

CAMPA APO 2019-20

**Third Party External Evaluation
REPORT**

**Goa Forest Department
Government of Goa**

Centre for Environment Education



**CAMPA 2019-20
Third Party External Evaluation
Report**

Goa Forest Department, Government of Goa

Executed by

**Centre for Environment Education
Office of the Old SCERT Building, Alto Porvorim, Bardez Goa 4033521**

Credits:

The Goa Forest Department vide its letter No.6-783/2015-16/Moni/DP/CAMPA/481 dated 22/05/2020 assigned third party external evaluation task to CEE Goa State Office located at Old SCERT building, Alto Porvorim, Bardez Goa 403521.

Project Team

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Evaluation team:

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About CEE

Centre for Environment Education (CEE) was established in August 1984 as a Centre of Excellence supported by the Ministry of Environment and Forests, Government of India. CEE, a national institution with its headquarters in Ahmedabad, has a mandate to promote environmental awareness nationwide. CEE is affiliated to the Nehru Foundation for Development and inherits the rich multi-disciplinary resource base and varied experience of Nehru Foundation for Development. CEE is committed to ensuring that due recognition is given to the role of EE in the promotion of sustainable development. CEE develops innovative programmes and educational material, and builds capacity in the field of education and communication for sustainable development. It undertakes demonstration projects in education, communication and development that endorse attitudes, strategies and technologies that are environmentally sustainable.

Acknowledgment

The study is part of mandatory requirement of external evaluation as per the CAMPA guidelines. We would like to thank the Goa Forest Department for giving us an opportunity to evaluate works related to CAMPA carried out in the year 2019-20.

We would like to specially thank Shri Subhash Chandra IFS, PCCF and Shri Santosh Kumar IFS, APCCF and Chief Wildlife Warden and Shri Saurabh Kumar IFS, CF for their support and guidance during the evaluation.

We would also like to thank DCFs, ACFs and RFOs of all divisions for their support during evaluation. The RFOs and field staff accompanied the field staff to the sites to show various activities proposed have been carried out. Thanks for their cooperation and support.

We would like to specially acknowledge their tireless effort in protecting our natural heritage the forest and wildlife.



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CA	Compensatory Afforestation
CAMPA	Compensatory Afforestation fund Management and Planning Authority
CCT	Continuous Contour Trenches
CEE	Centre for Environment Education
CCF	Chief Conservator of Forests
CF	Conservator of Forests
CPT	Cattle Proof Trenches
CWLW	Chief Wildlife Warden
DCF	Dy. Conservator of Forests
FCA	Forest Conservation Act 1980
IFA	Indian Forest Act 1927
MoEFCC	Ministry of Environment, Forests and Climate Change
NGO	Non-Government Organization
NPV	Net Present Value
PA	Protected Areas
PCCF	Principal Chief Conservator of Forests
RA	Reserve Forest
RFO	Range Forest Officer
RKM	Running Kilo Meters
SCT	Staggered Contour Trenches
SMC	Soil and Moisture Conservation
TERI	The Energy and Resources Institute
WLPA	Wildlife Protection Act 1972
WWF	World Wide Fund for Nature, India

Executive Summary

Centre for Environment Education (CEE), was assigned the task of third-party external evaluation of CAMPA activities carried out in the state during the year 2019-20.

- A. A team of five experts was constituted to undertake field visit and evaluate the works done using the evaluation format.
- B. The expert team involved, Shri Sujeetkumar Dongre, CEE, Shri Ramesh Rathod, Asst. Professor of College of Forestry, Sirsi, Ms. Suvarna Shakyamuni, CEE, Ms. Shubha Hegde, College of Forestry Sirsi, Ms. Manisha Patnekar, College of Forestry, Sirsi, Shri Sidanth KS, CEE
- C. Shri Ramesh Rathod, along with two of his researchers were invited to be the part of evaluation team.
- D. Field visits were carried out over a period of one month. All the DCF's and RFOs were informed about the visit. The team reached respective places based on the communication made with the concerned RFOs.
- E. The evaluation team checked all works physically, took photographs as evidence and discussed the implementation process with the field staff.
- F. The data collected is being used to assess compliance and target achieved as proposed in APO 2019-20.

Evaluation and procedure followed:

CEE has an experience of evaluation of CAMPA activities as an external third party. It has evaluated CAMPA activities of Goa Forest Department activity for the year 2013-14. During that time, a workshop was conducted for RFOs and ACFs of all divisions wherein, various aspects of CAMPA implementations were discussed. Evaluation formats were evolved, which was then used to assess activities carried out during the APO 2013-14. Since the evaluation format was evolved, was effective in assessment, it was in discussion with the Chief Wildlife Warden and DCF Monitoring of Goa Forest Department decided to use the same format for evaluation of CAMPA activities of the year 2019-20 too.

Overall Observations

A few overall observations made on the basis of the evaluation exercise are:

A. COMPENSATORYAFFORESTATION:

- A. The Territorial divisions of North and South Goa undertook CA plantation.
- B. The estimated target to cover was 65.806 Ha area. Out of this, an area of 59 ha has been brought under the CA plantation covering forest areas of Quepem, Collem, Canacona, Pissurnem.
- C. About 20 different species of fruit bearing and wildlife importance have been planted. The saplings were procured from various departmental nurseries raised under CAMPA and state funding.
- D. Overall survival percent observed is about 80%. The department has undertaken gap filling of those saplings dead due to reasons of grazing, inadequate water supply and extreme heat
- E. Wild and indigenous plants have been carefully selected as planting stocks in all locations. The seedlings planted have been raised in the nurseries being managed and raised by the trained staff of the Goa Forest Department
- F. In most of the cases, Reserved Forests were selected for CA plantation. Wherever, there are gaps or fairly open and barren areas are brought under the plantation.
- G. The CA plantation will in long term help increase the green cover of the state.



B. Wildlife and habitat improvement

1. Wildlife divisions, both in South and North carried out various activities leading to better management of park and habitat management.
2. Various activities ranging from up gradation and maintenance of butterfly park in Cotigao wildlife Sanctuary, creation of fire lines (30RKM), creation and maintenance of waterholes (31 numbers), development of watchtowers (one) and development of nature trails (8 number and 17.5 RKM), Gabion structures (8), Check dams (59) have been constructed in Protected areas. The new water holes constructed have been of immense help to the wildlife and habitat improvement. The works undertaken are satisfactory and contributing to the habitat improvement.

- i. 30RKMs of Creation of fire-lines
- ii. 31 numbers of creation and maintenance of Waterholes
- iii. Development of nature trails (8 number and 17.5 RKM)
- iv. Gabion structures (8)
- v. Check dams (59)
- vi. development of watchtowers (one)
- vii. Two patrolling stations in Valpoi range

3. Check dams have in many places helped in moisture conservation. Sites inspected at Mollem, Cotigao, Netravali, Madei and Bondla have shown a good result
4. Nature trails are a good concept. Goa being a tourism destination and tourists preferring to visits hinterlands, nature trails have proved to be a good in terms of accessing forest area to watch birds and other animals in its natural form.



C. Nursery Management and seeding raising

About 200000 seedlings have been raised in nurseries situated at Quepem, Cotigao, Netravali, Keri, Valpoi and Bondla. About 30 species of fruit bearing and wildlife importance have been raised. The seedlings raised have been used for CA plantation, wildlife and habitat management and public distribution. A target of 2 lakh seedlings was envisaged in the APO 2019-20. About 65% stock has been used by the department to carry out CA plantation and other wildlife and habitat improvement related plantation. 30% stock has been distributed among the public and remaining is left in the nurseries. Maintenance of nursery and seedlings is satisfactory.



D. Management of biodiversity and biological resources:

A wonderful facility of Biodiversity Park has been established on the National High Way leading to Belgavi in Dharbandora taluka of South Goa district. This facility has opened a new avenue not only for the tourists, but can be very well utilized for education and research purpose. CAMPA must propose similar facilities in cities. Other activities proposed activities such as Nagar Upavan and Gram Upvans and one more biodiversity park in North District have been accomplished.

Suggestions:

1. Urban Forestry was proposed, but could not be achieved. Goa being a coastal state and there exists Dr. Salim Ali Bird Sanctuary in close proximity to the City of Panjim.
2. Enhancing education and awareness facilities and creating community-based conservation and tourism model would help not only conservation but sustainable harvesting of its potential through ecotourism by involving local communities.

E. Forest Fire prevention and control operation

The south Goa division has undertaken activities of Grass cutting in plantation area of 30 ha and fire tracing on outer side and in between, Fire tracing in 103 ha block by Establishment fire lines & maintaining same every month till the arrival of monsoon to the extent of 30 RKM. The North Goa division has undertaken maintenance of 10 RKM. The Wildlife North Goa too has undertaken 17 RKM of fire tracing, maintenance and establishment of fire lines. The target has been achieved and overall work is satisfactory.

- i. Fire tracing by establishing fire-lines of 103 ha block to the extent of 30 RKM in South Goa Division
- ii. North Goa undertook maintenance of 10 RKM fire lines
- iii. North Goa Wildlife Division established 17 RKM fire lines.



F. Construction & maintenance of residential and official building for frontline staff

Since it is a civil work, evaluation of this activity has not been undertaken.

Suggestion and Recommendations:

1. The ground staff is motivated and committed to the work he/she is involved in. Most of the target given is achieved. With respect to the CA plantation maintenance part is concerned, it is observed that there no provision made under CAMPA to support maintenance cost of CA plantation. It is highly recommended that at least three years of maintenance support be provided to the CA plantation.
2. As regard to identification of areas for constructing check dams and other water conservation measures are concerned, it is highly recommended that identification be done based on watershed concept and not selected randomly.
3. Inter division coordination is must while implementing activities especially related to wildlife and habitat improvement and soil and moisture conservation is concerned.
4. Education, research and training is most important component of forest and wildlife conservation. This component should be made part of wildlife and habitat improvement.
5. Green house or poly-house can be provided to the Nursery to raise good seedlings and also reduce mortalities.
6. Land is a scarce resource in the state of Goa, but the target to bring areas under Forests will keep on increasing. In such a situation, the Department needs to work towards innovative ideas of identifying existing areas requiring additional vegetation cover. The Department may undertake survey of such areas (wherever possible including the PA), identify them based on scientific principles, plot them on a GIS map and produce before the Executive Committee for their consideration and work on this at least for five years to achieve the desired conservation goals. This in initiative is not only desirable but will yield tangible result.
7. The Department must focus on urban forestry which is another important area of concern. The Department must identify open spaces in consultation with the local bodies and convert the min to gardens by planting forestry species. Road sides and traffic islands can be equally potential space for planting forestry species. Premises of educational institutions, public offices, and outskirts of playgrounds and open spaces also have large space that can be brought in use for developing green spaces by plantation of indigenous species. The premises of educational institutions can specially be used for developing botanical gardens in consultation with the heads, teachers and PTA members. This will not only helping increase tree cover in urban areas but also would be of immense educational value. It into further recommend that the Forest Department shall maintain the saplings for a period of three years till they are established. Social Forestry Division

may undertake such activity. In case required, depending on site and the condition, maintenance of species may be allowed even after three years of mandatory maintenance clause. The Concerned DCF may decide after proper field survey and assessment.

8. Currently, under CAMPA, activities such as construction of check dams, sunken ponds, Staggered Continuous Trenches (SCT), Cattle Proof Trenches (CPT) etc are undertaken. Though, these structures are important, they need to be created on the basis of watershed approach with thorough understanding of topography, slope and soil type. Concerned division must ensure that the areas of such importance are identified with watershed approach, plot them on a Geo Information System (GIS) map and implement the activities
9. The Department should identify areas and issues for research and assign the list for short term research studies at the level of graduation and post-graduation. The Department could also arrange for research expenditure to be incurred during the course of research study. It should also ensure that such study after exposure must offer programme of action in clear terms for the concerned and the results are evident and measurable.



CAMPA ACTIVITIES WITH REFERENCE TO APO 2019-20

- a. Activity stipulated: As per the CAMPA guidelines, the Goa Forest Department has constituted Executive and steering Committees. The APO 2019-20 was duly passed by both executive and steering committee for the components related to evaluations areas below:

Components	Physical target
CA Works	
Maintenance of old CA plantations (Sec. 6(a) of CAF, Act)	5.806 Ha
Raising of New CA plantation with protective fencing (Sec. 6(a) of CAF, Act)	40 Ha
Aided Natural Regeneration in degraded forest (Ha) (Sec. 6(a) of CAF, Act)	20 Ha
Development of new Nurseries for CA plantations & enrichment works, densification works (Sec. 6(a) of CAF, Act)	2 Lakhs seedlings
Protection of Forest	
Creation and maintenance of protection camps for frontline staff in various remote locations of forest. (Rule 5(2) d)	8 nos
Forest protection by consolidation of forest boundaries (Rule 5(2)d)	16.1 kms
Cattle proof trench at Bhati beat in Netrawali WLS (Rule 5(2)d)	3.2 km
Rubble Wall fence at Tirwal Beat in Cotigao WLS (Rule 5(2)d)	1.5
Chain link fencing using R.C.C. Poles 3.00 m Intervals at proposed reserve forest Cotigao-II for protection. (Rule 5(2)d)	1 km
Construction of Anti-poaching centers with WC & bath at: Khadrehat, Goa State boundary, Golauli & Satrem (Rule 5(2)d)	4 nos
Construction of Forest Barracks at Cotigao WLS and Netrawali WLS for frontline staffs (Rule 5(2)d)	2 nos
Improvement of Forest Check Posts * (Rule 5(3) d)	5 nos
Raising of seedlings for public distribution (Rule 5(3) j) This work is an ongoing worksundertaken as per MoEF&CC's letter vide F. No. 11-100/2015-FC(Vol.iii) dated 12-06-2019.	5 lakhs
Soil & Moisture Conservation Work in the Forest	
Jal Sakti Abhiyan Soil and Water conservation measures like Ponds, Check dams, bunds etc. to improve water regime of the forest. (Rule 5(2) g)	LS
Forest Fire Prevention and Control Operations	

Fire tracing, establishment and maintenance of fire lines Rule 5(2) f)	5 ha & 17 Rkm
Providing fire protection measures in Block of 103 Ha in sy no. 109 of Rivona village Rule 5(2) f)	
Grass cutting in entire plantation area of 30 ha and fire tracing on outer side and in between	30 Ha
Fire tracing in entire 103 ha block by establishment fire lines & maintaining same every month till the arrival of monsoon (excluding 30ha of plantation)	10 Ha
Engaging fire watcher for 6 months from December 2018 till May 2019, 6 labour per month	LS
Maintenance of Fire Line Rule 5(2) f)	10 RKm
Management of Biological Diversity and Biological Resources	
Development of Two numbers Nagar Van , Gramya Upavan and biodiversity parks in each district Rule 5(2) m)	LS
Raising Roadside Plantation for urban greening Rule 5(2) m)	68 Rkm
Aided natural regeneration on Survey No. 62 & 63 of Rivona Village. Rule 5(2) m)	
Fencing along periphery on 1 side by Rubble wall as it is succceptable to encroachment and it is bounded by road but open to human habitation hence desirable to have permanent boundary.	0.70 Rkm
Chain link fencing along periphery on 3 sides	0.625 Rkm
Digging trenches, weathering & refilling of pits for plantation during 2019-20 by 400 seedlings	400 Nos
Maintenance & tending of natural regeneration by removing weeds, providing soil work	
Creation of Garden around NIC up to Open theatre and chain link fencing for garden at Campal Range. Rule 5(2) m)	LS
Improvement of Wildlife Habitats	
Up gradation of Butterfly Park Cotigao. Rule 5(2) i)	LS
Expansion, Desilting & Strengthening of water reservoir at Bela point in Tirwal beat of CWLS. Rule 5(2) i)	LS
Cattle proof trenches along boundary of the sanctuary to prevent straying if wildlife animal into settlement. Rule 5(2) i)	200 Mtrs
Survey & Boundary demarcation of Bhagwan Mahaveer National Park. Rule 5(2) i)	10 Kms
Creation of water holes by tapping water from fresh water springs in B/M/WL Sanctuary. Rule 5(2) i)	4 Nos.
Maintenance of vasant Bandara at Nandan & Dongurlim beat. Rule 5(2) i)	2 Nos
De-silting of existing water holes in B/M/WL Sanctuary & National	10 Nos

Park. Rule 5(2) i	
Erection of loose rubble check dams. Rule 5(2) i	4 Nos.
Creation of Gabbion check dam. Rule 5(2) i	10 Nos
De-silting of water holes at Bondla Wildlife Sanctuary Rule 5(2) i	2 Nos
Maintenance of Nature trails at Bondla. Rule 5(2) i	7.5 Kms
Laying of staggered trenches at Bondla Wildlife Sanctuary Rule 5(2) i)	2500 Nos
Creation of grass plot at Bondla. Rule 5(2) i	4 Nos.
Renovation of grass plot, pump operated irrigation system, water channel of 100 mtr. And brushwood fencing at Nanoda, Pendral and maintenance of Second year. Rule 5(2) i	3 Ha
Gabion Structures (Madei). Rule 5(2) i	10 Nos.
Staggered Contour Trenches (Madei). Rule 5(2) i	2000 Nos.
Maintenance of existing waterholes (Madei). Rule 5(2) i	10 Nos.
Creation of water holes (Madei). Rule 5(2) i	6 Nos.
Boundary clearance and its maintenance (Madei). Rule 5(2) i	20 RKms
Fire tracing along the traffic roads and village roads (Madei)	20 RKms
View line clearance along the roads (Madei). Rule 5(2) i	22 RKms
Maintenance of nature trails (Madei). Rule 5(2) i	6 Kms
Creation of Nature trails (Madei). Rule 5(2) i	6 Kms
Installation & display of signage's in PAs and adjoining major roads for safety of wildlife crossing * Rule 5(3) c)	
Upgradation of Butterfly Park Cotigao. Rule 5(2) i)	LS
Construction & maintenance of residential and official building for frontline staff	
Construction of Sewerage tank and Repairs of toilet sewerage line* Rule 5(3) e)	1 no
Repair of Parking Shed*Rule 5(3) e)	1 no
Renovation and Repair of pump house* Rule 5(3) e)	1 no
Improvement of forest road at Division office Ponda* Rule 5(3) e)	300 mtr
Improvement of forest road at Range Office Keri* Rule 5(3) e)	100 m
Provision of Garage cum storage room at Keri Range Office* Rule 5(3) e)	1 no
Construction of check post with WC & Bath at Pali, Zamlikhade Chorla Ghat, Nanoda Satrem* Rule 5(3) e)	3 nos
Repair & Upkeep of Nature Interpretation Centre at Eco Tourism Complex, CWLS* Rule 5(3) e)	1 no
Maintenance of Watch Towers*	6 nos
Improvement of road at Tisk Usgao Nursery Ponda* Rule 5(3) e)	100 m

Field observations (Division Wise)

SL. No	Name of the Work	Beat	Remark
Range: Cotigao Wildlife Sanctuary			Date: 27.01.2021
1.	Raising Nursery of 25,000 seedlings	CWLS	11,025 seedlings are in the nursery as stock.
2.	Construction of Water pond	Bela-Tirwal	Size: 25x20m Work has been carried out to the satisfaction
3.	Construction of Water pond	Khargal-Tirwal	Size: Length: 25mX25mx1m Stone pitching work was done. Condition of the pond is good.
4.	Construction of Water pond	Dhantali-Endrem	Size: 29x25m Condition of the pond is good and well maintained.
5.	Dry stone pitching for water pond.	Bela-Tirwal	Done.
6.	Dry stone pitching for water pond.	Khargal-Tirwal	Stone pitching condition was good.
7.	Dry stone pitching for water pond.	Dhantali-Endrem	Stone pitching condition was good. Extra tunnel for the flow of excess water.
8.	Painting of Rescue Snake enclosure	ET complex-CWLS	Paint was done with poor quality. During the inspection, the structure was seen without paint for long
9.	Painting along Nature trail	ET complex-CWLS	Was painted properly
10.	Painting of Amphitheater	ET complex-CWLS	Paint was done with poor quality. During the inspection, the structure was seen without paint for long
11.	Painting of children park	ET complex-CWLS	Paint was done with poor quality. During the inspection, the structure was seen without paint for long
12.	Painting of Foot path and rearing chamber of butterfly park	ET complex-CWLS	Paint was done with poor quality. During the inspection, the structure was seen without paint for long
13.	Painting of compound wall and Massonry linings	ET complex-CWLS	Paint was done with poor quality. During the inspection, the structure was seen without paint for long

Range: Cotigao Wildlife Sanctuary



Snake rescue center



Amphitheater



Nursery of 25,000 seedlings



Construction of Water pond



Water Pond (Size 25mx20m)



**Water Pond
(Size: Length: 25mX25mx1m)**



Butterfly park

Range: Netravali wildlife Sanctuary

Date:28-01-2021

1.	Rising of 25,000 No. by 5x8 H.D.P.E bags Nursery.	Mattoni, Netravali	Used seedlings for public distribution and plantations. Condition of the work is very good.
2.	Construction of water pond	Netravali	The work is done to the satisfaction
3.	Construction of water pond	Cumari	Size: 20mx25mx1m Good Condition and well maintained.
4.	Dry stone pitching for Mattoni water pond	Netravali	Good Condition.
5.	Dry stone pitching for Cumari water pond	Cumari	Good Condition.
6.	Boundary demarcation with Cattle proof trench from Sidha gate to Kanari Sidha temple Valkini col. 3, 1000 meters.	Bhati	All are in good condition.
7.	Boundary demarcation with Cattle proof trench from Sidha Kanari Sidha temple to water culvert Valkini col. 2, 1000 mtrs.	Bhati	All are in good condition.
8.	Boundary demarcation with Cattle proof trench from culvert to water body at Valkini col. 1, 1200 mtrs.	Bhati	All are in good condition.

9.	Work of 20 (No's) installation and display of WL safety and awareness signage's in PA's adjoining major roads.	Netravali	All are in good condition.
10.	Maintenance of wooden watch tower.	Mattoni, Netravali	Wooden tower condition and maintenance is very good and they have kept camera trap at its base.

Range: Netravali wildlife Sanctuary



Netravali Range Nursery

Wooden watch tower



Cattle proof trench

Water pond



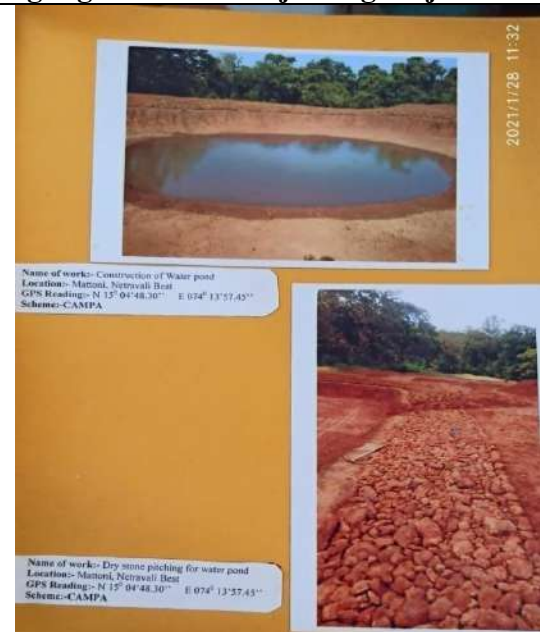
Dry stone pitching for Cumari water pond



Display of WL safety and awareness signage's in PA's adjoining major roads.



Cattle proof trench



Maintenance of work in a file formate

Range: Cancona

Date: 29.01.2021

1.	Raising of 50,000 seedlings for CA plantation.	Cancona	Polybag size:5/8. Stock was used in two plantation sites. <ul style="list-style-type: none"> 1. Boundary plantation.2500 Bamboo seedlings with spacing of 5m*5m 2. Bamboo plantation of 12 ha. Area. 3.Cane Planting of 2.5 ha Seedlings left in nursery :
2.	Raising of 25,000 seedlings for public distribution.	Cancona	Polybag size:5/8 Seedlings left in the nursery:
3.	Construction of mother beds No. 08.	Cancona	Condition:



CA plantation



CA plantation Seedlings



Mother Bed

Range: Bondla Wildlife Sanctuary		Date: 30.01.2021	
1.	Construction of water retaining sunken pond/ water hole of radius 14.50 m and average depth of 1.5 mtrs	Pillem	Good condition.
2.	Rising of 25000 fruit bearing seedlings in 5x8 bags for public distribution.	Conquirem	Nursery was well maintained with good condition. Remaining seedlings:18,784
3.	De-silting of water holes (02 Nos.)	Conquirem	All are good in condition. They have shown 02 water holes out of 06. This work was conducted during November and December. Before it has muddy walls. Now they established stone pitching.
4.	Lying of staggered trenches.	Dharbardora Conquirem Pillem	Size: 3x1x2m Good condition. Total:2500 No's Of distance 3 m Size :3m×2m×1m
5.	Maintenance of Nature trail	Dharbardora Conquirem Pillem Ganjam	Length :7.5 km They split into 3 trail 1. Length of 5 km 2. Length of 1.5 km 3. Length of 1.1 km They made sequence of demarcation with red paint on rod at the interval of 50 m Gps reading matched and all are in good condition.
6.	Fabrication of trap cage for rescue Gaur	Bondla	In good condition.

Range: Bondla Wildlife Sanctuary



Water retaining sunken pond



Fruit bearing seedlings



De-silting of water holes



Trap cage for rescue OF Gaur



Boundary Line



Maintenance of Nature trail

Range: Pissonem South Goa Division		Date:03-02-2021	
1.	Work of CA Plantation with protective fencing for an area of 20 ha.	Survey no.12/0 of padi village	Spacing=4m×4m Total plants=12,500 Fencing perimeter=2.4 km
2.	Engaging the fire watchers in fire prone government forest area under jurisdiction of Pissonem range		Done.
3.	Consolidation of forest boundary for survey and demarcation to a width of 5m and repairing of cairns of government forest area	Survey no.39 of Tilloi village	Length of 5.5 km Total No's=10 Distance from one to other =500mtr

***Survival percent**

Total plots=5

Size of the plot=20mx20m

In one plot =5 row, 5 columns

Total plants in a plot =25

1. In 1st plot 21 plants
2. In 2nd plot 23 plants
3. In 3rd plot 19 plants
4. In 4th plot 15 plants
5. In 5th plot 17 plants

Average = $21+23+19+15+17 \div 5 = 19$

Percent of Survival= $\frac{19 \times 100}{25} = 76\%$



CA Plantation



Forest boundary for survey and demarcation

Range: Collem			Date:09-02-2021
01.	CAMPA Mix plantation Sy. No.16 at Mollem Village with protective fencing (Bio diversity park)	Mollem village	Area=6.5 ha Spacing=2.5m Total plantings=10,400
02.	CAMPA Mix Plantation (Sy.No.34) with protective fencing	Zamblimol in Collem village	Area=5.5 ha Spacing=2.5m Total plantings=8,800 This is cyclone prone area and in month of June 2020 they made Gap fillings
03.	CAMPA aided natural regeneration in degraded plantation in Sy.No.34 of Zamblimol, Collem Village	Zamblimol in Collem village	Area =4 ha Planted 640 plantings in the gaps of forest area
04.	CAMPA aided natural regeneration in degraded plantation (Bio diversity park)	Sy.No.16 of Mollem village	Area=6 ha Spacing=2.5m Total plantings=960 For public as well as Plantations and other ranges plantations
05.	Maintenance of 1 Year old CA Plantation	Aglote	Area=2 ha Spacing=2.5m Total plantings=2,960
06.	Raising of 10000 Nos of Medicinal seedlings	Dharbandora Nursery	Remaining seedlings=2,382 Polybag size=8×12 For public as well as Plantations and other ranges plantations
07.	Raising of 20000 Nos of Mix Medicinal seedlings	Dharbandora Nursery	Balance=4,684 Polybag size=8×12 For public as well as Plantations and other ranges plantations
08.	Raising of 10000 Nos of Canes seedlings	Dharbandora Nursery	Balance=420 For public as well as Plantations and other ranges plantations
09.	Laying of crab grass at reception area at bio diversity park	Bio-diversity park, Mollem	Area=4,900 sq.m. Well established. looking aesthetic
10.	Eradication of Eupatorium at Biodiversity park	Sy.No.16 of biodiversity park, Mollem village	Area =1 ha
11.	Rubble wall fencing at Bondumol	Bondumol, Mollem	Length=150 mtr.

Range: Collem



Mix Plantation (Sy.No.34) with protective fencing



Natural regeneration in degraded plantation (Bio diversity park)



Raising of 10000 No's of Medicinal seedlings



Eradication of Eupatorium at Biodiversity park



Rubble wall fencing at Bondumol



CA Plantation



Crab grass at reception area at bio diversity park



CA Plantation

Range: Mollem wildlife sanctuary			Date:10-02-2021
1.	Creation of waterhole near grass plot	Nandran beat	Water holding capacity is good
2.	Fire watcher	Mollem round	-
3.	Fire watcher	Kayal round	-
4.	Fire watcher	Kayal round	-
5.	Fire watcher	Collem round	-
6.	Creation of water retaining structure	Mollem round	In good condition
7.	Construction of dry stone /loose bolder check dam (4 No's)	Nandran	All 4 are good in condition. GPS matched. Specification:
8.	De silting of waterhole	Kaskomd in mollem beat	Work happened to the satisfaction
9.	Maintenance of government forest boundary	Kaskomd in mollem beat	Good in condition. Length:2 km
10.	Construction of dry stone /loose bolder check dam (4 No's)	Collem l&l Beat	Specification not ascertained

11.	Construction of dry stone /loose bolder check dam (4 No's)	Dongurlim beat at kayal round	Specification not ascertained
12.	Construction of dry stone /loose bolder check dam (4 No's)	Shigoa beat of kayal round	Specification not ascertained
13.	De silting of waterhole	Dongurlim beat at kayal round	Done
14.	De silting of waterhole	Dongurlim beat at kayal round	Done
15.	De silting of waterhole	Shigoa beat of kayal round	Done
16.	De silting of waterhole	Karemol beat of kayal round	Done
17.	De silting of waterhole	Oxel beat of Kayal round	Done
18.	Work of Boundary demarcation with cattle proof trenches	Surla-l beat of mollem round	Length: 200mtr.
19.	Construction of loose boulders check dam	Caranzol beat of caranzol round	Accomplished to the satisfaction
20.	Construction of dry stone/loose boulder check dam (4 No's)	Karemol beat of kayal round	Accomplished to the satisfaction
21.	Maintenance of government forest boundary	Oxel beat of kayal round	Length:8km
22.	Maintenance of government forest boundary	Gawliwada pokarmol of kayal beat	Length:8km
23.	Construction of dry stone/loose boulder check dam (2 No's)	Kayal round	Accomplished to the satisfaction Good in Condition. Specification could not be ascertained
24.	Construction of dry stone/loose boulder check dam (4 No's)	Dongurlim beat at kayal round	Specification could not be ascertained
25.	Construction of dry stone/loose boulder check dam (2 No's)	Shigoa beat at kayal round	Accomplished to the satisfaction Good in Condition. Specification could not be ascertained

26.	Construction of dry stone/loose boulder gabion check dam (3 No's)	Kaskond beat of mollem round	Accomplished to the satisfaction Good in Condition. Specification could not be ascertained
27.	Construction of dry stone/loose boulder check dam (2 No's)	Surla-1 beat of Mollem round	Accomplished to the satisfaction Good in Condition. Specification could not be ascertained

Range: Mollem wildlife sanctuary



De silting of waterhole



Water retaining structure



De silting of waterhole



Maintenance of government forest boundary



Maintenance of government forest boundary



Dry stone/loose boulder check dam



Dry stone /loose bolder check dam



Dry stone /loose bolder check dam

Range: Madei wildlife sanctuary			Date:11-02-2021
1.	Work of creation of Nature trail of 2 km	Surla beat in Charaundem round	-
2.	Maintenance of Grass plot of 1 hac	Nanoda beat in codal round	Work could not be seen to assess.
3.	Work of staggered counter trenches (200 No's)	Surla beat in Charaundem round	Done.
4.	Work of staggered counter trenches (400 No's)	Codal beat in codal round	Accomplished to the satisfaction.
5.	Work of De-silting & Maintenance of Waterhole	Golauli at Ivrem beat in Charaundem round	Good in condition. Little amount of water is there.
6.	Maintenance of waterhole	Golauli at Ivrem beat in Charaundem round	Good in condition. Accomplished to the satisfaction
7.	Work of de-silting & Maintenance of waterhole	Codal beat in Codal round	-
8.	Work of creation of waterhole	Golauli at Ivrem beat in Charaundem round	Good in condition.
9.	Work of creation of waterhole	Satrem beat in Codal round	Have been carried out.
10.	Work of creation of waterhole	Surla beat in Charaundem round	Has been carried out.
11.	Work of maintenance of Nature trail of 1km	Nanoda beat in Codal round	Good in Condition Specification: 1km length. 5 mtr width. Demarcation was made by painted stones with white colour.
12.	Work of maintenance of Nature trail of 1km	Surla beat in Charaundem round	It has been maintained properly
13.	Work of creation of Nature trail 2km	Ivrem beat in charaundem round	Good in condition. Specification: 2km length. 5 mtr width. Demarcation was made by painted stones with white color
14.	Work of creation of Nature trail 1.5km	Assodem beat in Caranzol round	Accomplished to the satisfaction
15.	Work of creation of view line	Satrem beat in Coadal round	Accomplished to the satisfaction

16.	Work of creation of view line	Codal beat in codal round	Accomplished to the satisfaction
17.	Work of creation of view line	Codal beat in codal round	Accomplished to the satisfaction
18.	Work of maintenance government boundary	Assodem beat in caranzol round	Accomplished to the satisfaction
19.	Work of maintenance of nature trail 500mtrs	Codal beat in codal round	Accomplished to the satisfaction
20.	Work of construction of Gabbion check dam	Pali beat in charaundem round	Specification could not be ascertained Good in condition.
21.	Work of construction of Gabbion check dam	Derodem beat in Codal round	Carried out the work to the satisfaction. Structures are in good condition
22.	Work of construction of Gabbion check dam	Ivrem beat in Charaundem round	Carried out the work to the satisfaction. Structures are in good condition
23.	Work of construction of Gabbion check dam	Codval beat in Codal round	Carried out the work to the satisfaction. Structures are in good condition
24.	Work of construction of Gabbion check dam	Codval beat in Codal round	Carried out the work to the satisfaction. Structures are in good condition
25.	Work of construction of Gabbion check dam	Derodem beat in Codal round	Carried out the work to the satisfaction. Structures are in good condition
26.	Work of construction of Gabbion check dam	Pali beat in Charaundem round	Carried out the work to the satisfaction. Structures are in good condition
27.	Work of construction of Gabbion check dam	Ivrem beat in Charaundem round	Specifications could not be ascertained. Carried out the work to the satisfaction. Structures are in good condition
28.	Work of Maintenance of fire lines of 1km	Derodem beat in Codal round	Length:1km Width:2m
29.	Work of Maintenance of fire lines of 1km	Codal beat in Codal round	Work has been carried out to the satisfaction
30.	Work of Maintenance of fire lines of 1km	Codal beat in Codal round	Work has been carried out to the satisfaction
31.	Work of Maintenance of fire lines of 2km	Nanoda beat in Codal round	Length:2km

			Width:2m. Works has been carried out
32.	Work of Maintenance of fire lines of 2km	Assodem beat in Caranzol Round	Work has been carried out to the satisfaction
33.	Work of Maintenance of fire lines of 2km	Assodem beat in Caranzol Round	Work has been carried out to the satisfaction
34.	Work of Maintenance of fire lines of 3km	Golauli in Ivrem beat in Charaundem Round	Length:3km Width:2m
35.	Work of Maintenance of fire lines of 3km	Gululem beat in Charaundem round	Maintained properly
36.	Work of Maintenance of Government boundary 5km	Ivrem beat in Charaundem Round	Length:5km Starting point
37.	Work of Maintenance of Government boundary 5km	Pali beat in Charaundem Round	Middle point
38.	Work of Maintenance of Government boundary 5km	Ivrem beat in Charaundem round	Length:5km Ending point
39.	Work of Maintenance of View line 1.5km	Gulelum beat in Charaundem Round	Has been carried out but requires proper maintenance
40.	Work of Creation View Line	Surla beat in Charaundem Round	requires proper maintenance
41.	Work of creation of Nature trail 2km	Satrem beat in codal Round	The nature trail has been created. Need proper maintenance

Range: Madei wildlife sactury



Latitude: 15°38'33"
Longitude: 74°54'6"
Elevation: 296.25 m
Accuracy: 6.8 m
Time: 12/02/2021 13:40
Note: water hole at golauli river mouth

Maintenance of Grass plot of 1 ha



De-silting & Maintenance of Waterhole



Maintenance of Nature trail



Gabbion check dam







Government boundary



Nature trail



Gabbion check dam	Gabbion check dam
	
Work of creation of Nature trail 2km	Maintenance of Nature trail

Range: Bhironda		Date:12-02-2021	
1.	Renovation and repairs of pump house	Soil conservation division	Gps matched. Work has been carried out to the satisfaction
2.	Construction of water retaining Sunken pond/water hole	Maloli	Size=25m×10m×2m In good condition
3.	Construction of water retaining Sunken pond/water hole	Malpan	Size=27m×9m×2m In good condition
			
Water retaining Sunken pond		Water retaining Sunken pond	

Sl. No	Name of Work	Beat	Remark
Range: Quepem			Date: 11/02/2021
1.	Raising a nursery of 50,000 seedlings for CA plantation.	Bendurdem	HDPE polybag size 5*8: 40,000 no's originally planted HDPE polybag size 8*12: 10,000 no's originally planted Mixed plantation
2.	Raising a nursery of 40,000 seedlings for Public Distribution.	Bendurdem	HDPE polybag size 5*8: 30,000 no's originally planted HDPE polybag size 8*12: 10,000 no's originally planted Mixed Plantation Only 18,000nos remaining from the total 90,000 planted for both CA plantation and Public distribution purposes.
3.	Maintenance of fireline	Bendurdem	Length: 5Rkms Width: Greater than 2m
4.	Grass cutting	Keri	Area: 30Ha Tall grasses sufficiently cut to prevent spread of fire.
5.	Maintenance of fireline in Govt. forest	Keri	Length: 10 Rkms Width: Greater than 2m
6.	Fire watcher	Keri	1 no. Well aware of area and well informed
7.	Construction of rubble boundary wall	Rivorna	Length: 0.7Rkms GPS readings of start and end points taken.
8.	Chain link fence using RCC poles	Rivorna	Only supply of chain links has been received and poles have been erected but fencing will be completed in coming financial year.

Overall Observations and comments

CA plantation:

The Territorial divisions of North and South Goa undertook CA plantation. The estimated target to cover was 65.806 Ha area. Out of this, an area of 59 ha has been brought under the CA plantation covering forest areas of Quepem, Collem, Canacona, Pissurnem. About 20 different species of fruit bearing and wildlife importance have been planted. The saplings were procured from various departmental nurseries raised under CAMPA and state funding. Overall survival percent observed is about 80%. The department has undertaken gap filling of those saplings dead due to reasons of grazing, inadequate water supply and extreme heat.

Nursery Management and seeding raising:

About 200000 seedlings have been raised in nurseries situated at Quepem, Cotigao, Netravali, Keri, Valpoi and Bondla. About 30 species of fruit bearing and wildlife importance have been raised. The seedlings raised have been used for CA plantation, wildlife and habitat management and public distribution. A target of 2 lakh seedlings was envisaged in the APO 2019-20. About 65% stock has been used by the department to carry out CA plantation and other wildlife and habitat improvement related plantation. 30% stock has been distributed among the public and remaining is left in the nurseries. Maintenance of nursery and seedlings is satisfactory.

Wildlife and habitat Improvement:

Various activities ranging from upgradation and maintenance of butterfly park in Cotigao wildlife Sanctuary, creation of fire lines (30RKM), creation and maintenance of waterholes (31 numbers), development of watchtowers (one) and development of nature trails (8 number and 17.5 RKM), Gabion structures (8), Check dams (59) have been constructed in Protected areas. The new water holes constructed have been of immense help to the wildlife and habitat improvement. The works undertaken are satisfactory and contributing to the habitat improvement.

Management of biodiversity and biological resources:

The Biodiversity Park in Dharbandora is a good initiative and developed scientifically. The Park help in promoting eco-tourism and environmental education. Many such activities were planned but could not be accomplished during the period APO 2019-20.

Forest Fire prevention and control operation:

The south Goa division has undertaken activities of Grass cutting in plantation area of 30 ha and fire tracing on outer side and in between, Fire tracing in 103 ha block by establishment fire lines & maintaining same every month till the arrival of monsoon to the extent of 30 RKM. The North Goa division has undertaken maintenance of 10 RKM. The Wildlife North Goa too has undertaken 17 RKM of fire tracing, maintenance and establishment of fire lines. The target has been achieved and overall work is satisfactory.

Construction & maintenance of residential and official building for frontline staff:

Since it is a civil work, evaluation of this activity has not been undertaken.

Recommendations for improvement

1. The activities planned have been by and large carried out in a stipulated time bound manner. CA plantations can also be carried out in areas other than the Reserve Forests and Protected Areas. The department may contact various educational institutions including the Government Office campuses where ever there is space availability
2. Provide land owners may also be roped in for plantation purpose
3. The ground staff is motivated and committed to the work he/she is involved in. Most of the targets given are achieved. With respect to the CA plantation maintenance part is concerned, it is observed that there no provision made under CAMPA to support maintenance cost of CA plantation. It is highly recommended that at least three years of maintenance support be provided to the CA plantation.
4. As regard to identification of areas for constructing check dams and other water conservation measures are concerned, it is highly recommended that identification be done based on watershed concept and not selected randomly.
5. Inter division coordination is must while implementing activities especially related to wildlife and habitat improvement and soil and moisture conservation is concerned.
6. Education, research and training is most important component of forest and wildlife conservation. This component should be made part of wildlife and habitat improvement.
7. Green house or poly-house can be provided to the Nursery to raise good seedlings and also reduce mortalities.



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