</b>
1	Work of Raising Canes Plantation at Ganjem beat of Bondla Wildlife Sanctuary.	5.0 Ha	Carried out
2	Maintenance of Grassplot at Bondla Wildlife Sanctuary.	1.5 Ha	Carried out
3	Maintenance of Grassplot at Deer safari at Bondla Wildlife Sanctuary.	1.0 Ha	Carried out
4	Restoration of Grassland habitat at Dharbandora beat of Bondla Wildlife Sanctuary	0.5 Ha	Carried out
5	Eradication of eupatorium & converting into compost by burning in Usgao beat of Bondla Wildlife Sanctuary.	20 Ha	Carried out
6	Restoration of Grassland habitat at Ganjem beat of Bondla Wildlife Sanctuary	0.5 Ha	Carried out





**Well raised Canes plantation at Ganjem beat**



**Canes well grown at Ganjem beat**



**Maintenance of grass plot at Bondla WL Sanctuary**



**Restoration of grassland habitat at Dharbandora beat**



## 5. Campal Wildlife Range

Information about other CAMPA activities as per APO and its details are given below.

**Table Nos. 52 Details of APOs carried out in Campal Wildlife Range**

Sl. No	Name of the work	Quantity	Remarks
1	Raising of seedlings 5" x 8"size polybags at Campal	50,000 Nos.	Carried out
2	Design, installation fabrication fixing commissioning of solar off grid system 1kv with 14hours backup after sunset at Carambolim patrolling.	1 No.	Carried out
3	Construction of Inspection paths for Campal Nursery	1 No.	Carried out
4	Construction of 3mtrs Diameter Circular platform with kerb sones at Cam for open interpretation Centre & briefing centre.	-	Carried out
5	Construction of 80mtr pathway for open Interpretation Centre & briefing centre.	80 mtr.	Carried out
6	Construction of Compost unit at Campal Nursery	1 No.	Carried out
7	Construction of new green net shed at Campal Nursery, Campal Range.	1 No.	Carried out
8	Construction of Hexagonal Pargola at Campal	1 No.	Carried out
9	Construction of Vermi Compost unit at Campal Nursery	1 No.	Carried out
10	Construction of Decorative Cascade and water pond at Campal	1 No.	Carried out
11	Construction of chainlink fencing for extending area at open Interpretation Centre at Campal Nursery.	-	Carried out
12	Construction of pedestrian platform for water Tank at Campal Nursery.	1 No.	Carried out
13	Supply of fabrications for display of boards for murals at open Interpretation Centre Campal	-	Carried out
14	Supply of fabrications for cutout display of boards at open Interpretation Centre Campal	-	Carried out
15	Design, installation fabrication fixing commissioning of solar grid system, 1kv for NIC at Dr.Salim Ali Birds Sanctuary at Chora.	1 No.	Carried out
16	Providing Design, supply & erection of green house at Campal Nursery	1 No.	Carried out
17	Providing Design, supply & erection of Mist chamber with GI pipe structure 90% shed Net wit pump and Irrigation system.	1 No.	Carried out

18	Providing Installation of 10KL water Tank & Design & Installation of UPVC main Line at Campal Nursery	1 No.	Carried out
19	Providing Installation of Micro Sprinkler with pump at Campal Nursery	-	Carried out
20	Providing Installation of Irrigation system along with filter pump with sitable Nozzle for water Cascade at Nature Education Centre at Campal	-	Carried out
21	Providing UPVC pipe lines setup with pump and clappet value at Nature Education Centre at Campal	1 No.	Carried out
22	Removing existing stumps of dead felled Casuarina trees and disposing by hiring JCB from Campal nursery WL&ET, Campal	-	Carried out
23	Creation of New Mud Flats at the Entrance of Inner Creeks at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
24	Creation of Mud Flats along the Red Shank Creek Bed at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
25	Creation of New Mud Flats along the Red Shank Creeks at Dr. Salim Ali Bird Sanctuary, Choaro.	-	Carried out
26	Creation Mud Flats Near RCC Tower - II (Red Shank Point) at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
27	Creation of Mud Flats Near R. Jetty Sitting point (Mud Flat-I) at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
28	Creation of New Mud Flats along the Inner Creeks at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
29	Creation of New Mud Flats Near R. Jetty Sitting Point. (MudFlats-II) at Dr. Salim Ali Bird Sanctuary, Choaro.	-	Carried out
30	Creation of Mud Flats along the Inner Creeks at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
31	Creation of New Mud Flats Near R. Jetty Sitting Point. (Mudflats-III) at Dr. Salim Ali Bird Sanctuary, Choaro.	-	Carried out
32	Creation of New Mud Flats Near R. Jettty Sitting Point. (Mudflats-IV) at Dr. Salim Ali Bird Sanctuary, Chorao.	-	Carried out
33	Supply of Marine Murals for Display in open Nature Interpretation Centre at Campal.	3 Nos.	Carried out
34	supply of Avifauna Murals for display in open Interpretation Centre at Campal.	3 Nos.	Carried out
35	Supply of mammal murals for display in open Interpretation Centre at Campal.	1 No.	Carried out
36	Supply of Reptile Mural for display in open Nature Interpretation Centre a Campal.	1 No.	Carried out
37	Supply of Avifauna Murals for display in open Nature Interpretation Centre at Campal.	2 Nos.	Carried out
38	Supply of Avifauna Murals for display in open Nature Interpretation Centre at Campal.	-	Carried out



**Construction of circular platform with kerb stones**



**Construction of Hexagonal parabola**



**Construction of water cascade**



**Construction of Compost unit at Campal**



**Well-constructed inspection path at Campal**



**Irrigation system installed at Nursery for public distribution at Campal**



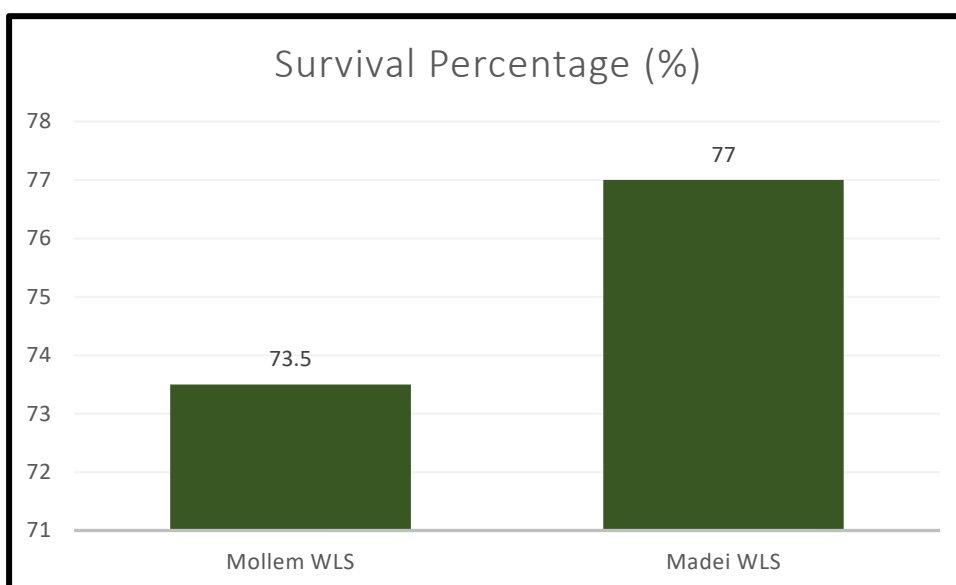


Figure 4: Bar graph illustrating the survival percentage of species across different forest ranges under North Goa Wildlife ranges.

In the North Goa Wildlife & Ecotourism Division, 20 hectares of plantations were raised in Bhagwan Mahavir National Park and Wildlife Sanctuary, Mollem, and Madei Wildlife Sanctuary. The survival rate of plants in this division varied from 73.5% to 77%, with an average survival rate of 75.25%, indicating optimal conditions or management practices.

## 7.0 Field observations in Research and Utilisation

### Division, Margao

In the Research and Utilisation Division, Margao, major activities carried out under CAMPA during the years 2022-23 were in Quepem and Valpoi. The majority of the raising of nursery plants, organizing training courses, and maintenance of plantations activities were carried out in this Division.

#### Information about APO activities under CAMPA 2022-23 in Research and Utilisation Division, Margao

**Table Nos. 53 Details of APOs carried out in Research and Utilisation  
Division, Margao**

<b>Name of the Range</b>	<b>Nature of APO activities</b>	<b>Quantity/ Area</b>	<b>Remarks</b>
<b>Research South Sanguem</b>	<b>Nursery management and seeding raising</b>		
	Raising of seedlings at Valkini Nursery, Sanguem	75000 Nos.	Carried out
	Supply of nursery materials/equipment at Valkini Nursery	27 Nos	Carried out
	Providing cement concrete circular column for erecting the boards of species at Valkini Nursery	150 Nos	Carried out
	Mesh guard for protection of Moringa (Drumstick), Papaya etc from monkeys at Valkini Nursery	1 No.	Carried out
	Construction of nursery main road at Valkini Nursery	1 No.	Carried out
	Construction of collapsed compound wall at Valkini Nursery	1 No.	Carried out
	Extension of 63mm PVC pipeline and fitting of sprinklers in the area handed over by Social Forestry at Valkini Nursery	1 No.	Carried out
	Providing and fixing GI fabricated arch at Valkini Nursery	1 No.	Carried out
<b>Research North Tisk</b>	<b>Nursery management and seeding raising</b>		
	Raising of seedlings	75000 Nos.	Carried out
	Beautification of road which passes from Arbortum gate via medicinal plot to Rashi Nakshatra Van (250 mtrs x 4 mtrs) by using	-	Carried out



Patradevi laterite stone for road surface at Satpal Arboretum and Providing and laying pathway within herbal Garden at Satpal Arboretum (450 mtrs x 1.15 mtrs)		
Renovation /Repairs to the existing roof of NIC (Phase I)	-	Carried out
Renovation /Repairs to the existing roof of NIC (Phase II)	-	Carried out
Providing resting shed in front of the canteen	-	Carried out
Painting of main gate, Arboretum gate and public toilet (washroom) at Satpal Arboretum	-	Carried out
Repairs to the existing resting shed near children Park and the existing drinking water facility shed	-	Carried out
Painting of Nature Interpretation centre, facility centre, and dormitory at Satpal Arboretum	-	Carried out
Providing fabricated steel stand at Satpal	-	Carried out
Establishment of orchidarium at Satpal Arboretum	-	Carried out
Supply of Orchids and Ferns at Satpal Arboretum	-	Carried out
Establishment of Fernarium at Satpal Arboretum	-	Carried out
Providing fabricated steel stand to fernarium at Satpal	-	Carried out
Providing fabricated steel stand to Cactus house at Satpal	-	Carried out
Supply of Cactus and orchids and pots for ferns for Orchidarium, fernarium and Cactus house at Satpal Arboretum	-	Carried out
Providing and galvulium sheet roofing to the Round office cum guest room at Ghotmode nursery	-	Carried out
Supply of sofa set at Ghotmode nursery	-	Carried out
Providing and laying water supply pipeline (120 mtrs) from water source (river) to water storage tank near working shed at Ghtomode Nursery	-	Carried out
Providing fabricated shed structure to the Nursery stock at Ghotmode Nursery	-	Carried out
Construction of 5 nos. (5x1 m) of permanent mother beds and providing small 2 nos. (5x1 m) low tunnel polyhouse structures at Ghotmode Nursery.	-	Carried out
Beautification of beds using kerbstone and making walking pathways at Ghotmode Nursery	-	Carried out
Supply of sofa set at Satpal Arboretum	-	Carried out
Supply of cutouts and various information display board in NIC at Satpal Arboretum	-	Carried out
Supply of Fibre Murals for display in NIC at Satpal Arboretum	-	Carried out

	Supply of Fibre murals for display in open area at Satpal Arboretum	-	Carried out
	Supply of Display boards at Satpal Arboretum	-	Carried out
	Supply and installation of display board at various locations in Satpal Arboretum	-	Carried out
	Installation of supplied cutouts, murals and display board in NIC at Satpal Arboretum	-	Carried out
	Supply and installation of electronic items in Satpal Arboretum	-	Carried out
	Supply of Electronic medium and accessories for documentation in Satpal Arboretum	-	Carried out
<b>Research</b>	<b>Nursery management and seeding raising</b>		
<b>North Valpoi</b>	Raising of seedlings	25000 Nos.	Carried out





**Fabricated shed at Ghotmode Nursery, Tisk**



**Permanent mother beds at Ghotmode Nursery, Tisk**



**Repaired rooftop of NIC at Satpal nursery**



**Resting shed near canteen, Satpal nursery**



**Supply of fern stand and orchids, Satpal nursery**



**Mesh guard installed at Valkini nursery**



## 8.0 Field observations in Social Forestry, Parks and Gardens, Ponda

In Social Forestry, Parks and Gardens, Ponda, major activities carried out under CAMPA during the year 2022-23 were in Quepem, Ponda Usgao and Panji. Majorly raising of nursery and maintenance of plantations activities were carried out in this Division.

### Information about APO activities under CAMPA 2022-23 in Social Forestry, Parks and Gardens, Ponda

**Table Nos. 54 Details of APOs carried out in Social Forestry, Parks and Gardens, Ponda**

Name of the Range	Nature of APO activities	Quantity/ Area	Remarks
Usgao Range	<b>Nursery Management and seeding raising</b>		
	Raising 5" x 8" polybags p at Pal Usgao Nursery Under CA	20000 Nos.	Carried out
	Raising 5" x 8" polybags Fruit Bearing seedlings at Pal Usgao Nursery Under CA	10000 Nos.	Carried out
	<b>Management of Biological Diversity and Biological Resources</b>		
	Raising Roadside Plantation along the Pirna road, 2R/Km	Carried out	Carried out
	<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		
	Construction of Labour Shed at Netaji Subhas Chandra Bose Gram Upvan, Sankhali	1 No.	Carried out
	Training and Sensitization of protection Staff (Forest Guard, Watch and Ward and Watchman)	-	Carried out
	Planting tree for Vanamahotsava 2022 at Advalpa and Korgao	-	Carried out
	Organization of Nature Walk/ Bird Walk at Bondla Wildlife Sanctuary on occasion of	-	Carried out

	Wildlife Week Celebration 2022-23		
	Celebration of Environment Day at Sankhali	-	Carried out
	Celebration of Vanamahotsava 2022 at Provorum	-	Carried out
	Celebration of Forest Conservation Day at Sankhali	-	Carried out
	Planting tree for Vanamahotsava 2022 at Usgao and Kunde	-	Carried out
	Engagement of Fire Watchers at various Roadside Plantations	-	Carried out
<b>Ponda Range</b>	<b>Raising Roadside Plantation for urban greening</b>		
	Maintenance of Roadside plantation from MIBK to Mudder 1st Year	-	Carried out & maintained well
	Maintenance of Roadside plantation from Khandepar to Opa 1st Year	-	Carried out & maintained well
	Maintenance of Roadside plantation from Dhavali By pass to Farmagudi 1st Year	-	Carried out & maintained well
	2nd year maintenance of Enrichment roadside plantation from Madkai Industrial Estate to Tapobhumi Kundai	-	Carried out & maintained well
	2nd year maintenance of roadside plantation at Tivrem Marcel	-	Carried out & maintained well



2nd year maintenance of roadside plantation at ITI road Farmagudi	-	Carried out & maintained well
2nd year maintenance of road divider from Farmagudi to Dhavali by pass road	-	Carried out & maintained well
2nd year maintenance of road divider from Old RTO Office to Khandepar	-	Carried out & maintained well
<b>Construction &amp; maintenance of residential and official building for frontline staff</b>		
Construction of labour shed	1 No.	Carried out
<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		
Organising training & sensitization of nature guides, protection staff and trackers	-	Carried out
Celebration of Vanamahotsava at Pragati High School Borim	-	Carried out
Celebration of Vanamahotsava 2022 at various places in Ponda	-	Carried out
Supply of T-Shirts for celebration of World Yoga Day	-	Carried out
Organizing Training & Sensitization of Nature Guides, Protection Staff & Trackers at Ponda	-	Carried out
Celebration of World Environmental Day on 5th June 2022	-	Carried out
<b>Nursery Management and seeding raising</b>		
Raising of 5"x8" Polybags seedlings Nursery for CA plantation	50000 Nos.	Carried out

	Raising of 5"x8" Polybags seedlings Nursery at Dhavali (Ornamental plants free distribution)	25000 Nos.	Carried out
	Maintenance of 5" x 8" Polybags seedlings Nursery at Ponda	25000 Nos.	Carried out
<b>Quepem Range</b>	<b>Nursery Management and seeding raising</b>		
	Raising of 5" x 8" size Polybags seedlings for public distribution behind Range Forest Office, Social Forestry, Quepem - Goa	25000 Nos.	Carried out
	Raising of 5" x 8" size Polybags seedlings for public distribution behind Range Forest Office Social Forestry Range Quepem	15000 Nos.	Carried out
	<b>Construction &amp; maintenance of residential and official building for frontline staff</b>		
	Construction of labour shed	1 No.	Carried out
	<b>Maintenance of Old Block Plantations on Govt. Lands</b>		
	Maintenance of roadside avenue plantation from Assolda Junction to Oddar of the year 2020-21 (2nd year maintenance)		Carried out & maintained well
	<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		
	Organising training & sensitization of nature guides, protection staff and trackers	-	Carried out
<b>Panaji Range</b>	<b>Nursery Management and seeding raising</b>		
	Raising of Ornamental seedlings in 5"x8" polyethene bags at Landscape Garden Dona Paula (free distribution)	20000 Nos.	Carried out
	Raising of Ornamental seedlings in 5"x8" polyethene bags at Dr. Ambedkar Garden Panaji (free distribution)	10000 Nos.	Carried out
	<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		Carried out







Organising training & sensitization of nature guides, protection staff and trackers	-	Carried out
Vanamahotsava 2022 Programme at Raj Bhavan Cabo	-	Carried out
Celebration of World Forestry Day Programme 2022	-	Carried out
Celebration of Wildlife week Bird walking programme for Students and Teachers at Art Park Campal	-	Carried out
Accommodation and Hiring of Hall for Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona Paula	-	Carried out
Food arrangement for Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona Paula	-	Carried out
Delegates kits for participant and souvenir for Resource person for Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona Paula	-	Carried out
Installation of stages in open hall for Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona Paula	-	Carried out
Pre -Arrangement meeting for Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona Paula	-	Carried out
Decoration of flowers, display boards, banners etc. for Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona	-	Carried out

	Paula		
	Traveling Expenses for resource persons for Stakeholder Workshop Programme	-	Carried out
	Printing photos and making album of Stakeholders Workshop of Forest Department to encourage commercial tree plantation in private non- forest land at International Centre Goa Dona Paula	-	Carried out
	Creating awareness among School for preservation and conservation of Forest on World Environment Day at Art Park and Chorao Salim Ali Bird Sanctuary	-	Carried out

**Table Nos. 55 Some important seedlings raised for nursery and roadside plantation under Social Forestry, Parks and Gardens, Ponda**

Sr. Nos.	Local Name	Botanical Name	Sr. Nos.	Local Name	Botanical Name
1.	Bel	<i>Aegle marmelos</i>	15.	Peru	<i>Psidium guajava</i>
2.	Fanas/Jackfruit	<i>Artocarpus heterophyllus</i>	16.	Sitafal/ Custard apple	<i>Annona aquamosa</i>
3.	Shankar	<i>Caesalpinia pulcherrima</i>	17.	Shiras	<i>Albizia lebbek</i>
4.	Bayo	<i>Cassia fistula</i>	18.	Bougainvillea	<i>Bougainvillea spp.</i>
5.	Golden Duranta	<i>Duranta repens gold</i>	19.	Tecoma	<i>Tecoma stans</i>
6.	Bhirand	<i>Garcinia indica</i>	20.	Almanda	<i>Allamanda cathartica</i>
7.	Daswanti/Jaswand	<i>Hibiscus rosa-sinensis</i>	21.	Mango	<i>Mangifera indica</i>
8.	Taman	<i>Lagerstroemia spp.</i>	22.	Jam	<i>Syzygium aqneum</i>
9.	Oval	<i>Mimusops elengi</i>	23.	Croton	<i>Codiaeum variegatum</i>
10.	Toofia	<i>Phyllanthus spp.</i>	24.	Anant	<i>Tabermintana divaicata</i>
11.	Jambhal	<i>Syzygium cumini</i>	25.	Variegated Duranta	<i>Duranta repens variegata</i>
12.	Chinch	<i>Tamarindus indica</i>	26.	Otamb	<i>Artocarpus lakoocha</i>
13.	Badam	<i>Terminalia catappa</i>	27.	Neem	<i>Azadirachta indica</i>
14.	Bhendi	<i>Thespesia pepllnea</i>	28.	Ashok Tree	<i>Saraca asoca</i>



 <p>Latitude: 15.217945 Longitude: 74.081785 Elevation: 40.72±26 m Accuracy: 5.5 m Time: 05-02-2024 12:33 Note: Remaining stock in Nursery Quipers</p>	 <p>Latitude: 15.262763 Longitude: 74.074407 Elevation: 17.42±39 m Accuracy: 4.5 m Time: 05-02-2024 13:30 Note: Maintenance of road side plantation Quepem</p>
<p><b>Physical verification of Fruit Bearing/ Forestry seedlings at Quepem Nursery</b></p>	<p><b>Maintenance of roadside plantation Assolda Junction to Oddar at Quepem</b></p>
 <p>Latitude: 15.389931 Longitude: 74.005682 Elevation: 26.76±19 m Accuracy: 7.5 m Time: 05-02-2024 16:10 Note: Construction of labour shed Ponda</p>	 <p>Latitude: 15.438873 Longitude: 74.075334 Elevation: 32.0±29 m Accuracy: 3.9 m Time: 05-05-2024 08:23 Note: Remaining seedlings in Nursery Usgao</p>
<p><b>Construction of labour shed at Ponda</b></p>	<p><b>Physical verification of Ornamental seedlings in 5'x8' polyethene bags at Pal Usgao nursery</b></p>
 <p>Latitude: 15.407065 Longitude: 74.006909 Elevation: 28.89±17.56 m Accuracy: 40.00 m Time: 02-05-2024 16:48:21 Note: Maintenance of roads/road plantation Ponda</p>	 <p>Latitude: 15.467753 Longitude: 73.83673 Elevation: 21.79±1 m Accuracy: 4.3 m Time: 05-04-2024 16:10 Note: Remaining seedlings in Panaji Dr Ambedkar Park</p>
<p><b>Maintenance of road divider from Farmagudi to Dhavali by pass road, Ponda</b></p>	<p><b>Physical verification of Ornamental seedlings in 5'x8' polyethene bags at Dr. Ambedkar Garden, Panaji</b></p>



## 9.0 Field observations in Soil Conservation Division, Ponda

In Soil Conservation Division, Ponda, major activities carried out under CAMPA during the year 2022-23 were in Quepem, Bhironda, and, Ponda Majorly raising of nursery, and maintenance of plantations activities were carried out in this Division.

### Information about APO activities under CAMPA 2022-23 in Soil Conservation Division, Ponda

**Table Nos. 56 Details of APOs carried out in Soil Conservation Division, Ponda**

Name of the Range	Nature of APO activities	Quantity/ Area	Remarks
<b>Ponda, Dhavali</b>	<b>Nursery Management and seeding raising</b>		
	Raising of cane plantations	27000	Carried out
	Raising of 5"x8" polybags seedling nursery for public distribution. at Ganjem	Nos.	
	Maintenance of one year old Seedlings 10"x14" HDPE bags at Dhavali-Ponda	7000 Nos.	Carried out & maintained well
	Maintenance of 5"x8" ploybag seedlings nursery (Forestry & Bamboos) at Dhavali-Ponda	10000 Nos.	Carried out & maintained well
	Maintenance of two-year-old. 5"x8" ploybag seedlings nursery at Dhavali-Ponda	18000 Nos.	Carried out & maintained well
	Maintenance of One year old Canes seedlings nursery at Ganjem	20000 Nos.	Carried out & maintained well
	Maintenance of 5"x8" polybags seedling nursery (Forestry & Bamboos). at Dhavali-Ponda.	16800 Nos.	Carried out & maintained

			well
	Maintenance of 5"x8" polybags canes seedling nursery. at Ganjem	1190 Nos.	Carried out & maintained well
	<b>Protection of plantations and Forest</b>		
	Maintenance of one year old Canes plantation at Ganjem	5.00 Ha	Carried out & maintained well
	Maintenance of one year old Canes plantation at Ganjem	5.00 Ha	Carried out & maintained well
	<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		
	POL charges of Motorcycle under CAMPA.	4 Nos.	Carried out
	Maintenance of office Motorcycles (04nos.) and Scorpio GA-07-G-6699.	-	Carried out
	Repair of motor cycle bearing no. GA 07 G 0301	-	Carried out
	Planting of trees for Vanamahotsav at different places.	-	Carried out
	Digging of staggered contour soil trenches of size 1.00mts x 0.50mts x 0.50mts at Ganjem under CAMPA.	-	Carried out
	POL charges of. Motorcycle under CAMPA.	4 Nos.	Carried out
	Construction of compound wall near 'B' type quarters in Forest colony Dhavali, Ponda-Goa	1 No.	Carried out
	Construction of retaining wall near Range office under CAMPA.	37 m	Carried out
	Creation of water retaining sunken pond/water hole of size 12.00mts X 8.50mts at Gurkhe Dharbandora under CAMPA.	1 No.	Carried out
	Repair of Labour shed painting and roofing at	1 No.	Carried out

	Dhawali-Ponda.		
	Construction of parking shed in front of Range office, Dhawali-Ponda under CAMPA	1 No.	Carried out
	Construction of access to labour shed at Dhawali Ponda	1 No.	Carried out
	Maintenance of office Motorcycles and Scorpio GA-07-G-6699.	4 Nos.	Carried out
	Supply of 6.50 m3 cow dung for nurturing older seedling in nursery and earthen pots of ornamental plants	-	Carried out
	Creation awareness among general public preservation and conservation of Forestry by celebrating important days like World Environment Day and Wildlife week under (campa	-	Carried out
<b>Bhironda Range</b>	<b>Nursery Management and seeding raising</b>		
	Maintenance of mixed forest species 13000-nos at Bhironda	13000 Nos.	Carried out
	Maintenance of 5'' x 8'' polybag seedling nursery at Bhironda (Canes)	35000 Nos.	Carried out
	Maintenance of (mix forestry species) 5'' x 8'' polybag seedling nursery at Bhironda	7000-nos	Carried out
	Raising of 5'' x 8'' polybags canes nursery at Bhironda	11000 Nos.	Carried out
	Raising of 5'' x 8'' polybags fruit bearing & Bamboo nursery at Bhironda	8000 Nos.	Carried out
	<b>Protection of plantations and Forest</b>		
	Maintenance of one year old canes plantation at Shel Melauli	2.5 ha	Carried out
	Maintenance of one year old canes plantation at Ponsuli ker	5.00 ha	Carried out
	Maintenance of canes plantation at Gawane part- I	5.00 ha	Carried out
	Maintenance of canes plantation at Gawane part- II	5.00 ha	Carried out

	Maintenance of canes plantation at Gawane part-III	5.00 ha	Carried out
	Maintenance of one year old fruit bearing & garden plants at Govt. high school morlem, Govt. ITI Honda, Govt. primary school & Govt. high school morlem 3.00 ha (3x3)	1800 Nos.	Carried out
	<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		
	Trees plantation activities and free distribution of seedlings vanmahotsav at Pali, Copardem and Charavane	-	Carried out
	Digging of staggered contour soil trenches of size 1.00mt x 0.50mt x 0.50mt at Gullem	422 Nos.	Carried out
	Painting of Range office Bhironda	1 No.	Carried out
	Creation of water retaining sunken pond/waterhole at size 8.00mt x 8.00mts at Cupan at Melauli.	1 No.	Carried out
	Material for raising of 8000 nos. seedling nursery at Bhironda	8000 Nos.	Carried out
<b>Quepem Range</b>	<b>Nursery Management and seeding raising</b>		
	Raising of new mix seedlings nursery		Carried out
	Maintenance of one year old cane seedlings nursery (raised in year 2022-23-22)		Carried out
	Maintenance of two-year-old mix seedlings nursery (raised in year 2020-21)		Carried out
	<b>Capacity Building &amp; Training, Publicity &amp; Awareness Creation etc.</b>		
	POL of motor cycle bearing vehicle no GA 07 G 1607	1 No.	Carried out
	Maintenance of office motor cycle bearing vehicle no GA 07G 1607	1 No.	Carried out
	Digging of staggered contour trenches of size 1.00 mts x 0.50 mts x 0.50 mts	830 Nos.	Carried out
	Construction of toilet facilities for ladies in Quepem Range	1 No.	Carried out

	Repair to the Temporary labour shed including, flooring roofing side wall etc at Valkini Sanguem	1 No.	Carried out
	Construction of water hole at Valkini Sanguem	1 No.	Carried out
	Creation awareness among general public preservation and conservation of Forestry by celebrating important days like World Environment Day and Wildlife week		Carried out

**Table Nos. 57 Some important seedlings raised and transplanted under Soil Conservation Division, Ponda**

Sl. Nos.	Local Name	Botanical Name	Sl. Nos.	Local Name	Botanical Name
1	Panas	<i>Artocarpus heterophyllus</i>	14	Sonchafa	<i>Magnolia champaca</i>
2	Chinch	<i>Tamarindus indica</i>	15	Jambal	<i>Syzygium cumini</i>
3	Bayo	<i>Cassia fistula</i>	16	Oval	<i>Mimusops elengi</i>
4	Rito	<i>Sapindus emarginatus</i>	17	Saylo	<i>Tectona grandis</i>
5	Bhirand	<i>Garcinia indica</i>	18	Vavlo	<i>Holoptelia integrifolia</i>
6	Sisum	<i>Dalbergia latifolia</i>	19	Rumod	<i>Ficus glamerota</i>
7	Alam	<i>Machilus macrantha</i>	20	Mango	<i>Mangifera indica</i>
8	Taman	<i>Lagerstroemia flosergina</i>	21	Jham	<i>Syzygium malaccense</i>
9	Limbu	<i>Citrus limon</i>	22	Putranjiva	<i>Putranjiva roxburgii</i>
10	Shivan	<i>Gmelina arborea</i>	23	Peru	<i>Psidium guajava</i>
11	Ottam	<i>Artocarpus lakucha</i>	24	Avacado	<i>Persea americana</i>
12	Chafra	<i>Flacourtia montana</i>	25	Ghotting	<i>Terminalia bellirica</i>
13	Tikhi	<i>Cinnamomum zelanicum</i>	26	Matti	<i>Terminalia tomentosa</i>



	
<p><b>Maintenance of Canes plantation at Gawne beat, Bhironda</b></p>	<p><b>Physical verification of 5" x 8" polybag seedlings at Bhironda</b></p>
	
<p><b>Physical verification of water hole at the Social Forestry Range in Quepem</b></p>	<p><b>Compound wall constructed in forest colony, Ponda</b></p>
	
<p><b>Well-constructed access to labour shed in forest colony, Ponda</b></p>	<p><b>Digging of staggered contour soil trenches at Ganjem, Ponda</b></p>



## 10.0 Field observations in Goa Forest Development Corporation (GFDC), Panaji

In Goa Forest Development Corporation (GFDC), Panaji major activities carried out under CAMPA during the year 2022-23 was 200 Ha of ANR plantations, creation of fire lines, and the eradication of weeds.

**Table Nos. 58 Details of ANR plantations in Goa Forest Development Corporation (GFDC), Panaji**

Name of the Range	Location of ANR Plantation	Area	Survival (%)	Remarks
<b>Ponda</b>	Curti C. No. 15	5 Ha	78 %	Carried out
	Odkarwada Bl. No.1&2	5 Ha	82 %	Carried out
	Nirankal	5 Ha	76 %	Carried out
	Gagridevamol	2 Ha	84 %	Carried out
	Khandepar Nandan	2 Ha	85 %	Carried out
	Ganjem	10 Ha	77 %	Carried out
	Kasaulim	8 Ha	80 %	Carried out
	Panchawadi Bl. No. 5	9 Ha	75 %	Carried out
	Gurkhe	4 Ha	85 %	Carried out
<b>Morlem</b>	Nanoda	10 Ha	74 %	Carried out
	Bhuipal	10 Ha	75 %	Carried out
	Mopa-I	10 Ha	72 %	Carried out
	Mopa-II	10 Ha	76 %	Carried out
<b>Canacona</b>	Gaondongrim B.No 5(A)	10 Ha	78 %	Carried out
	Agonda	10 Ha	80 %	Carried out
	Hedumoll	10 Ha	75 %	Carried out
	Paddi Kanibag	10 Ha	79 %	Carried out
	Coltozem	5 Ha	74 %	Carried out
	Bhatpal (A)	5 Ha	75 %	Carried out
	Gaondongrim B. No 6 (B)	5 Ha	82 %	Carried out
<b>Quepem</b>	Fatorpa B.No.5 (71-72)	5 Ha	72 %	Carried out
	Miana C.No. 1, B.No.1 to 4 (73-74)	5 Ha	74 %	Carried out
	Maina C.No. 11D (74-75)	5 Ha	76 %	Carried out
	Vaghdongri Curdi (74-75)	5 Ha	70 %	Carried out
	Vichundrem C.No.19 (76-77)	5 Ha	75 %	Carried out
	Vichundrem C.No. A (78-79)	5 Ha	73 %	Carried out
	Valkinimol (78-79)	5 Ha	80 %	Carried out
	Vagona B.No.1 &2 (74-75)	10 Ha	76 %	Carried out
	Cariamol Tariamol Condir (71-72)	10 Ha	78 %	Carried out

## Observations

A total of 200 Ha is planted in Ponda, Morlem, Canacona and Quepem under the Goa Forest Development Corporation (GFDC). Fruit bearing and indigenous plants have been carefully selected as planting stocks in all locations. About 20 different species of fruit bearing and wildlife important plants have been planted. For the good growth of seedlings proper weeding is required. The survival percentage varied from 70 to 85% and the overall survival percentage was found in Ponda (80.2%), Morlem(74.2%), Canacona(77.5%), and Quepem (74.8%)

**Table Nos. 59 List of major species planted in Keri Range**

Sl. Nos.	Species Name	Common Name	Sl. Nos.	Species Name	Common Name
1	<i>Anacardium occidentale</i>	Chinch	11	<i>Mimusops elengi</i>	Owal
2	<i>Emblica officinalis</i>	Awala	12	<i>Sapindus emarginatus</i>	Rito
3	<i>Eugenia jambolana</i>	Jambal	13	<i>Lagerstroemia speciosa</i>	Taman
4	<i>Syzygium aqueum</i>	Jam	14	<i>Vateria indica</i>	Dhoop
5	<i>Ziziphus mauritiana</i>	Bora	15	<i>Garcinia indica</i>	Bhiran
6	<i>Terminalia catappa</i>	Badam	16	<i>Sweitenia macrophylla</i>	Mahagony
7	<i>Mangifera indica</i>	Mango	17	<i>Dalbergia latifolia</i>	Sisam
8	<i>Gmelina arborea</i>	Shivon	18	<i>Psidium guajava</i>	Peru
9	<i>Cassia fistula</i>	Bayo	19	<i>Bambusa bamboos</i>	Bamboo
10	<i>Terminalia bellirica</i>	Ghotting	20	<i>Tectona grandis</i>	Teak

## Information about APO activities under CAMPA 2022-23 in Goa Forest Development Corporation (GFDC), Panaji

**Table Nos. 60 Details of Work Carried for the year 2022-23 under Goa Forest Development Corporation (GFDC), Panaji**

Name of the Range	Nature of APO activities	Quantity/ Area	Remarks
Morlem	<b>Nursery Management and seeding raising</b>		
	Raising of Cashew seedlings 6'*10'' size at Veluz Nursery for plantations	10000 Nos.	Carried out
	<b>Protection of plantations and Forest</b>		
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Bhuipal	2 R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Saleli	2 R/km	Carried out

	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Saleli	2 R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Kasarvarnem	1.5 R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Kasarvarnem	1 R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Ibrampur	2.5R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Raven	3 R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Naneli	3 R/km	Carried out
	Maintenance and creation of Fireline/ clearance along Cashew Plantation at Khodiem	2 R/km	Carried out
	Fire line creation and Fire watcher for Assistance Natural Regeneration Mixed plantation at Nanoda	2 R/km	Carried out
	Fire line creation and Fire watcher for Assistance Natural Regeneration Mixed plantation at Bhuipal	2.5 R/km	Carried out
	Fire line creation and Fire watcher for Assistance Natural Regeneration Mixed plantation at Mopa	2 R/km	Carried out
	Fire line creation and Fire watcher for Assistance Natural Regeneration Mixed plantation at Mopa	2.5 R/km	Carried out
	Eradication of Eupatorium weeds at Velguem Block No.1 to 2	10 Ha	Carried out
	Eradication of Eupatorium weeds at Kasarvarnem	10 Ha	Carried out
	Eradication of Eupatorium weeds at Sal, Item No.55, 56,57, (1969-70, 1970-71,1974-75)	10 Ha	Carried out
	Eradication of Eupatorium weeds at Khodiem, Item No.73,(1973-74)	10 Ha	Carried out
	Eradication of Eupatorium weeds at Maloli V-4, Item No.91,(2006-07)	10 Ha	Carried out
	Eradication of Eupatorium weeds at Maloli (FLT) Item No.93, (2007-08)	10 Ha	Carried out

	Eradication of Eupatorium weeds at Kasarvarnem Item No.47, (1973-74)	10 Ha	Carried out
	Eradication of Eupatorium weeds at Kudshem Item No.100,101 (1969-70, 1974-75)	10 Ha	Carried out
	Eradication of Eupatorium weeds at Morlem Block No:1 to 3 Item No.34,(1969-70)	10 Ha	Carried out
	Eradication of Eupatorium weeds at Mayem Block No.2 Item No.2(1974-75)	5 Ha	Carried out
	Eradication of Eupatorium weeds at Dhavem Item No.86(1977-78)	5 Ha	Carried out
<b>Canacona Range</b>	<b>Eradication of eupatorium from plantations</b>		
	Khedem B. No. 4 to 5 (B)	10 Ha	Carried out
	Khedem B. No. 1 to 3 (A)	10 Ha	Carried out
	Chapoli	10 Ha	Carried out
	Agonda	10 Ha	Carried out
	Gaondongrim B. No. 10	10 Ha	Carried out
	Ozrem	10 Ha	
	Gullem	5 Ha	Carried out
	Gaondongrim B. No. 8	5 Ha	Carried out
	Gaondongrim B.No 1 & Ozrem Plot No. E 4	5 Ha	Carried out
	<b>Creation of Fire Line &amp; Fire Water for ANR Plantation</b>		
	Agonda	10 Ha	Carried out
	Paddi - Kanibag	10 Ha	Carried out
	Coltozem	5 Ha	Carried out
	Hedumoll	10 Ha	Carried out
	Bhatpal (A)	5 Ha	Carried out
	Gaondongrim B.No.5 (A)	10 Ha	Carried out
	Gaondongrim B.No 6(B)	5 Ha	Carried out
	<b>Fire Line Creation</b>		
	Paddi Kanibag, Kheddem B.No. 6,7,8,9	5 Ha	Carried out
	Barcem Coltozem, Dabem, Kheddem	10.05 Ha	Carried out
	Gaondongrim B.No. 9,10, Ozrem plot E-4,	5 Ha	Carried out



	Bhatpal (A) & Bhatpal (B)		
	Bhatpal & Bhatpal	2.05 Ha	Carried out
	Gullem , Porogorro, Corop & Corop	10 Ha	Carried out
	Agonda & Palolem	5 Ha	Carried out
	Gaondongrim B. No. 1 to 4, 5,6,7,8	5 Ha	Carried out
	Gaondongrim, Kharsang, Fondsoirem	8.5 Ha	Carried out
	Kindalkatto Corop & Kharsang	13 Ha	Carried out
<b>Quepem Range</b>	<b>Eradication of Eupatorium Weeds at old cashew plantation</b>		
	Bandol Kirpal (68-69)	10 Ha	Carried out
	Fatorpa B.No.6 (71-72)	10 Ha	Carried out
	Fatorpa B.No.7 & 8 (71-72)	10 Ha	Carried out
	Valkinimol (78-79)	10 Ha	Carried out
	Caurem (64-65)	10 Ha	Carried out
	Vichundrem C.No.10 (75-76)	10 Ha	Carried out
	Maina C.No.12B (75-76)	5 Ha	Carried out
	Vicundrem C.No.B (78-79)	10 Ha	Carried out
	Vaghdongri Curdi (74-75)	15 Ha	Carried out
	Pimplamol Condir (71-72)	10 Ha	Carried out
	<b>Creation of New Fire line &amp; Fire watchers for Assisted Natural Regeneration</b>		
	Fatorpa B.No.5 (71-72)	5 Ha	Carried out
	Maina C.No. 1, B.No.1 to 4 (73-74)	5 Ha	Carried out
	Maina C.No. 11D (74-75)	5 Ha	Carried out
	Vaghdongri Curdi (74-75)	5 Ha	Carried out
	Vichundrem C.No.19 (76-77)	5 Ha	Carried out
	Vichundrem C.No. A (78-79)	5 Ha	Carried out
	Valkinimol (78-79)	5 Ha	Carried out
	Vagona B.No.1 & 2 (74-75)	10 Ha	Carried out
	Cariamol Tariamol Condir (71-72)	10 Ha	Carried out
	<b>Fire Line Protection</b>		
	Quittal & Fatorpa	5 Km	Carried out
	Antorion C.No.11A, Antorion C.No.11B &	6 Km	Carried out

Rumde		
Maina C.No.1, B.no. 1 to 4, Maina C.No.13C, Maina C.No.11B	6 Km	Carried out
Vaghdongri Curdi	2 Km	Carried out
Pimplamol Condir, Deusa, Cariamol & Tariamol, Condir, Sirvoi, Pedamol & Sanvorimol Condir	8 Km	Carried out
Bhatimol C.No.12B, Bhatimol C.No.12B, B.No.1 & 2, Vaghped Bhati, Bhatimol C.No.B	6 Km	Carried out
Vichundrem C.No.20A, Vichundrem C.No.20B & Vinchundrem C.No.B	6 Km	Carried out
<b>Fire Line Creation</b>		
Fatorpa B.No.1 & 2, Fatorpa B.No.4,7 & 8, Fatorpa B.No.5 & 6, Fatorpa B.No.13, 14, 15, 16 & Quittal	2 Km	Carried out
Antorim C.No.11A & Antorim C.No.11B, Bandol Kirlapal, Kamarkhand A & Vagona B.No.1 & 2	3 Km	Carried out
Caurem	2 Km	Carried out
Vaghdongri Curdi	2 Km	Carried out
Valkinimol	2 Km	Carried out
Pimplamol Condir & Tariamol, Pedamol & Sirvoi Tilamol	2 Km	Carried out
Vichundrem	2 Km	Carried out
<b>Construction &amp; maintenance of residential and official building for frontline staff</b>		Carried out
Renovation of Roof of Smoke house of Rubber Plantation at Talsai Curdi Sanguem Goa	1 No.	Carried out
Renovation of Roof of Labour Shed of Rubber Plantation at Talsai Curdi Sanguem Goa	1 No.	Carried out



	 <p>Latitude: 15.437086 Longitude: 74.14206 Elevation: 40.16427 m Accuracy: 2.7 m Time: 05-08-2024 09:49 Note: ANR plantation Oakwada, Cashew GFDC</p>
<p><b>Cashew seedlings at ANR plantation Nirankal, Ponda</b></p>	<p><b>ANR plantation at Oakwada, Ponda</b></p>
 <p>Latitude: 15.739111 Longitude: 73.367737 Elevation: 40.49446 m Accuracy: 4.5 m Time: 05-08-2024 17:07 Note: ANR plantation Mopa-I, Morlem</p>	 <p>Latitude: 15.437086 Longitude: 74.14206 Elevation: 40.16427 m Accuracy: 2.7 m Time: 05-08-2024 09:49 Note: ANR plantation Oakwada, Cashew GFDC</p>
<p><b>ANR plantation at Mopa-I, Morlem</b></p>	<p><b>Cashew seedling well grown at Valkinimol, Quepem</b></p>
 <p>Latitude: 15.024892 Longitude: 74.107745 Elevation: 105.75a29 m Accuracy: 2.0 m Time: 05-09-2024 05:40 Note: ANR plantation and fruit bearing GACHODRIM CANACONA Range GFDC</p>	 <p>Latitude: 15.024892 Longitude: 74.107745 Elevation: 105.75a29 m Accuracy: 2.0 m Time: 05-09-2024 05:40 Note: ANR plantation and fruit bearing GACHODRIM CANACONA Range GFDC</p>
<p><b>Well maintained ANR plantation at Gangodrim, Canacona</b></p>	<p><b>Cashew seedling growing well at Vinchundrem, Quepem</b></p>



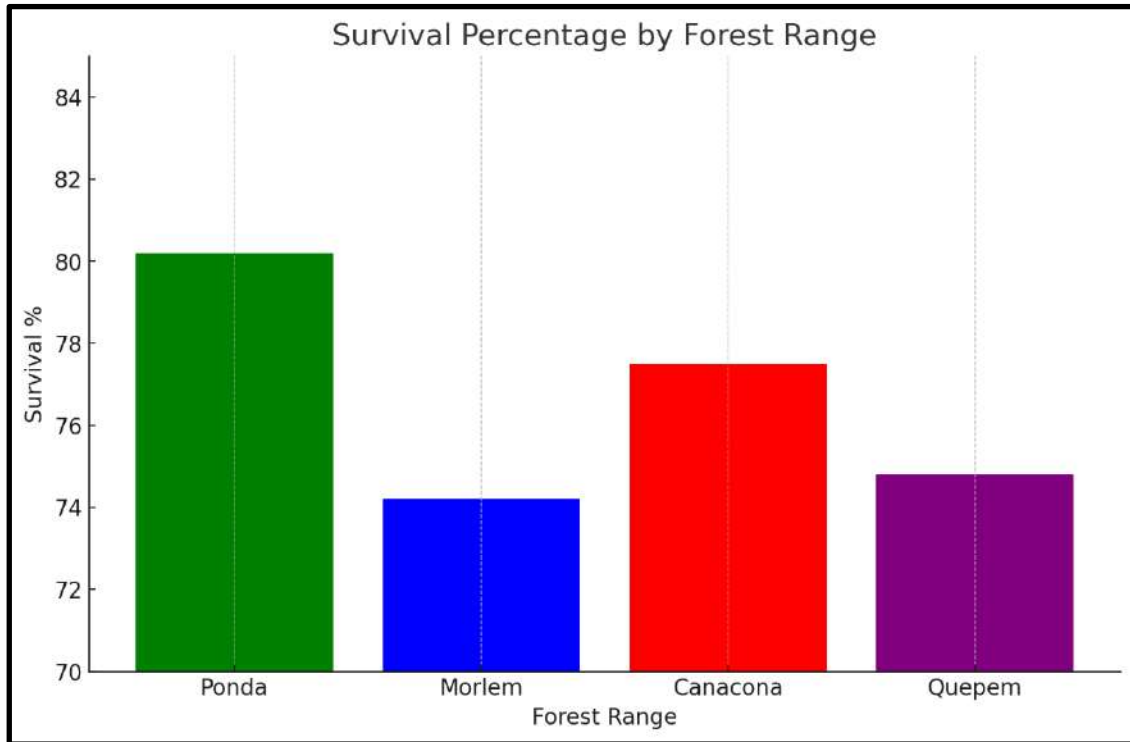


Figure 5: Bar graph illustrating the survival percentage of species across different forest ranges under Goa Forest Development Corporation (GFDC)

The analysis of survival percentages across the forest ranges is quite positive. Ponda has the highest survival rate at 80.2%, indicating strong ecological conditions in this range. Canacona follows with 77.5%, suggesting effective conservation efforts. Morlem and Quepem have similar survival rates of around 74%, which, while slightly lower, still demonstrate a relatively healthy ecosystem. The overall high survival rates reflect positively on the environmental conservation measures in place.

## PLANTATION CHART

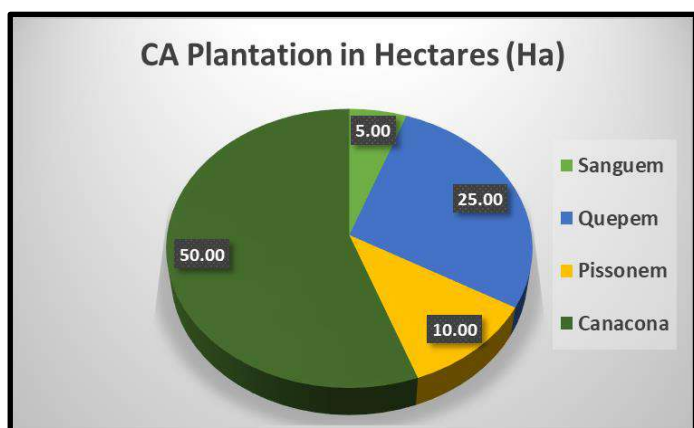


Figure 6: Chart illustrating the total CA plantations raised in South Goa Territorial Division

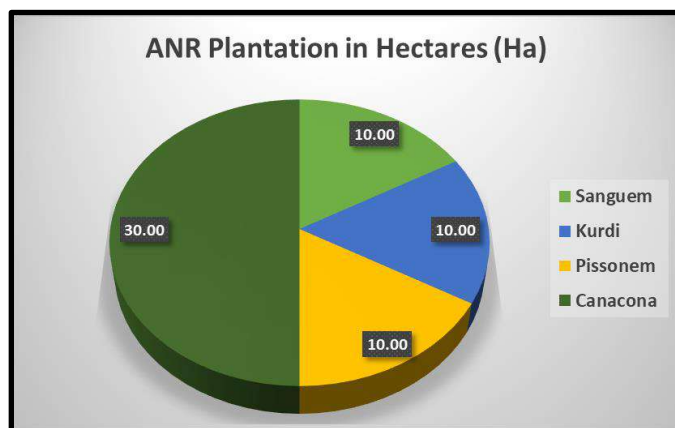


Figure 7: Chart illustrating the total ANR plantations raised in South Goa Territorial Division

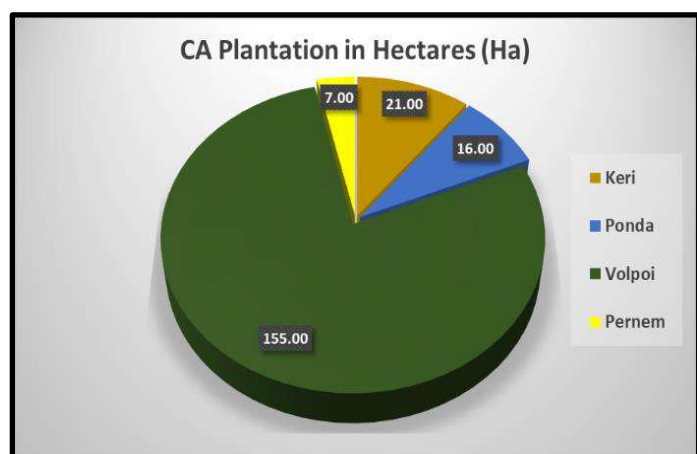


Figure 8: Chart illustrating the total CA plantations raised in North Goa Territorial Division

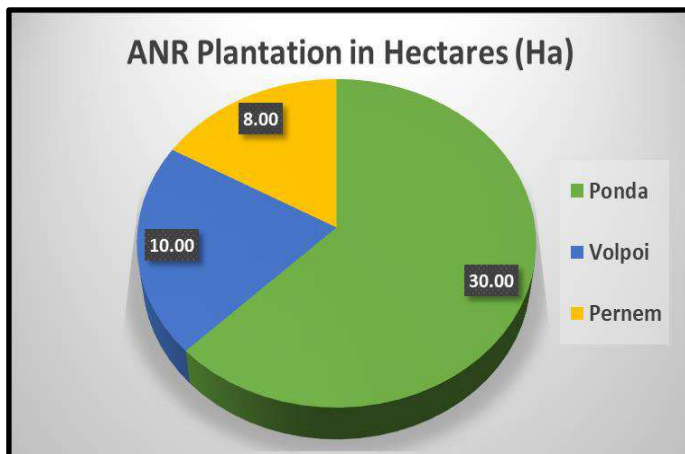


Figure 9: Chart illustrating the total ANR plantations raised in North Goa Territorial Division



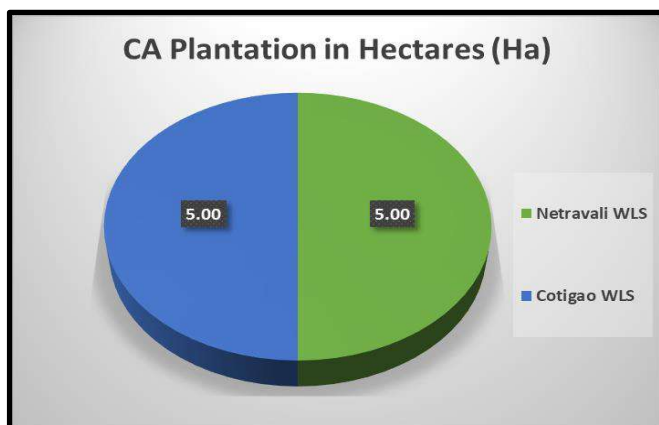


Figure 10: Chart illustrating the total CA plantations raised in South Goa Wildlife Division

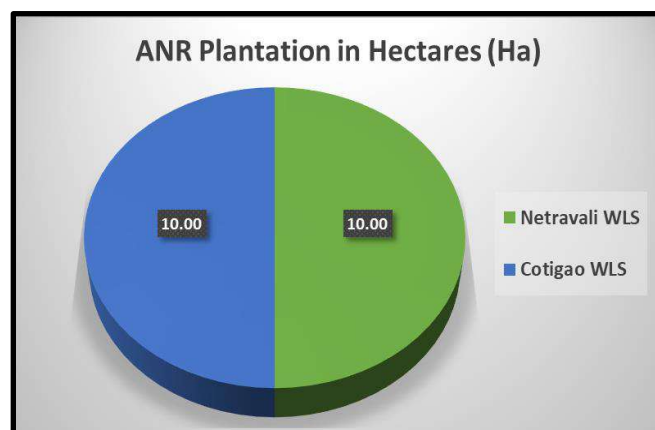


Figure 11: Chart illustrating the total ANR plantations raised in South Goa Wildlife Division

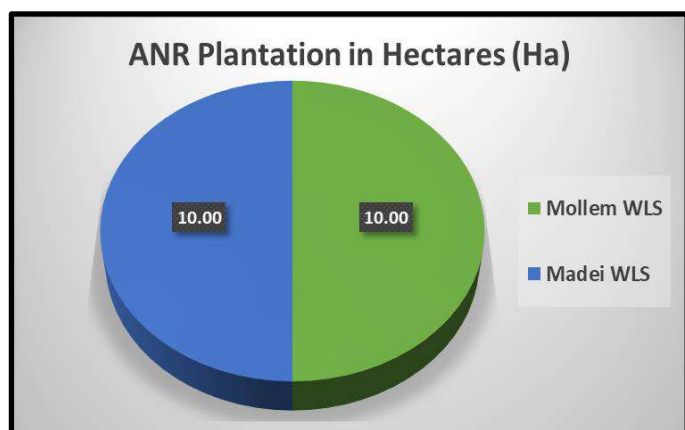


Figure 12: Chart illustrating the total ANR plantations raised in North Goa Wildlife Division

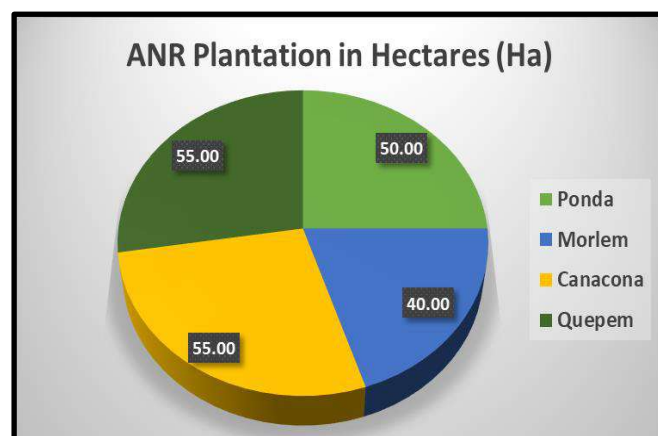


Figure 13: Chart illustrating the total ANR plantations raised in Goa Forest Development Corporation

## Summary

In the fiscal year 2022-23, significant efforts were undertaken across various divisions of Goa to enhance forest cover and biodiversity through extensive plantation activities under the Compensatory Afforestation (CAMPA) and Net Present Value (NPV) schemes.

In the South Goa Territorial Division, 150 hectares of plantations were raised. The survival rate of these plantations ranged from 74% to 83.5%, with an average survival rate of 78.42%.

In the South Goa Wildlife & Ecotourism Division, 30 hectares of plantations were established in Netravali and Cotigao. The survival rate of plants in this division varied from 79.3% to 82%, resulting in an average survival rate of 80.65%.

The North Goa Territorial Division saw the establishment of plantations over 231 hectares under CAMPA 2022-23. The survival rate of these plants ranged from 70.8% to 84.6%, with an average survival rate of 79.66%.

In the North Goa Wildlife & Ecotourism Division, 20 hectares of plantations were raised in Bhagwan Mahavir National Park and Wildlife Sanctuary, Mollem, and Madei Wildlife Sanctuary. The survival rate of plants in this division varied from 73.5% to 77%, with an average survival rate of 75.25%.

The Goa Forest Development Corporation (GFDC), Panaji, raised plantations of over 200 hectares in the Ponda, Morlem, Canacona, and Quepem ranges. The survival rate of these plantations ranged from 74.2% to 80.2%, with an average survival rate of 76.67%.

The plantations primarily featured native multipurpose trees, including fruit-bearing and timber species, designed to support local fauna and forest-dependent communities while enhancing biodiversity conservation. Despite challenges such as wildlife damage from animals like wild boar, porcupine, bison, and deer, the trees generally exhibited robust growth.

Operational planning under Annual Plans of Operations (APOs) tailored to the specific needs of each forest range facilitated the successful execution of seedling raising, plantation establishment, and maintenance activities. NPV activities encompassed natural regeneration promotion, eco-tourism trail creation, fire prevention measures, forest boundary demarcation, chain link protection, and soil moisture conservation through infrastructure like check dams and water ponds.

Structures such as water holes, protection camps, and solar electrification were strategically deployed to enhance forest protection and management efficacy. All activities under CA and NPV components were diligently executed in adherence to approved APOs, ensuring effective maintenance and sustainable forest management practices.

This comprehensive effort underscores Goa's commitment to biodiversity conservation, sustainable forestry practices, and community engagement through strategic afforestation initiatives under CAMPA 2022-23.

## Recommendations

- Provisions should be made for intensive soil work and weeding for at least the first three years of plantation. This will ensure better growth and survival rates of the newly planted trees.
- Ensure maintenance support for at least five years for plantations established in mining and degraded areas. This extended care is crucial for successfully establishing and growing native species in these challenging environments.
- Continue incorporating native species that cater to the needs of the existing fauna and forest-dependent communities in future plantations. Additionally, select new species based on the specific forest types to enhance biodiversity and ecosystem health.
- Promote roadside plantations, especially along highways, with adequate protection measures such as tree guards to enhance survival rates. These plantations not only increase green cover but also provide aesthetic and environmental benefits.
- Increase the deployment of networking towers within forested regions and field stations to improve communication and facilitate effective monitoring of forest activities and conditions.
- Maintain existing chain link fencing and consider extending the number of trenches and fencing to prevent wildlife intrusion in plantation fields. This will protect young plantations from damage by animals.
- Educate nursery staff on the importance of using high-quality seedling material and proper seed-handling processes to ensure the establishment of healthy and robust plantations.
- Address the water requirements of seedlings, particularly in the initial year of plantation, by ensuring monthly watering. This will significantly improve the survival and establishment rates of the young plants.
- Regularly update the knowledge and skills of nursery and field staff through training programs conducted by the research wing or research institutions. Continuous learning will help in adopting best practices and innovative techniques in nursery raising and plantation management.



## GLANCE OF FIELD VISIT

