Sipna Shikshan Prasarak Mandal, Amravati's

ARTS, SCIENCE AND COMMERCE COLLEGE

CHIKHALDARA, DISTT. AMRAVATI (Maharashtra State)

CRITERION – VII

7.1 Institutional Values and Social Responsibilities

7.1.2

The Institution has facilities and initiatives for

1. Alternate sources of energy and energy conservation measures

2.Management of the various types of degradable and nondegradable waste

3.Water conservation

4.Green campus initiatives

5.Disabled-friendly, barrier free environment

- President
  Shri. Jagdish M. Gupta
  (Ex. Minster of State, Maharashtra)
  0721 (O)2522341 (R) 2572526
- Principal
  Dr. Rajesh S. Jaipurkar
  (Mob.) 9423126066

SIPNA SHIKSHAN PRASARAK MANDAL'S AMRAVATI

ARTS, SCIENCE & COMMERCE COLLEGE, CHIKHALDARA

Distt. Amravati (Maharashtra) 444 807

NAAC Reaccredited 3rd Cycle with CGPA 2.77 at grade B++ (2018-2023)

E-mail : ascc163@sgbau.ac.in ■ Website : www.sipnaascc.ac.in ■ Tel. (O) 07220-230309

Outward No : ASCC/Ceat./248/2023 Date : 23/05/2023

DECLARATION

This is to declare that the information, photos, reports, true copies, numerical data, etc. furnished in this file as supporting documents is verified by IQAC and found correct.

Dr. V.D. Kapse
IQAC Coordinator

Co-ordinator
IQAC
Arts,Science & Commerce College,
Chikhaldara
Distt.: Amravati(M.S.)

Dr. R.S. Jaipurkar
Principal

PRINCIPAL
Art, Science & Commerce
College, Chikhaldara

Arts,Science & Commerce College Chikhaldara

Sipna Shikshan Prasarak Mandal, Amravati's

ARTS, SCIENCE AND COMMERCE, COLLEGE

CHIKHALDARA, DISTT. AMRAVATI (Maharashtra State)

SUPPORTING DOCUMENTS

Sipna Shikshan Prasarak Mandal, Amravati's

ARTS, SCIENCE AND COMMERCE COLLEGE

CHIKHALDARA, DISTT. AMRAVATI (Maharashtra State)

Metric No. 7.1.2

-I N D E X-

Circulars and Reports of the Activities for the Implementation of the Initiatives Document

▪ President
Shri. Jagdish M. Gupta
(Ex. Minster of State, Maharashtra)
☎ 0721 (O)2522341 (R) 2572526

▪ Principal (I/C)
Dr. Vasudeo R Patil
(Mob.) 09423610313

SIPNA SHIKSHAN PRASARAK MANDAL'S AMRAVAT
ARTS, SCIENCE &
COMMERCE COLLEGE, CHIKHALDARA
Distt. Amravati (Maharashtra) 444 807
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E-mail : ascc163@sgbau.ac.in ■ Website : www.sipnaascc.ac.in ■ Tel. (O) 07220-230309 ■ Fax 07220-230409

Outward No : ASCC/R.S./49 A /20 Date : 25.01.2020

To,

The Chief Officer Municipal Council,
Chikhaldara.

Subject:- "Regarding Solid Garbage Collection"

Respected Sir,

With reference above cited subject, solid waste collected during regular cleaning in our college campus is collected in the college waste bin. For proper disposal, your municipal council's waste collection vehicle should be regularly sent to the college, which will enable solid waste management to be done properly, as well as keep the college and town clean. Please help improve this article or section by expanding it.

Thanking you

Yours

Acting Principal
Art,Science & Commerce College,
Chikhaldara,Dist.Amravati

Sipna Shikshan Prasarak Mandal, Amravati's

Arts, Science & Commerce College, Chikhaldara, Distt. Amravati

Department of Industrial Chemistry
2021-2022

Name of the activity: -"Solid, Liquid and E-waste management"

Objective:

- **To introduce and aware students to real concerns of environment and its sustainability**
- **To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.**
- **To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.**
- **Composting and proper treatment to waste are the methods adopted by the institute.**

Solid waste management:

- To reduce waste at institute, students and staff are educated on proper waste management practices through on notice boards, displaying slogan boards in the campus.
- Waste is collected on a daily basis from various sources and is separated as dry and wet waste.
- Dustbins are used for solid waste.
- Daily garbage is collected by housekeeping personnel and handed over to authorized personnel of Municipal Council, Chikhaldarafor further processing. All waste water lines from toilets; bathrooms etc. are connected with drainage mains. Waste material like plastic, papers etc. are collected and sold out to scrap vendor from time to time.
- Efforts have taken to produce compost manure from the green solid waste and waste from other sources and efficiently run by the students. Manure is used for the purpose of herbal garden as well or for planted tree.

A. F. Bobade
Asst. Professor & H.O.D [Industrial Chemistry]
Arts,Science & Commerce College,
Chikhaldara

Arts, Science & Commerce College, Chikhaldara

Acting Principal
Art,Science & Commerce College,
Chikhaldara,Dist.Amravati

Liquid waste management:

- The waste chemicals mixed water from laboratory passes through concealed pipe line into soak pit.
- Chemical liquid waste are diluted by lime treatment or equalisation of acid and base.Washroom and toilet liquid wastes in to the common drainage.

E-waste management

- The E-waste collected is stored in store room and disposed every year accordingly.
- Empty toners, cartridges, outdated computers and electronic items are sold as scrap to ensure their safe recycling.
- Printer, monitors and CPUs are repaired as per requirement under Annual maintenancecommittee(AMC).

Asst Professor & H.O.D Industrial Chemistry
Arts,Science & Commerce College
Chikhaldara

Acting Principal
Art,Science & Commerce College,
Chikhaldara,Dist.Amravati

Arts, Science & Commerce College, Chikhaldara

Report

Extension Activity

2017-2018

Title of programmee conducted	:	Rainwater Harvesting
Date of programmee	:	Throughout year
Objectives of programmee	:	
1.	:	Awareness in the society
2.	:	Suggestion and guidance for construction of the water harvesting structures
Number of beneficiaries	:	Approximate 1080 houses.
Brief summary of the programme	:	The rainwater harvesting activity was carried out under the 'Swachha Bharat Swasth Bharat Abhiyan and as a departmental extension activity during academic session 2017-2018. During this session, the rainwater harvesting activity was carried out under the two main themes viz.,

1) Construction of rainwater harvesting structure
2) Awareness in the society

Rainwater harvesting structure was constructed by the B.Sc. II students in his own house/rent house. The total eight structures were constructed.

The door to door and person to person awareness campaign was carried out by the B.Sc. III students in the Chikhaldara and surrounding villages. The total 1080 houses were visited by the students during this campaign.

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Dr. R.S. Mankar
Asst.Professor (Geology)
Arts,Science & Commerce College
Chikhaldara

GLIMPSES OF THE ACTIVITY

CONSTRUCTED STRUCTURE AT CHIKHALDARA


DOOR TO DOOR AND PERSON TO PERSON CAMPAIGN AT VARIOUS VILLAGES














Arts, Science & Commerce College, Chikhaldara

Report

Extension Activity

2018-2019

Title of programmee conducted	:	Rainwater Harvesting
Date of programmee	:	Throughout year
Objectives of programmee	:	
1.	:	Awareness in the society
2.	:	Suggestion and guidance for construction of the water harvesting structures
Number of beneficiaries	:	Approximate 580 houses.
Brief summary of the programme	:	The rainwater harvesting activity was carried out under the 'Swachh Bharat Swasth Bharat Abhiyan and as a departmental extension activity during academic session 2018-2019. During this session, the rainwater harvesting activity was carried out under the main themes viz., Awareness in the society. The door to door and person to person awareness campaign was carried out by the B.Sc. III students in the Chikhaldara and surrounding villages. Total 580 houses were visited by the students during this campaign

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Dr. R.S. Mankar
Asst.Professor (Geology)
Arts,Science & Commerce College
Chikhaldara

GLIMPSES OF THE ACTIVITY

DOOR TO DOOR AND PERSON TO PERSON CAMPAIGN AT VARIOUS VILLAGES








Arts, Science & Commerce College, Chikhaldara

Report

Extension Activity

2019-2020

Title of programmee conducted	:	Rainwater Harvesting
Date of programmee	:	Throughout year
Objectives of programmee	:	
1.	:	Awareness in the society
2.	:	Suggestion and guidance for construction of the water harvesting structures
Number of beneficiaries	:	Approximate 780 houses.
Brief summary of the programme	:	The rainwater harvesting activity was carried out under the 'Swachh Bharat Swasth Bharat Abhiyan and as a departmental extension activity during academic session 2019-2020. During this session, the rainwater harvesting activity was carried out under the main themes viz., Awareness in the society. The door to door and person to person awareness campaign was carried out by the B.Sc. III students in the Chikhaldara and surrounding villages. The total 780 houses were visited by the students during this campaign

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Dr. R.S. Mankar
Asst.Professor (Geology)
Arts,Science & Commerce College
Chikhaldara

GLIMPSES OF THE ACTIVITY

DOOR TO DOOR AND PERSON TO PERSON CAMPAIGN AT VARIOUS VILLAGES








Arts, Science & Commerce College, Chikhaldara

Report

Extension Activity

2020-2021

Title of programmee conducted	:	Rainwater Harvesting
Date of programmee	:	Throughout year
Objectives of programmee	:	
1.	:	Awareness in the society
2.	:	Suggestion and guidance for construction of the water harvesting structures
Number of beneficiaries	:	Approximate 194.
Brief summary of the programme	:	The rainwater harvesting activity was carried out under the 'Swachh Bharat Swasth Bharat Abhiyan and as a departmental extension activity during academic session 2020-2021. During this session, the rainwater harvesting activity was carried out under the main themes viz., Awareness in the society. Due to pandemic situation, the online awareness program has been conducted on 22th March 2021 on the eve of world water day. The online program conducted through the Google form. The total 194 participant participated in this program throughout Maharashtra.
Program Link	:	https://forms.gle/smd1CfCaHGaq47MG7

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Dr. R.S. Mankar
Asst.Professor (Geology)
Arts,Science & Commerce College
Chikhaldara

Arts, Science & Commerce College, Chikhaldara

Report

Extension Activity
2021-2022

Title of programmee conducted	:	Rainwater Harvesting
Date of programmee	:	Throughout year
Objectives of programmee	:	
1.	:	Awareness in the society
2.	:	Suggestion and guidance for construction of the water harvesting structures
Number of beneficiaries	:	Approximate 600.
Brief summary of the programme	:	The rainwater harvesting activity was carried out under the 'Swachh Bharat Swasth Bharat Abhiyan and as a departmental extension activity during academic session 2021-2022. During this session, the rainwater harvesting activity was carried out under the main themes viz., Awareness in the society. Due to pandemic situation, the online and Door Door campaigning awareness program has been conducted during August to December 2021. The online program conducted through the Google form. The total 600 houses were visited by the students during this campaign.

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Dr. R.S. Mankar
Asst. Professor (Botany)
Arts, Science & Commerce College
Chikhaldara

GLIMPSES OF THE ACTIVITY

DOOR TO DOOR AND PERSON TO PERSON CAMPAIGN AT VARIOUS VILLAGES

Arts, Science & Commerce College, Chikhaldara
Department of Chemistry
Extension Activity
Academic Year- 2021-22
Title of the Activity: Plastic Free Environment

Date / period: 13th May 2022
Venue: Seminar hall
Objectives of program: To aware about polythene plastic bag pollution.

Making our environment an eco-friendly zone.

Brief Report: Plastics do not undergo degradation, stay in the soil for many years, which affects soil fertility and degrades the soil quality. When plastic enter the drainage and sewerage system, they block the pipes and the drains causing waterlogging. The improperly disposed of food bags, when eaten by animals, cause stomach and intestine related diseases which even lead to suffocation and death. Plastic items find their way to the river and other water bodies, which are then swallowed by fish, seabirds, and other marine species. The waste from the plastic manufacturing industry is thrown directly into the water bodies, thus affecting the chemical property of water, causing hazards on a very large scale. Proper disposal and usage of plastic discards can reduce these problems. A set of regulations should necessarily be followed to stop these problems. There are primarily three ways of managing plastics: • Reduce • Reuse • Recycle

In the academic session 2021-22 Department organized Extension Activity, in which we aware our students about plastic pollution and asked them about reuse of plastic bottles for planting the plant. The duration of this activity was three months. Students planted the sapling in plastic bottle, observe them by taking care and after grown they submitted it on the date they asked.

The program conducted on 13th May 2022 under the presidency of Honble Principal Dr. R. S. Jaipurkar. Dr. U. S. Wasnik in her speech gave brief introduction about the Extension activity of the department. Dr. R. S. Jaipurkar sir addressed the students and insist students to avoid use of single use plastic. The program ended by vote of thanks.

Dr. D.S. Hedaoo and students of Chemistry were present for the program.

Number of beneficiaries : 52

Feedback link: https://forms.gle/7dSAjqJg96c4vqUt8

DR. U. S. WASNIK
Asst. Professor & Head, M.D. (Chemistry)
Arts, Science & Comm. College
Chikhaldara

Commerce Collage • Arts,Science & • Chikhaldara

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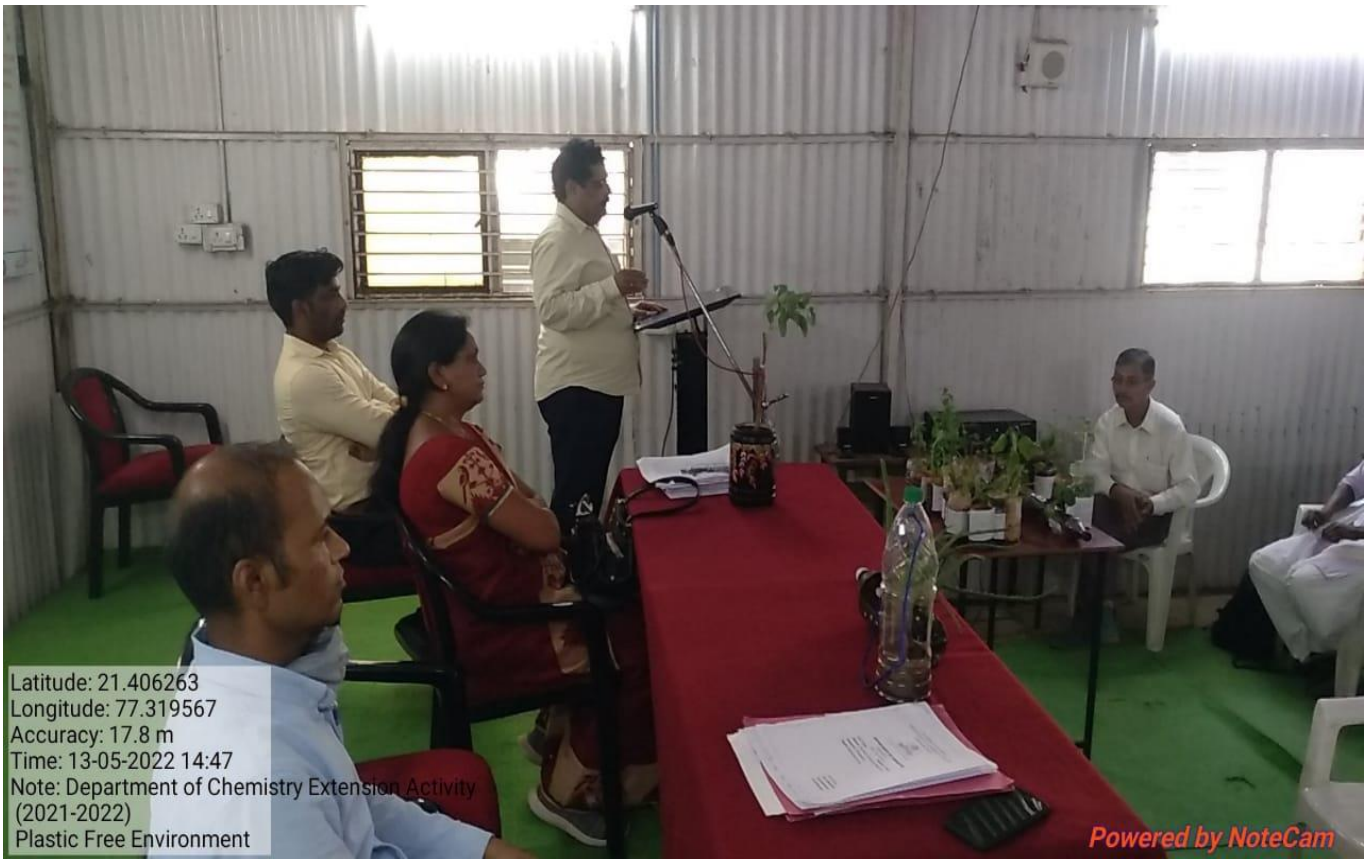
College, Chikhaldara

Dr. U.S. Wasnik, HOD , gave brief introduction about the Extension activity of the department



Hon'ble Principal Dr. R. S. Jaipurkar sir addressed to the students

Students of Chemistry

GROUP PHOTO WITH SAPLINGS

Report of the Activity
2020-21
Extension Activity: Plastic Free Environment

Title: Awareness about plastic bags pollution

Date : 28th August 2021

Venue: Online Google Platform

Objectives of program : To aware about polythene plastic bag pollution

Brief summary of the program: In the academic session 2020-21 due to COVID-19 Pandemic situation extension activity program conducted on online google platform dated 28th August 2021, Saturday at 2.00 pm.

Dr. Usha S. Wasnik shared ppt and focused on how plastic polythene bags create pollution.

Speaker highlighted that the pollution in environment is very big problem for human beings as well as animals, birds and sea creatures also. Human activities cause plastic pollution and is one of the most pressing environmental issue.

Madam in her speech advised to avoid single use plastic, if you go for shopping remember to take a cloth bag.

Dr. D.S. Hedaoo anchored the programme and ended by vote of thanks given by Mr. Rahul P. Rahate

Number of beneficiaries : 14

Link :- https://meet.google.com/rbd-tvno-kzd

Head
Deptt. of Chemistry
Arts,Science & Comm.College
Chikhaldara

Arts,Science & Commerce College Chikhaldara

Acting Principal
Art,Science & Commerce College,
Chikhaldara,Dist.Amravati

Sipna Shikshan Prasarak Mandal, Amravati

Arts, Science & Commerce College, Chikhaldara Distt. Amravati

Department Of Chemistry

3 rd Cycle CGPA 2.77

Department of Chemistry
Extension Activity-
2020-21

" Plastic Free Environment"

Organize Lecture On

Awareness About Plastic Bags Pollution

Date :- 28th August 2021,

Saturday at 2.00 pm onwards

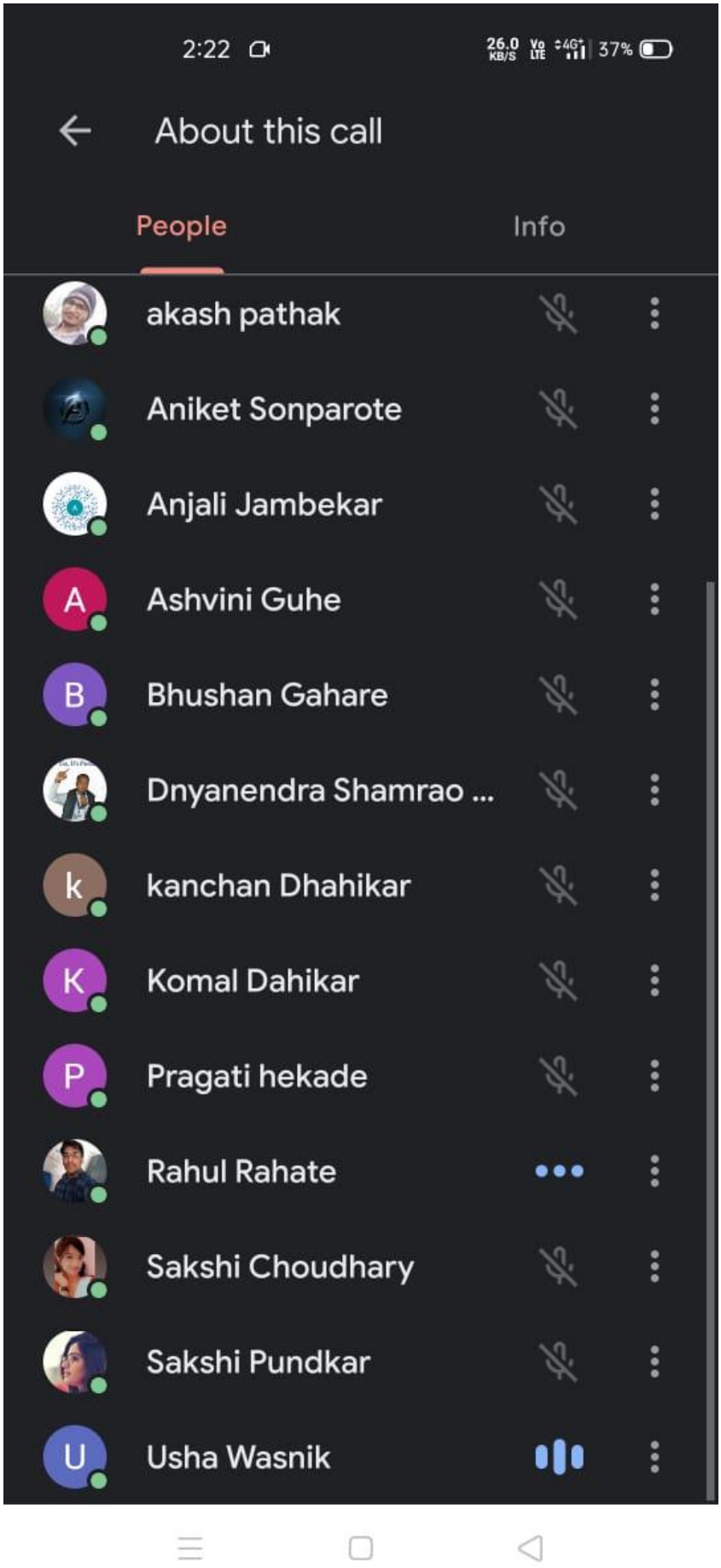
Live On Google Meet

Meeting Id :- https://meet.google.com/rbd-tvno-kzd

Speaker
Dr. Usha S. Wasnik
Assistant Professor
HOD, Dept. of Chemistry

Mr. R. P. Rahate
Assistant Professor
Dept. of Chemistry

Dr. D. S. Hedaoo
Assistant Professor
Dept. of Chemistry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Aniket Sonparote
Anjali Jambekar
Ashvini Guhe
Bhushan Gahare
Dnyanendra Shamrao ...
kanchan Dhahikar
Komal Dahikar
Pragati hekade
Rahul Rahate
Sakshi Choudhary
Sakshi Pundkar
Usha Wasnik

Arts, Science & Commerce College, Chikhaldara
Department of Chemistry

2019-20

Plastic Free Environment

Title of program conducted : ***Information about Plastic*** **pollution and awareness**
Date of program : **14th September 2019**
Objectives of program : **To inform about harm cause of plastic bags.**
To aware about plastic bags pollution.

Number of beneficiaries : **55 Students**

Brief summary of the program: In the academic year 2019-20 clippings on plastic bag pollution shown to Chemistry students of college, dated 14th Sep 2018 and aware them about harm effect of plastic bags on environment. Dr. U. S. Wasnik, Head Department of Chemistry gave important information about harm effects of plastic on human beings, animals and sea creatures. Students of B. Sc II Aniket Sonaprote and Pravav Munde showed the demonstration on making of paper bags by using old newpaper.

Ku. Samiksha Chorode anchored the program and Ku. Poonam Dukare ended it by vote of thanks.

Students also took oath regarding say no to plastic bags.

Dr. U. S. Wasnik, Assistant Professor, Head Department of Chemistry, addressed the students

Head
Deptt. of Chemistry
Arts,Science & Comm.College
Chikhaldara

Acting Principal
Art,Science & Commerce College
Chikhaldara, Dist. Amravati

Dr. U. S. Wasnik, Head, Department of Chemistry, addressed to the students

Arts, Science & Commerce College, Chikhaldara
Department of Chemistry
Extension Activity
2018-19

One Day Workshop
on
Recycled Newspaper Bags

Title of program conducted :	**Recycled Newspaper Bags**
Date of program :	**17th December 2018**
Objectives of program :	**To aware about plastic bag pollution.** **Reuse of waste newspaper.**
Number of beneficiaries :	**95 students**

Brief summary of the program: In the academic year 2018-19 one day workshop on recycled newspaper bags organised for the students of chemistry under the extension activity ***plastic free environment.***

The sole reason of undertaking this workshop is to make students understand the harm caused due to plastic bags and to encourage them to replace plastic bags with paper bags.

In this workshop Dr. Ku. S.N. Gupta, Associate Professor, Department of Chemistry Brijlal Biyani Science College, Amravati taught the students how to make paper bags and different articles out of newspaper. The students learn how to make paper bags from newspaper. Afterwards they signed with their name and their massage and thereby spread the massage of **say no to plastics.**

In this workshop students not just learn the art of making paper bag, they also learn the importance of recycling and how it can benefit for everyone.

Head
Deptt. of Chemistry
Arts,Science & Comm.College
Chikhaldara

Arts, Science & Commerce College, Chikhaldara

Acting Principal
Art,Science & Commerce College
Chikhaldara, Dist. Amravati

Dr. S. N. Gupta, Associate Professor, Brijlal Biyani Science College, Amravati addressed to the students

Students learn how to make newspaper bags

Students of Chemistry Department

Arts, Science & Commerce College, Chikhaldara
Department of Chemistry

2017-18

Plastic Free Environment

Extension Activity Report

Title of program conducted : ***Information about Plastic*** **pollution and awareness**

Date of program : **9th Sept. 2017**

Objectives of program : **To inform about harm effect of plastic polythene bags.**

To aware about plastic bags pollution.

Number of beneficiaries : **55 Students**

Brief summary of the program :

Department of chemistry organized Program on Plastic free Environment for students of B.Sc.I, dated 9th Sept. 2017, Saturday at time 10.30 to 11.30 am. in Seminar hall.

Dr. Ku U. S. Wasnik, Head and Assistant Professor , Dept. Of Chemistry share **ppt** on plastic bag pollution. Aware the students about how plastic polythene bags polluted the air when plastic bags burned they release toxic substances into air causing air pollution, also the harmful effect of plastic bags on human beings, animals and whole environment.

At the end of program all the students took oath that they not to use plastic bags and use only cotton bags & save earth.

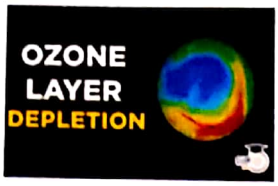
Head
Deptt. of Chemistry
Arts,Science & Comm.College
Chikhaldara

Acting Principal
Art,Science & Commerce College
Chikhaldara Dist. Amravati

Arts, Science & Commerce College

Dr. U.S. Wasnik addressed to the students

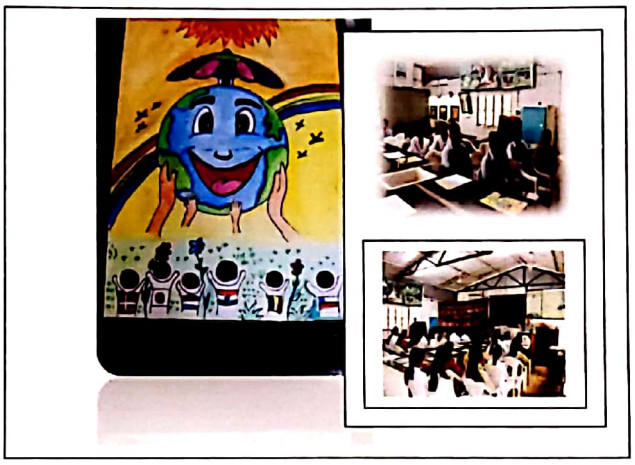
Students of Chemistry



Sipna Shikshan Prasarak Mandal Amravati
Arts, Science & Comm. College Chikhaldara,
Dist. Amravati 444807

Ozone Day Celebration

Students Speech, Poster Competition on Ozone Formation & Depletion



Submitted to:

Department of Environmental Science

Arts, Science & Comm. College Chikhaldara,

Dist. Amravati 444807

Academic Year 2018-19

Sipna Shikshan Prasarak Mandal Amravati
Arts , Science & Commerce College Chikhaldara
Dept. of Environmental Science

Ozone Day Celebration

Students Speech, Poster Competition on Ozone Depletion

Date of Program:16th Sept 2018

Objectives: To create awareness among students and society for Ozone layer protection and conservation.

To know about impacts of ozone depletion on Environment.

Number of participants : 25 students (B.Sc. I, II and III) Environmental Science

Brief report :

Ozone Day celebrationon16th Sept. 2018. The Department of Environmental Science organized the awareness program for the students of B. Sc. I , II and III. The department organized poster competition, speech by the students on Ozone depletion and its effectson Environmental parameters. B. Sc. II and III year students were participated in speech. For poster competition 25 students were participated, 3 students poster selected for 1st , 2nd and 3rd prize.

Time of Program – 11.00 am to 2.00
PM Students participation : 38
Lecturer in charge –Prof. G.D. Muratkar
(Head Dept. of Environmental Science)

Chief Guest : Prof. Anil F. Bobade,
In charge Principal,
Arts, Science & Commerce College, Chikhaldara.
Prof.V.S.Mangle– Environmental Science

G. D. Muratkar
Asst. Professor & H.O.D.
Dept. of Environmental Science
Arts,Science & Commerce College,
Chikhaldara

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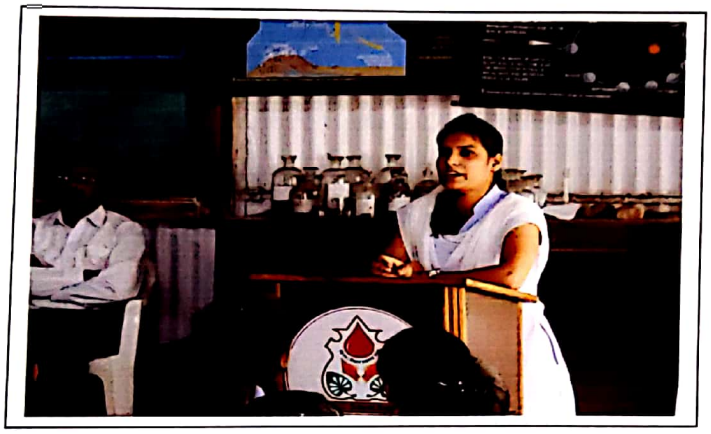
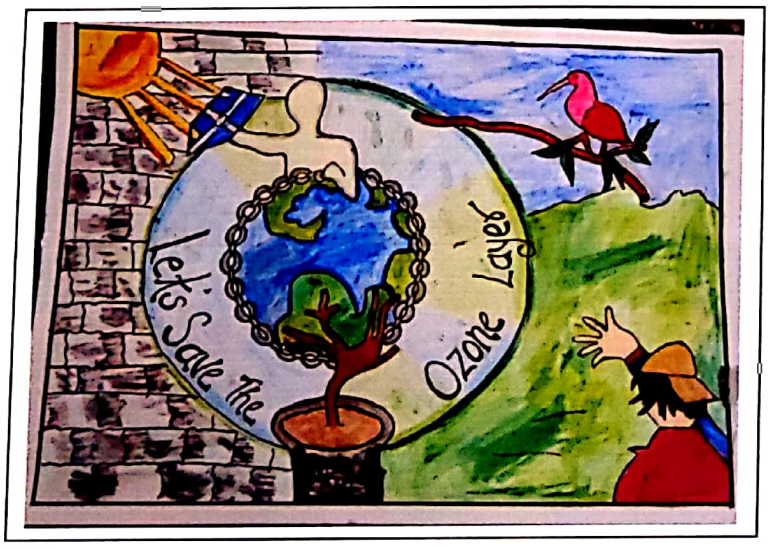
OzoneDayCelebrationImages:16thSept2018

Programe conduction by student of B. Sc. Part III



Introductory speech by B. Sc. Part II Students VrushaliTakarkhede

Posters bystudents



G. D. Muratkar
Asst. Professor & H.O.D.
Deptt. of Environmental Science
Arts,Science & Commerce College,
Chikhaldara

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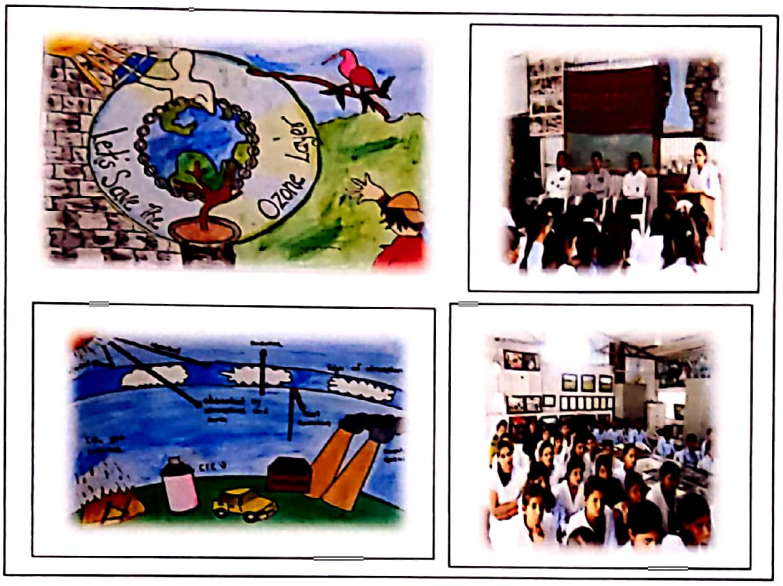
College, Chikhaldara

"Ozone Day Celebration"

Students Speech , Poster Competition on Ozone Formation & Depletion



Submitted to:

Dept. of Environmental Science

Arts, Science & Comm. College Chikhaldara,

Dist. Amravati 444807

Academic Year 2017 - 18

Dept.of Environmental Science

OzoneDay Celebration

Students Speech , Poster Competition onOzoneFormation & Depletion

DateofProgram :16th Sept 2017

Objectives : To create awareness among students and society forOzonelayer conservation.

Number of participants/ beneficiary:38 students(B. Sc. I , II andIII) EnvironmentalScience

Briefreport:(Context):

OzoneDaycelebrationon16th Sept.2017.TheDepartmentofEnvironmentalScienceorganizedtheawarenessprogramforthestudents of B. Sc. I , II and III. The department organized postercompetition, speech by the students on Ozone depletion and its effectson Environmental parameters. B. Sc. II and III year students wereparticipatedinspeech.Forpostercompetition38studentswerepartici pated,3studentsposterselected for1 ,2and 3prize.

Time of visit – 11.00 am to 12 .0

amStudentsparticipation: 38

Lecturer in charge – Prof. G. D. Muratkar (Head Dept. ofEnvironmentalScience)

ChiefGuest:Mr. M. Thigle , ACF Chikhaldara.

Prof.V.S.Mangle–Environmental Science

G. D. Muratkar
Asst. Professor & H.O.D.
Deptt. of Environmental Science
Arts,Science & Commerce College,
Chikhaldara

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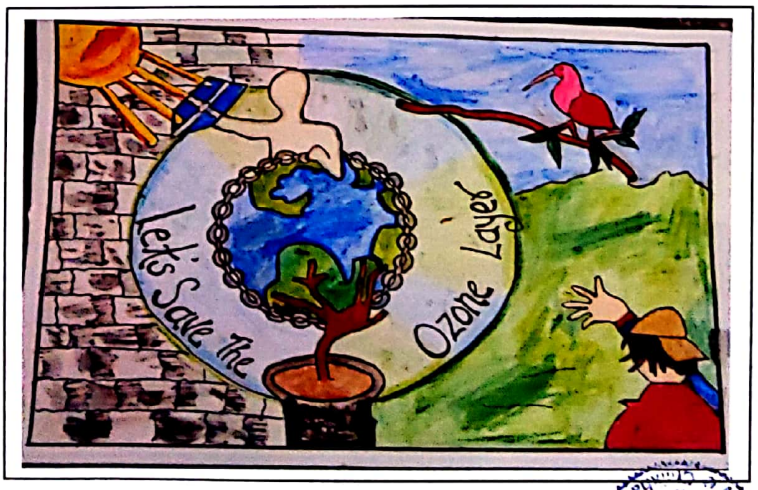
Images: 16th Sept 2017



G. D. Muratkar
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College, Chikhaldara

Extension Activity

Report on

"Census of Heritage Trees of Chikhaldara Area"

By:

Department of Environmental Science

Academic Year 2021-22

Extension Activity

Report on

Census of Heritage Trees of Chikhaldara Area

By:

Department of Environmental Science

Academic Year 2021-22

1. Title

Census of Heritage Trees of Chikhaldara Area

2. Goal / Objectives :

- To train college students for tree identification.
- To train college students for how to identify trees.
- To count the heritage trees of ChikhaldaraMuncipalCopuncil Area.
- To know the concept of Heritage trees.
- To know the criteria for heritage trees.
- Conservation of heritage trees by demarcation.

Participants in the field workshop

Sr. No.	Name of student participated in extension activity	Duration	Beneficiaries	Beneficiary Number
1	Ku. Renuka M. Bharate M. Sc. Part II Mr . C. M. Jambhekar	December 2021 toMay 2022	CEO , Muncipal Council Chikhaldfara , Dist. Amravati , Maharashtra State	02
2	Mr. SachinChawake Nodal Officer Heritage tree Census	December 2021 to May 2022	Nodal Officer Heritage tree Census	Complete population of Chikhaldara hill station

Concept

Chikhaldara Hill Station :Chikhaldara is 'Class C category' ULB having Population less than 40,000. • As of 2011 records, the total population of Chikhaldara has reached 5158. A decadal growth rate of about 9.49% was witnessed for a period between 2001 to 2011. Table below shows the population growth trend of Chikhaldara. • As per census records, the municipal area of Chikhaldara is approximately 3.94 Sq. Km i.e. 394 Hectare. Considering the census data of 2011, the Population Density is approximately 13 Person per hectare. •

Significant floating population is witnessed in the town as Chikhaldara is famous hill station. Although tourists come throughout the year with the peak in the month of July and August. As per data available with ULB floating population is 1,66,890 in year 2017 and is at peak in the month of July (30,473) and August (29,209). At per Census 2011, the town has 948 residential households / premises distributed into 18 wards • As per ULB records, about 569 Non-residential Premises are existing in the ULB jurisdiction. • The total road length in Town is 24.5 km. Out of the total road lengths, 73.88 % roads are width more than 3.5m, 24.9 % roads are width less than 3.5m. About 81.63 % roads are pucca roads and remaining 17.14 % are kutcha in nature. • The ULB currently produces total 0.74 MLD water. Out of the total water produced, 0.25 MLD water comes from Ground water sources (34%) and 0.49 MLD water comes from Surface water sources (66 %).

What are heritage trees?

Heritage Trees are **trees that have been formally recognized by City Council for their unique size, age, historical or horticultural significance.** Under the proposed amendment, a tree with an estimated age of 50 years or more shall be defined as a heritage tree. It may belong to specific species, which will be notified from time to time. Experts believe that in addition to the age, the state climate change department (which will be implementing the Tree Act), should also consider a tree's rarity, its botanical, historical, religious, mythological and cultural importance in defining a heritage tree. The local Tree Authority will have to ensure tree census to be carried out every five years along with counting of heritage trees.There are a range of criteria that designate a tree as a heritage tree. These attributes—both material and non-material—makes the tree stand out. The material attributes could be age or size of the tree. It could also be the result of the form or shape of the tree. Further, it could be that the tree is a rare species or a tree at risk of being lost. The non-material criteria relate to cultural and aesthetic aspects. It could be that the tree has a historical or cultural association either with a person, an event or a place. It could also be a tree associated with myth or folklore. A comprehensive definition of a heritage tree by Aird (2005) is given below:

"A notable specimen because of its size, form, shape, beauty, age, color, rarity, genetic constitution, or other distinctive features; a living relic that displays evidence of cultural modification by native or non-native people, including strips of bark or knot-free wood removed, test hole cut to determine soundness, furrows cut to collect pitch or sap, or blazes to mark a trail; a prominent community landmark; a specimen associated with a historic person, place, event or period; a representative of a crop grown by ancestors and their successors that is at risk of disappearing from cultivation; a tree associated with local folklore, myths, legends or traditions; a specimen identified by members of a community as deserving heritage recognition."

Under the proposed amendment, **a tree with an estimated age of 50 years or more** shall be defined as a heritage tree. The Maharashtra government will make amendments to the Maharashtra (Urban Areas) Protection and Preservation of Trees Act of 1975, to introduce provisions for the protection of 'heritage trees'.

Many of the heritage trees especially the Ficus are keystone species in the environment. **The old trees serve as important roosting, nesting sites or as a food source for many species of wildlife.**

The major criteria for heritage tree designation are **age, rarity, and size, as well as aesthetic, botanical, ecological, and historical value**. Heritage tree ordinances are developed to place limits upon the removal of these trees.

Heritage trees in India

In Benglauru city, the capital of Karnataka, is situated a 150 feet tall New Caledonian Pine or Cook Pine (also known in Asia as the Christmas tree) (Araucaria columnaris).

1. In Bengaluru is the DoddaAalada Mara or the Big Banyan (Ficusbenghalensis) estimated to be around 400 years old and whose canopy supported by aerial roots extends over 4 acres.
2. There are other famous banyans across the country such as the 550-year-old banyan in the BalSamand Palace in the desert city of Jodhpur, Rajasthan, that has a huge colony of bats roosting amongst its branches.
3. The banyan in Kolkata Botanical Garden, in Kolkata in West Bengal, with a canopy extending across 4.67 acres, and the 450-year-old banyan in Chennai, Tamil Nadu.
4. Another ancient banyan is found inside the Allahabad Fort and is protected by the Indian Army. The tree is visited by hundreds of pilgrims during the KumbhMela, which is held once in 12 years.
5. A tamarind tree in Gwalior, in the central Indian state of Madhya Pradesh, is planted on the tomb of Tansen, the famous singer and one of the jewels in the court of emperor Akbar.
6. Tamarind stands in the premises of the Osmania General Hospital in Hyderabad, Telangana, with a plaque that says, "This tree saved 150 lives".
7. While Dehra Dun may still be a small town, heritage trees are also present in crowded megacities such as Mumbai, the business capital of India and capital of the Maharashtra state. Scattered across the city are around 120 baobabs (Adansoniadigitata), African trees believed to have been brought to India a thousand years ago by Abyssinian and Portuguese traders. These are extremely rare 'green monuments' and are classified as to be protected according to a tree census conducted of trees in Mumbai.

The Context

Heritage Trees are trees that have been formally recognized by City Council for their unique size, age, historical or horticultural significance.

Under the proposed amendment, a tree with an estimated age of 50 years or more shall be defined as a heritage tree. The Maharashtra government will make amendments to the Maharashtra (Urban Areas) Protection and Preservation of Trees Act of 1975, to introduce provisions for the protection of 'heritage trees'.

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Results of Extension activity:

Heritage Trees Age wise

Sr. No.	Name of tree	50-60	60-80	80-100	100-150	150-200	More than 200
1	*Agathisrobusta*				150		
2	*Pinusroxburgi*				120		
3	*Arucariabidwai*					200	
4	*Ficusbengalensis*			100			
5	*Ficusreligiosa*		75				
6	*Cactus tree*			80-85	125		
7	*Toonaciliata*		75				
8	*Acrocarpusfraxinifolius*		80				
9	*Cupressussemipervense*				120		
10	*Eucalyptus obliqua*			100-120			
11	*Mangiferaindica*		75-80				
12	*Eugenia jambolana*		75				
13	*Lagerstomiaparviflora*	55					
14	*Caryeaarborea*	50					
15	*Grewiarobusta*		***75***				
16	*Coffeaarabica*				***150***		
17	*Artocarpusheterophyllus*		***75***				
18	*Mallotusphilipense*	***55***					
19	*Spathodiacampanulata*		***65-70***				
20	*Terminaliabelerica*	***50***	***80***				

Heritage Trees Numbers in Chikhaldara Hill Station :

Sr. No.	Name of tree	Number	% Distribution
1	*Agathisrobusta*	02	0.52
2	*Pinusroxburgi*	08	2.10
3	*Arucariabidwai*	05	1.30
4	*Ficusbengalensis*	09	2.36
5	*Ficusreligiosa*	10	2.4
6	*Cactus tree*	01	0.26
7	*Toonaciliata*	10	2.4
8	*Acrocarpusfraxinifolius*	70	18.56
9	*Cupressussemipervense*	10	2.4
10	*Eucalyptus obliqua*	10	2.4
11	*Mangiferaindica*	28	7.36
12	*Eugenia jambolana*	55	14.47
13	*Lagerstomiaparviflora*	01	0.26
14	*Caryeaarborea*	10	2.4
15	*Grewiarobusta*	21	5.52
16	*Coffeaarabica*	100	26.31
17	*Artocarpusheterophyllus*	05	1.30
18	*Mallotusphilipense*	10	2.4
19	*Spathodiacampanulata*	02	0.52
20	*Terminaliabelerica*	10	2.4
		380	

Heritage trees Native and Exotic trees %

Sr. No.	Native plants number	% of native heritage trees	Exotic heritage trees	% of exotic heritage trees	Remark
1	011	55 %			
2			09	45%	Exotic heritage trees % 50 , municipal carp oration promotes plantation of native trees

Outcome of the Extension Activity

Heritage Trees are **trees that have been formally recognized by City Council for their unique size, age, historical or horticultural significance**

Heritage trees are important, of course, for their biological value, but so also for their cultural value. Heritage trees are historical art facts—connecting urban residents to the past and providing a sense of belonging in cities.

Individual wise Heritage Tree Count of Municipal Council Chikhaldara

1	Agathisrobusta	Pine tree	Forest garden
2	Pinusroxburgi	Pine tree	Forest garden
3	Arucariabidwai	Khrismas tree	Forest garden
4	Ficusbengalensis	Wad	Devi point , near forest rest house , Circuit House , Tourism centre
5	Ficusreligiosa	Pimpal	Back of police station
6	Cactus tree	Cactus	Forest rest house
7	Toonaciliata	GorNeem	Police station , green valley
8	Acrocarpusfraxinifolius	Halige	College campus Sipna
9	Cupressussemipervense	Vidya	Electric rest house , Forest Rest house
10	Eucalyptus obliqua	Nilgiri	Back side of forest garden
11	Mangiferaindica	Mango	Circuit House
12	Eugenia jambolana	Jambhul	HVPM Campus
13	Lagerstomiaparviflora	Jarul	Tracery office opposite side
14	Caryeaarborea	Kumbhi	Rajakothi
15	Grewiarobusta	Silver oak	Upper Platue
16	Coffeaarabica	Coffee	Upper platue
17	Artocarpusheterophyllus	Jackfruit	Electricity rest house
18	Mallotusphilipense	Kumkum	Upper platue college campus Sipna
19	Spathodiacampanulata	Aakasshevaga , Shankasur	Near ITI Colege
20	Terminaliabelerica	behada	Hariken point
21	Old Phonix trees	Shindi trees	Opposite to police station
22	Jarul tree		Near treasury office
23	Amaltash trees	Cassia fistula	Wild distribution
24	Pechis tree	Peach	Rare distribution Gawalipura
25	Saitus bushes		Wild fruit trees
26	Old jambhul trees		
27	Litchi tree		Rare fruit tree of chikhaldara

Recommendations to Muncipal Council Chikhaldara authorities

- ❖ Muncipal Council Chikhaldara authorities can prepare the strategy plan for conservation of Heritage trees.
- ❖ Strategy plan : Long term & short term plan for trees conservation.
- ❖ Conservation of native trees.
- ❖ To promote native trees and to avoid exotic trees to maintan local diversity.
- ❖ Discussion in VrukshaPradhikaran Meeting regarding Heritage trees conservation.
- ❖ Conservation of old trees and to maintain their data.
- ❖ To promote afforestation programme of native trees

Heritage Conservative Measure:

The Maharashtra government will **make amendments** to the Maharashtra (Urban Areas) Protection and Preservation of Trees Act of 1975, to introduce provisions for the protection of 'heritage trees'. The Maharashtra Cabinet also green-lighted the formation of the Maharashtra Tree Authority in local civic bodies and councils which will take all decisions regarding the protection of trees.

Tree Authority formation

- The amendments also make room for the formation of the Maharashtra State Tree Authority and also tree authority in local civic bodies and councils.
- The Tree Authority is tasked with "increasing the tree cover in urban areas and protecting the existing ones." Experts shall be a part of the local tree authority.
- Their knowledge and expertise will form the basis of decisions taken up by the authority.
- Ensure preparation of a tree plan and should aspire over the years to have 33 percent green belt in their area.

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Head Department of Environmental Science

Arts, Science & Commerce College • Chikhaldara

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क्रमांक/चिनप/Heritage Tree Census/कावि- 100 /2022 दिनांक: -27/05/2022

Reference:- Letter:- चिनप/स्वच्छता/कावि/311/21-22 दि.31/12/2021

Letter of Completetion of Project on Census of Heritage Trees of Chikhaldara

With the reference to above reference it is to certify that, the Dept. of Enviromental Science Arts, Science & Commrece College, Chikhaldara completed the project works entitled "Census of Heritage Trees of Municipal Council Chikhaldara and submitted the project report on Dt.27.05.2022

Thanks for the co-operation & submission of Project. Especially thanks to Mr.Gajanan Muratkar Sir (HOD. Dept of EVS)

(Vijaya Rajendrasingh Somwanshi)
President,
Chikhaldara Municipal Council

(Sudhakar Panzade) 27/5/22
Chief Officer,
Chikhaldara Municipal Council

नगर परिषद, चिखलदरा स्वच्छ शहर जि. अमरावती

Extension Acvity Report

"Training to the Frontline staff of Forest Department for Grasslands Management in Protected Areas"












Training by

Prof. G. D. Muratkar

Assist. Prof. & Head Dept. of Environmental Science
Arts, Science & Commerce College, Chikhaldara
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Duraon of Acvity

2021 - 2022

Department of Environmental Science
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Extension Activity Report on Training to the Frontline Forest Staff for Grasslands Management in Protected Areas of India

1. Title

Training to the frontline forest staff for grasslands Management in Protected Areas of India (Kawal Tiger Reserve, Tadoba Andhari Tiger Reserve, Satpuda, Kanha Tiger Reserve MP, Keoladev National Park, Bharatpur, Rajasthan State, Pench Tiger reserve, MP, Melghat Tiger reserve, Maharashtra State).

2. Goal

- To train forest department frontline staff for grassland development and management in Protected Areas of India.
- To develop grazing habitat for herbivores in Protected Areas specially in Tiger Reserve, Sanctuary and National park.

Participants in the field workshop

Sr. No.	Name of Protected Area	Duration	Beneficiaries	Beneficiary Number
1	Kawal Tiger Reserve Telangana State	26 – 27 May 2022	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	45
2	Sanjay Gandhi National Park , Borivili (Mumbai)	November 2020	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	20
3	Tadoba Andhari Tiger Reserve MS	September 2021 to June 2022	DCF, Field Director, RFO, Section officer,	25
		(10 months)	Bit guard of tiger reserve	

4	Satpuda Tiger Reserve MP	22 – 24 October 2021 June 2022	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	40
5	Simlipal Tiger reserve , Orisa	19 -20 March 22	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	30
6	Pench Tiger Reserve MP	25 September 2021 1–2 November 2021	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	30
7	Melghat Tiger Reserve Maharashtra State	27/8/ 21 28/10/21 14/11/21	DCF, RFO, Section officer, Bit guard of tiger reserve	25
8	Telangana State Forest Academy Telangana State	22/02/ 22	DCF, RFO	45
9	Achanakmar Tiger Reserve, Chattisgarh State	December 21	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	30
10	Simlipal Achanakmar Tiger Reserve, Oresa	April 2021	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	30

Concept

Forest Ecosystem in Protected Areas shows distribution of grasslands, the % of forest should be 33% and grasslands 7 % ; but recently grasslands areas are decreasing year by year due to invasion of woody species and invasive weeds. Herbivores require grasslands for grazing, breeding, nesting, hiding habitats for wild habitat management.

Grasses are annual, perennial, soft, course, palatable and non palatable. Grasslands are of three types smaller, intermediate and taller. Soil present in forest ecosystem determines composition of grasslands. Fodder value of grasses determined by chemicals, nutrients, fiber % before and after flowering. Grasslands development and management in Protected Areas like Tiger reserve, Sanctuary is important work and to train frontline staff is regular work from 2012.

To know the soil characters, profile for grassland development in naturalpastures, degraded areas of forest and lantana removed areas for restoration ofgrasslands. To manage the grazing, browsing, breeding, nesting habitats.

To train the frontline staff for

- Grasses, weeds and wild leguminous plants identification from forest areas.
- Eradication of weeds from grasses for habitat improvement.
- Brushwood management.
- Geo mapping of grasslands.
- Grasses seeds collection, storage and enrichment.
- Restoration of grasslands.
- Enrichment of grasslands.
- Wild legumes seeds addition in grasslands.
- Soft and course feeder herbivores habitat management.
- Ecological restoration of degraded areas by grasslands development.

The Context

The Protected Areas includes Tiger Reserves, National Parks, WildlifeSanctuaries, the wildlife like Herbivores, Omnivores, Carnivores habited in theprotected areas. The grasses are the producers, soil binders, provides chemical energyto the wildlife in the form of fodder species. The protected areas forest are with 2-4.5% grasses naturally it should be 6 %- 7%. Now recently natural grasslands and relocated areas of the Protected Areas are developing in to good grasslands for the herbivores. Grasslands are the green ground cover of protected areas in forest. The grasses are useful for grazing habitat of wildlife (Herbivores). The threats to the grasslands are soil degradation, loss of soil moisture, leach out of nutrients of the soil, forests fires, weed infestation, woody species encroachment, and change in grasslands Composition, exotic species and decrease in nutritive value of the fodder grasses. The faculty member of the department of the college has the good expertise in the grasses, weeds and forests flora identification and their nutritive values.

The grassland management practices includes

1. To give the field training to the forests field staff in the natural grasslands and relocated areas of the Protected Areas in each season of the year.
2. To know the exact area of grassland year wise by demarcation of grassland area by GPS.
3. Grasses identification training to field staff by local names and scientific names.
4. Weeds identification with local names and their flowering season.
5. Browsing species identification with local names.
6. Field training to collect the grasses seeds and wild legumes seeds.
7. Weed eradication programme two times in a year
8. Grasslands enrichment by seed broadcasting in May - June season.
9. Grasses biomass management practices in mosaic pattern.
10. Wild fruit trees identification and addition in relocated areas.
11. Complete training programmes are organized by the CCF & Field Director of the respective Tiger Reserves in each season.

The practices in the field

1. Grasses identification – October.
2. Weeds identification – August.
3. Wild leguminous plants identification –September.
4. Weeds uprooting three times in each year.
5. Grasses seeds collection – September to February.
6. Wild legumes seeds collection - November – December.
7. Grasses seeds addition in selected areas for grassland development.
8. Observation of grasslands.
9. To know the composition of grasslands.
10. Brushwood management to reduce woodland.
11. To prepare grassland management register.

The detailed reports of field workshops for frontline staff are attached in the extension activity report with Text, Images with Geo-tag and appreciation letters.

Results of Extension activity

- Capacity building of frontline staff of Protected Areas.
- Field interventions for habitat improvement in Protected Areas.
- E Herbarium of grasses and identification.
- Documentation of bench marks and results.
- Comparative analysis before and after work.
- Ecological restorations of grasslands.
- Improvement in wildlife habitat.
- Frontline staff get trained for grasslands management.
- Forest Department in India actively participating in grasslands management.

Date : 30.04.22

Place : Chikhaldara

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Dist. Amravati.

Grassland Management Recommendations Report
Nauradehi Wildlife Sanctuary (M.P. State)

Date of Visit : July 2021 Observations

Nauradehi Wildlife Sanctuary, covering about 1,197 km^2 (462 sq mi), is the largest wildlife sanctuary of Madhya Pradesh state in India. This wildlife sanctuary is a part of 5500 km^2 of forested landscape. It is located in the centre of the state covering parts of Sagar, Damoh, Narsinghpur and Raisen Districts. It is about 90 km from Jabalpur and about 56 km from Sagar.

It is a potential site for the Cheetah Reintroduction in India. The cheetah prey density were reasonable and based on current prey density the area could support about 25 cheetahs. 750 km^2 area was recommended by relocation of 23 villages. After relocating the species, the site could support over 50 cheetahs and Nauradehi could harbour over 70 individuals.

The wildlife refuge is divided into six ranges,

- Mohli Range
- Singpur Range
- Jhapan Range
- Sarra Range
- D'Gaon Range
- Nauradehi Range

The flora consists of central Indian Monsoon forests, which include tropical dry deciduous forest. Major trees found are teak, saja, dhawda, sal, tendu (Coromandel ebony), bhirra (East Indian satinwood) and mahua. In March the deciduous trees begin to shed their leaves for a hot summer season.

The sanctuary exists as fragmented patches of variable density forest. The sanctuary needs more research and study of its habitats, flora, fauna and avi-fauna.

Grasses of Nauradehi Wl Sanctuary

The grasslands are annual as well as perennial with taller and intermediate type. The soil type with texture of clay, silt, loam with black and red colour. The grasses distribution : *Themeda quadrivalvis* (BHOND Grass), *Heteropogon contortus* (Sukra Grass) , *Dicanthium annulatum* (Kandi Grass) , *Chloris barbata*, *Chloris Virgata* (Gondali Grass) , *Aristida funiculata* (Khadda Grass), *Cynodon dactylon* (Duba grass), *Apluda mutica*, *Chrysopogon polyphyllus* (Fulera), *Paspaladium flavedium*, *Setaria pumilla*, *Setaria verticellata*, *Setaria intermedia*, *Eragostis tenella*, *Eragrostis pilosa*, *Eragrostis tenella*, *Ishaemum pilosum*, *Sehima nervosum*, *Themeda triandra.*

The grasses are annual as well perennial, palatable as well as non palatable.

Annual grasses

Themeda quadrivalvis , *Setaria intermedia*, *Setaria verticellata*, *Setaria pumilla*, *Dactyoleptium agypticum*, *Chloris barbata*, *Chloris virgata*, *Aristida funiculate* , *Eragrostris tenella* , *E. unioloides* etc.

Perennial Grasses

Dicanthium annulatum, *D. caricosum*, *Cynodon dactylon*, *Vitiveria zizanioides* , *Saccharum spontanium* , *Iselima laxum* , *Coix aquatic.*

Palatable Grasses

Dicanthium annulatum, D. caricosum, Cynodon dactylon, Vitiveria zizanioides, Saccharum spontanium, Iselima laxum, Themeda quadrivalvis , Setaria intermedia , Setaria verticellata , Setaria pumilla , Chloris barbata ,
Chloris virgate, Panicum , Elusine indica , Digitaria bicornis etc

Non Palatable grasses

Aristida funiculate , Aristida hystrax , Eragrostris tenella , E. unioloides etc.

Weeds present in grasslands

Cassia tora, Alternanthera sessalis, Alternanthera pungens, Parthenium hysterophorus , Xanthium strumium , All species of Sida – *S. cordata , S acuta.*

Wild Leguminous plants

Wild arhar (*Atylosia cajanoides*) , Wild mungo (*Phaseolus radiates*) , Indigofera all species.

Browsing Species

Bass (*Dendrocalamus strictus*), *Cassis fistula, Oojenia* spp., Bahunia all species , *Hardwicikia binnata* etc.

Wild fruit trees

Ber, Awala, Behada, Jamun , *Dyospyrus melanoxylon* (Tendu) , all ficus spp . Mahua.etc

Importance of grasslands

- Grasses are dynamics, energetics.
- Soil moisture conservation.
- Water conservation.
- Energy flow in ecosystem. Food chain, food web.
- Ecological pyramids
- Habitat management – grazing , browsing , nesting , hidden etc
- Ecosystem balance.

Grasslands Observations and Recommendations

Recommendations for each grass land of Relocated site A)

PIPLA

1. Weeds eradication in proper period. July , October and December.
2. The weed eradication should be before fruiting stages.

3. To prepare one observation grasses plot in Badas areas by selecting proper area.
4. Soil Moisture conservation work .... March- April.
5. Grasses seeds collection of palatable grasses..... Nov. - Dec.

B) VIJNI Rehabilitated grassland area

1. PARTHENIUM HYSTEROPHORUS (Congrass Grass) eradication in proper period.
2. To manage the natural grasses areas like Cynodon barberi and Dicanthium caricosum , Dicanthium annulatum by weed uprooting in suitable period.
3. Enrichment of perennial palatable grasses in July - August.
4. Grasses seed collection. next 4 days.
5. Addition of Bamboo rhizomes by proper planning.

C) RAMPURA

1. To maintain the natural grasses areas by uprooting of invasive weeds in proper period.
2. Parthenium and Sida cordata the dominant weeds shoula eradicate in next 3-5 years.
3. Management of Calotropies procera a woody species.
4. Bamboo rhizomes addition.... July - August.

D) KUSHYARI AREA

1. Weed eradication in proper way by scientific methodology.
2. Enumeration and propagation of browsing and fruit species from the total relocated area.
3. Grasses seeds collection for enrichment of good , palatable grasses as per soil suitability.
4. Parthenium management in proper period but in complete form.

E) NAURADEHI

1. Best grassland for spotted deer's because of plane areas and Cynodon, Dicanthium as dominant grasses on large %.
2. To develop natural water body in grassland in saucer shaped manner.
3. Weeds Management in proper period.
4. Bamboo shoots/ rhizomes addition... July -August.
5. Management of uprooted weeds.
6. To develop one grasses seed / experimental plot.
7. To conserve and manage wild natural grasses

Common recommendations for Nauradehi Wildlife Sanctuary Grasslands Management

- Conserve old grasslands by proper management interventions.
- Weeds eradication before fruiting.
- Uproot weeds along roadside as well as from inside grasslands.
- After weeds eradication – restoration by good grasses with suitable grasses.
- Brushwood management in suitable season.
- Relief enclosures in grassland in rotational manner.
- Concentrate on wild leguminous plants to maintain positive association and composition of grasslands.
- Site specific interventions' required. Identify grasses with local names.
- Ecological restoration by grasses seeds.
- Monitoring of grasslands season wise.
- Documentation of management interventions.
- Training for frontline field staff 2 times per year. Geo-mapping of each grassland.

Grasslands Management Protocol for Protected Areas

Sr. No.	Duration	Intervention	Remarks
1	March	Geo mapping of grasslands with display boards and well maintain mgt intervention Register and map of each grassland of selected sites for grassland management	To know exact area of grassland and invasive spp invasion. brush woods invasion

2	September	Grasslands types and composition observation by frontline staff for specific interventions	Taller. Smaller & Intermediate grasslands for Habitat Mgt.

3	September	Grasses identification with local names in each locality by frontline staff	To know grasses palatability
4	June – July	Weeds identification with local names in each locality by frontline staff	To know threats to grasslands in the form of invasion in grasslands of exotic species
5	August	Wild leguminous plants identification with local names in each locality by frontline staff	Biological N- Faxators which increases fodder value of grasses and soil Chemical Composition

6	July – First Phase August or September – Second Phase	Uprooting /Eradication of weeds from grasslands like Parthenium , Gajar Grass , Cassia tora etc.	To increase utility index of grasslands by uprooting and restoration(Weeds Uprooting before Fruiting of weeds)
7	July	Ecological Restoration after weeds uprooting	Restoration by: Grasses Seeds-grasses which are palatable and useful for Herbivores Steps of Restoration a) Site Selection b) Uprooting of weeds / Lantana camara c) Soil observation

			texture , Colour d) Grasses Seeds selection & broadcasting in June, july n weeds uprooted areas. e) Or grasses slips plantation select taller fodder grasses in July and add in Weeds uprooted or Lantana removed areas. Grasses Selection – Setaria , Dicanthium , Heteropogon , Chloris , Themeda

8	June -July	Lantana/ weeds uprooted areas (Site Selection): Ecological Restoration by Grasses Bundles or Pulas with grass seeds stage	• Selection of grasses • Monitor fruiting Stage • Cutting of grasses just near ti seeds areas. • Tight bundle • Transport • Add in selected sites in February • Observes results just after rains • After 15 days of rains grasses seeds germination • Serious monitoring by staff.

9		Ecological restoration in weeds / lantana removal areas	2 Years
10	September	Browsing species identification by staff	Useful for browsing herbivores like Gaur , Sambars etc
11	December	Wild fruit trees identification	Supplementary nutrition for Herbivores

12	Complete Year	Habitats Management Interventions as per Wildlife movement Distribution	Site Specific Interventions

13	August	Inspection Path in Grasslands	Intensive observations and management by staff frontline guards
14	September to February	Grasses Seeds Collection by Labours under supervision of Guards./ Deputy Rangers	• Grasses Seeds collection bags purchasing by RFO • Marker pens • Diary field • GARASSES SEEDS COLLECTION- Setaria , Dicanthium , Chloris , Digitaria , Themeda , Heteropogon , Chrysopogon etc
15		Grasses seeds drying	• Prepare wholes to seeds collection bags • Dry in direct sunlight for 10 days

			• Dry seeds in open condition by covering seeds for 4 days • Store with grasses names , GPS , Dates labels.
16	May 25 to June 15	Enrichment of grasslands in selected sites with protection and observations	Observe grasses seeds germination after 12 days under observation of guards and its images in Notecam
17	May-June	Fodder grasses standard grass plot/ Nursery to be prepared by Labours under supervision of RFO	**Steps** 1. Site selection 2. Grasses selection 3. Setaria , Dicanthium , Chloris, Digitaria, Themeda , Heteropogon , Chrysopogon etc 4. Demarcation pf plots with inspection path. 5. May 25th Grasses broadcasting in selected plots 6. Results observations.

18		No ploughing in grasslands by RFOs	Weeds % increases in grasslands due to change in soil texture

Grassland Management Recommendations Report

Satpuda Tiger Reserve

Date of Visit : 11,12 and 13 August 2021

Grasslands of Satpuda Tiger Reserve are with following observations

CHURNA RANGE (Churna, Jhalai, Ratibandar, Podar, Malni, Sakot, Khakrapura, Sakai)

Bori Range (Kakdi , Dhai, Bori , Bhadbhud and Janbh Grasslands)

Pachmarhi Subdivision (Rorighat, Kajari, Ghodanar & Badkachar)

Parsapani Buffer area Grassland Madhai Range Grasslands

All grasslands are of taller and intermediate type with dominance of Themeda (Ghuneri) or Bhond and Sukra (Heteropogon), Dicanthium,

Digitaria. Soil red, black with clay, loam and sand.

- Grasslands are of three types smaller, intermediate and taller.
- Grasslands with annual and perennial – palatable and non palatable grasses.
- Grasslands shows composition of wild leguminous plants like wild tuwar , wild mungo , wild barbati, wild udad etc.
- Grasslands are invaded by common weeds like *Amaranthus*, *Parthenium*, *Sida cordifolia* , *Ageratum conyzoides etc.*
- Wild fruit trees are present in each grasslands.
- Common palatable grasses observed are- Dicanthium annulatum (Kandi Grass), Dicanthium caricosum (Badi Kandi), Dicanthium strictum (Kandi), Bothrichloa bladhi (Kandi or Marvel), Bothrichloa tuberosa (Kandi), Bothrichloa pertusa (Kandi), Brachiaria mutica, B. ramose (Sama Grass). Ban Bajara or Newari – Setaria pumilla, Themeda (Bhond or Ghuneri), Heteropogon (Sukra), Saccharum (Kans grass), Cynodon (Duba), Eragrostris (Bhurbhusi), Iselima (Moshan or Mushel Grass) etc.
- Grasslands invaded by brush woods samples like Tectona, Chloroxylon Phoinix etc.

Grasslands with more utility % - index.

- Grasslands are taller.
- Grasslands are amphi-terrestrial as well as terrestrial.
- Wildlife specially Herbivores with grazing and browsing habitat.

Three days workshop on grasslands management was organized for frontline staff. The objectives of workshop are,

- Grasslands observation and to know its composition.
- Grasses identification with local names , palatable , non palatable , annual , perennial grasses.
- Weeds identification and uprooting techniques.
- Wild leguminous plants identification.
- Grasses , wild leguminous plants seed collection.
- Identification of grazing and browsing species.
- Lantana invasion.
- In situ conservation of leguminous plants present in grasslands.
- Enrichment of grasslands by grasses seed balls or by grasses slips.
- Restoration after removal of Lantana and weeds by suitable grasses.

Churna Range Grasslands : (Churna, Jhalai, Ratibandar, Podar, Malni, Sakot, Khakrapura, Sakai)

Recommendations : Identification of grasses, weeds, wild leguminous plants, browsing plants species with local names by forest guards, deputy rangers and shramik staff in each season.

1. Weeds uprooting two – three times per year before fruiting with soil conservation—July to September.
2. Grasses seeds collection per year in regular manner for enrichment of grasslands with suitable grasses which are palatable…. November to February.
3. Wild leguminous plants identification.. August when flowering or fruiting
   Field.
4. Grasses seeds collection in suitable time.
5. Seeds Collection --- Nov to Feb .
6. Restoration of grasslands after removal of Lantana or Weeds plants species in rainy season by grasses slips or rhizomes to develop grassy patches with fodder grasses….. July – Aug.
7. Wild leguminous plants in situ conservation for seeds collection and propagation.
8. Management of resting habitats by uprooting weeds below the fruit trees or green shrubs.

Special Remarks

- **Jhalai :** Weeds eradication and management , enrichment of grassland by grasses seeds or grass pulas. Wild fruit trees conservation. Inspection path preparation. After removal of Lantana restoration by good fodder grasses to reduce % of weeds and grasses % increase.
- **Ratibandar :** Weeds uprooting 3 times per year, Grasses seeds collection, wild legumes seeds collection.
- **Malini :** Concentrate on weeds , water bodies , Moist habitat grasses.
- **Kakdi :** Training to new staff for grasslands management.
- **Dhai :** Good water bodies are created , enrich with bothriochloa and saccharum, dicanthium and iselima grasses.
- **Bori :** Staff orientation two times per year. Weeds uprooting 3 times per year, brushwoods management , Saccharum enrichment in progress.
- **Rorighat :** Weeds uprooting 3 times per year. Soil with low water holding capacity and moisture don't burn grassland area in patches. Good increase in grassland area by removal of lantana its appreciable.
- **Kajari :** Newly rehabilitated area. Concentrate on weeds uprooting and lantana eradication and restoration by local fodder grasses.
- **Badkachar :** Good interventions by frontline staff in progressive manner, Weeds uprooting.
- **Parasapan Buffer Area :** Weeds uprooting before fruit formation. After removal of Lantana restoration is essential by local native grasses.

Grasslands Management Plan for Protected Area

- Geo-mapping of grasslands----March or April Soil observation – colour, texture --- March
- Grasslands observation…Aug to October
  Grasses identification at flowering stages with local names---Sept or October.
- Weeds identification …. July
- Wild leguminous plants identification …August
- Grasses herbarium preparation by frontline staff… Oct. or Nov
- Identification of grazing and browsing species
- Grasses restoration after removal of weeds or Lantana or any invasive spp.
- Grasses seeds collection …. Nov to Feb
- Grasses seeds drying and storage
- Grasslands enrichment by observing wildlife movements in grasslands

….. May last week or June first week

- Brushwood management to reduce woody species but unwanted with reference to site specific interventions as per suitability except hidden habitat to save.
- Relief enclosures in grasslands.
- Documentation of interventions in each season.

Grassland Management Recommendations Report Pench Tiger Reserve (M.P. State)

Date of Visit : 30 & 31 July 2021

Grasslands of Pench are with following observations

1. Grasslands are of three types smaller , intermediate and taller.
2. Grasslands with annual and perennial – palatable and non palatable grasses.
3. Grasslands shows composition of wild leguminous plants like wild tuwar, wild mungo , wild barbati etc
4. Grasslands are invaded by common weeds like *Cassia tora* , *Parthenium*, *Sida cordifolia* , *Ageratum conyzoides etc 5.* Wild fruit trees are present in each grasslands.
6. Common palatable grasses observed are- *Dicanthium annulatum* (Kandi Grass) , *Dicanthium caricosum* (Badi Kandi), *Dicanthium strictum*

(Kandi), *Bothrichloa bladhi* (Kandi or Marvel), *Bothrichloa tuberosa*

(Kandi), *Bothrichloa pertusa* (Kandi) , *Brachiaria mutica* , B. *ramose* (Sama Grass). Ban Bajara or Newari – *Setaria pumilla*, Themeda (Bhond or Ghuneri) , Heteropogon (Sukra), *Saccharum* (Kans grass), *Vitiveria* (Khus), Cynodon (Duba) , *Eragrostris* (Bhurbhusi), Iselima (Moshan or Mushel Grass) etc

7. Grasslands invaded by brush woods samples like Tectona , Chloroxylon , Phoinix etc.
8. Grasslands with more utility % - index
9. Grasslands are amphi-terrestrial as well as terrestrial.
10. Wildlife specially Herbivores with grazing and browsing habitat.

Pench Grassland with more palatable grasses

Two days workshop on grasslands management was organized for frontline staff. The objectives of workshop are,

- Grasslands observation and to know its composition.
- Grasses identification with local names, palatable, non palatable, annual, perennial grasses. Weeds identification and uprooting techniques.
- Wild leguminous plants identification.
- Grasses, wild leguminous plants seed collection.
- Identification of grazing and browsing species.
- Aquatic fodder plant species.
- In situ conservation of leguminous plants present in grasslands.
- Enrichment of grasslands by grasses seed balls or by grasses slips.
- Restoration after removal of Lantana and weeds by suitable grasses.

Pench Mogli Wildlife Sanctuary, Karmazari Range Grasslands

Recommendations

1. Identification of grasses, weeds, wild leguminous plants, browsing plants species with local names by forest guards , deputy rangers and shramik staff in each season .
2. Weeds uprooting two – three times per year before fruiting with soil conservation— July to September.
3. Grasses seeds collection per year in regular manner for enrichment of grasslands with suitable grasses which are palatable…. November to February.
4. Wild leguminous plants identification.. August when flowering or fruiting
5. Grasses seeds collection in suitable time.
6. Seeds Collection --- Nov to Feb.

7. Restoration of grasslands after removal of Lantana or Weeds plants species in rainy season by grasses slips or rhizomes to develop grassy patches with fodder grasses….. July- Aug.
8. Wild leguminous plants in situ conservation for seeds collection and propagation.
9. Management of resting habitats by uprooting weeds below the fruit trees or green shrubs.

Relief enclosures management

1. Relief enclosures for rest to soil and grasses flowering and fruiting.
2. After preparation of R. E. Pz select fodder grasses enrichment by seed balls or vegetative propagation in July.
3. Weeds eradication before seed formation.
4. Management season wise up to seed formation and open in December.

Grasslands Management Plan for Protected Area

- Geo-mapping of grasslands----March or April Soil observation – colour, texture ---March
- Grasslands observation…Aug to October
- Grasses identification at flowering stages with local names---Sept or October.
- Weeds identification …. July
- Wild leguminous plants identification …August
- Grasses herbarium preparation by frontline staff… Oct. or Nov
- Identification of grazing and browsing species
- Grasses restoration after removal of weeds or Lantana or any invasive spp.
- Grasses seeds collection ….Nov to Feb
- Grasses seeds drying and storage
- Grasslands enrichment by observing wildlife movements in grasslands…..May last week or June first week
- Brushwood management to reduce woody species but unwanted with reference to site specific interventions as per suitability except hidden habitat to save.
- Relief enclosures in grasslands.
- Documentation of interventions in each season.

Grassland Management Recommendations Report

Tadoba Andhari Tiger Reserve

Date of Visit : 1st to 3rd September 2021

Grasslands of Tadoba Andhari Tiger Reserve are of heterogeneous type with three types of grasslands : Smaller, intermediate and taller grasslands with 70% palatable and 30% non palatable grasses. The grasslands possesses 25% perennial palatable grasses and 45% annual fodder grasses with browsing species. The grasslands also comprises few wild leguminous plants. Most of the grasslands invaded by the weeds like Bhutganjya (Hyptis), Tarota (Cassia tora), Congress grass (Parthenium), Sida cordata, Sida acuta, Corchorus etc weeds. Each grassland is with water body. The management practices conducted by the field staff in last two months are,

Moharli, Palasgaon, Nawegaon, Pandharpauni, Jamni, Khatoda, Botezari, karwa range (TATR) all Grassland area :

Observations

- Weeds invasion along roadside area and inside the grasslands on large scale.
- Seeds of *Setaria pumilla* (Wild Bajara) developed in each grassland.
- Weeds like Bhutgangya (Hyptis saveolens) dominant in each grassland.
- Ageratum conyzoides weed common in grasslands.
- Palasghaon Grassland : 85 Hect.
- Palasgaon village rehabilitated in 2019, mostly all were paddy fields before rehabilitation , soil fertile, grasses taller, intermediate, Iselima laxum, Digitaria abludens, Setaria pumilla, Paspaladium, Themeda, Heteropogon grasses are distributed in complete grassland, weeds invasion in more % in gaothan and other area of Palasgaon. Wild Leguminous plant Wild Tur (Atylosia or Cajanus) is dominant. Bhutganjya, Sida weeds common in grassland.

Navegaon Grassland : 274 Hect area.

Observations

1. Largest grassland of TATR with 274 hect area.
2. Taller , intermediate grassland.
3. Grassland invaded by ranbhendi, weeds like Bhutganjya, Sida, Cassia tora etc.
4. Weeds invasion in boundaries of grasslands.
5. Grasses : Themeda, Heteropogon, Dicanthium, Iselima, Ischemum, Cynodon , Digitaria ,

Elusine, Chloris , Setaria etc.

6. Wild legumes : Ran Tur, Ran moog , Ran Barbati.
7. Wild fruit trees like Bor.
8. Brush woods invasion of Acacia.
9. Roadside grasses with more weeds.
10. Wild tur dominant in grassland.
11. Dominant grasses are Themeda, Iselima, Heteropogon.

Recommendation's

1. Weeds uprooting two times per year – July, September, before flowering, fruiting weeds to be uprooted.
2. Brush woods management to reduce woody species but conserve fruit trees.
3. Uprooting of Bhendi plants from grasslands.
4. Prepare inspection path of standard size in each grassland.
5. To prepare grasses, wild legumes seed plot with demarcation.
6. Management of resting habitat.
7. Uprooting of Beshram plants.
8. After uprooting of unwanted non fodder weeds – Ecological Restoration by gawat pendi with grasses seeds.

Restoration after removal of weeds by fodder grasses seeds

- In next 20 days grass seeds collection is necessary.
- Grasses selection for seed collection are Dicanthium annulatum, D. caricosum, D. tuberosum, Themeda quadrivalvis, Iselima, Setaria.
- Collection of wild leguminous seeds from 2nd December to 28th December.

Jamni Grassland : 47 Hect

Observations

1. Smaller grassland suitable for spotted deers, black bucks .
2. Grasses distribution : Cynodon, Dicanthium, Setaria pumilla, Dicanthium annulatum, Iselima prostratum, I. laxum, Chloris virgate, C. barbata, Elusine indica , Setaria italic, etc.
3. Weeds : Prthenium hysterophorus (Gajar Gawat) dominant weed, Sida , Hyptis , Cassia tora.

4. Ornamental plants sadafuli.
5. Wild fruit trees present.
6. Water body present.

Recommendation's

1. Weeds uprooting two times per year – July , September, before flowering , fruiting weeds to be uprooted.
2. Brush woods management to reduce woody species but conserve fruit trees.
3. Uprooting of ornamental plants from grasslands.
4. Prepare inspection path of standard size in each grassland. 5. To maintain pressure the grasses of Jamni grasses – relief.
6. enclosure of 2 hectares size to be prepared, number two in jamni.

Kosenkar Grassland : 10 Hect

Observations

1. Oldest grassland with smaller and taller grasses.
2. Most of the grasses are palatable,
3. Wild fruit trees present
4. Brushwood infestation on large %
5. Grasses utility index good more than 70%.

Recommendation's

1. Uproot weeds along roadside before fruiting. Weeds like Butganjya, Sida, Cassia tora.
2. Brushwood Management to reduce woody species.

Khatoda Grassland : 10 Hect.- Comp. No. 123

Recommondations

1. Weeds uprooting two times per year

2. Brushwood management

One of the best grassland of TATR, Conserve old grasslands from woody plant species and invasive weeds.

Kolasa Range Grasslands

Roadside Grassland towards Botezari road : 11 Hect.

Observations

1. Roadside taller grassland with dominant grasses like Themeda, Heteropogon , Dicanthium , Setaria.
2. Grassland invaded by exotics like Stylosanthes hammata.
3. Wild legumes in good %
4. Brushwood invasion in grassland.

Recommendation's

1. Weeds uprooting two times per year.
2. Uprooting of exotic species – Stylo
3. Brushwood management
4. Conserve wild leguminous plants.

Botezari Grassland : 37 Hect.

Observations

1. Larger grassland with smaller and taller grasses like Saccharum spontanium(Padyal Gawat)
2. Grasses : Durwa Gawat, Dicanthium, Iselima, Ran bajara, Ghonyad, Kusali
3. Weeds: Bhutganjya, Kena, Adhada, Tarota, Gajargawat in Gawathan area of 4.5 Hectares.
4. Ploughing in 2,5 hect area where Cynodon (Durva) grass was present.
5. Enclosure for spotted deers prepared in which high % of weeds and taller grasses are present.
6. 2, 5 hectares cynodon grass was present but due to ploughing weeds are infested in deers enclosure.

Recommendation's

1. For spotted deer's they require smaller, palatable nutritive grasses with 20% taller grasses and green bushes for resting habitat.
2. Wild fruit trees
3. Browsing bushes wild.
4. There should not be ploughing in Protected Areas.
5. Weeds uprooting and restoration by Cynodon , Dicanthium , Ranbajara , Kodo , Ravi gawat
6. For spotted deers develop suitable grassland in enclosure.
7. Uproot weeds from gaothan area

Common recommendations for TATR Grasslands Management

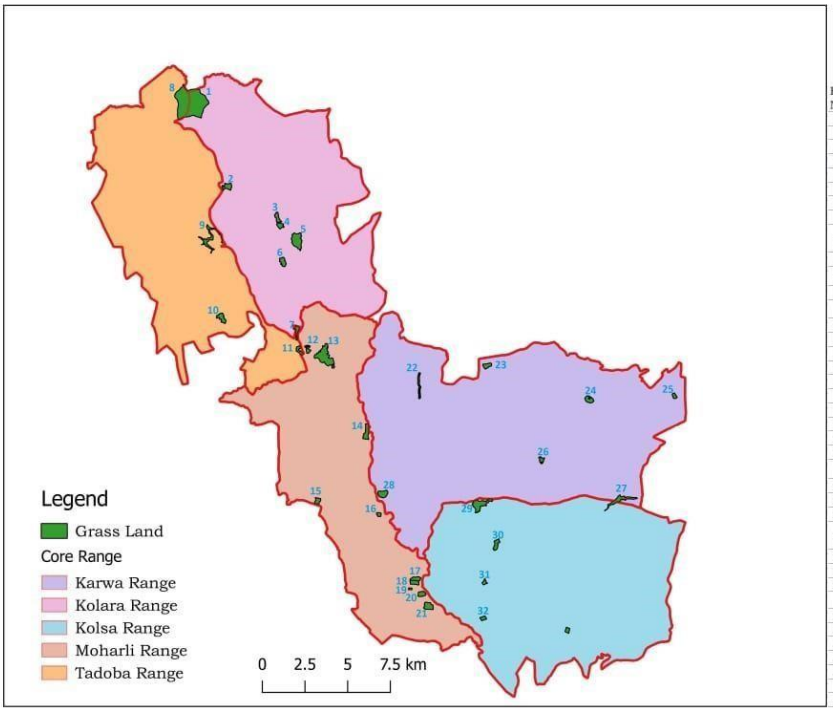
1. Conserve old grasslands by proper management interventions
2. Weeds eradication before fruiting
3. Uproot weeds along roadside as well as from inside grasslands
4. After weeds eradication – restoration by good grasses with suitable grasses.
5. Brushwood management in suitable season
6. Jamani relief enclosures in grassland in rotational manner
7. Concentrate on wild leguminous plants to maintain positive association and composition of grasslands
8. Site specific interventions' required
9. Identify grasses with local names
10. Ecological restoration by grasses seeds
11. Monitoring of grasslands season wise
12. Documentation of management interventions 13. Training for frontline field staff 2 times per year.
14. Palasgaon grassland with proper inputs.
15. Botezari don't plough , select suitable grassland for rescue of spotted deers.
16. Geo-mapping of each grassland

Grasslands Management Protocol in Protected Areas

Sr No.	Season for management Inputs	Intervention for grassland mgt	Remark
1	April -May	Geo mapping of grassland	To know exact area of grassland
2	May	Soil texture observation	Soil suitability for Grasses
3	September	Grasses identification with local names	
4	August	Weeds identification with local names	
5	July and September	Weeds uprooting	Weeds uprooting before fruiting
6	September to February	Grasses seeds collection	Grasslands Enrichment
7	25th May to 10 June	Enrichment of grasslands	
8	June – July	Brushwood management	

9	June	Lantana uprooting and restoratins by seeds or grass rhizomes	
10	Sept – Oct.	Taller grasses biomass management in mosaic pattern	
11	September	To know utility index of grasses	
12	September	Wild leguminous plants identification	N- Fixators
13	December	Wild legumes seeds collection	Increase good associates of grasses
14	Complete year	Documentation of inputs Date	

Map Showing Campa Work Year 2020- 21 in TATR Core area



Rf. No.	Grass Land Name	Area	Actual work done
1	Navegaon Grass Land	235 Ha.	235 Ha.
2	Pandharpaoni G. Land	30 Ha.	30 Ha.
3	Saradh Grass Land	10 Ha.	10 Ha.
4	Samadhi Grass Land	8 Ha.	8 Ha.
5	Jamni Grass Land	47 Ha.	47 Ha.
6	Rampur Grass Land	12 Ha.	12 Ha.
7	Kosekanar Grass Land	10 Ha.	10 Ha.
	Kolara Range- Total	**352 Ha.**	**352 Ha.**
8	Navegaon Grass Land Part- 2	40 Ha.	34 Ha.
9	Tadoba beat C.No. 90	33 Ha.	33 Ha.
10	Ghosari Beat C.No. 114	17 Ha.	17 Ha.
11	Khatoda Grass Land	10 Ha.	10 Ha.
	Tadoba Range- Total	**100 Ha.**	**94 Ha.**
12	Palsgaon C.No. 128	10 Ha.	10 Ha.
13	Palasgaon Grass Land	85 Ha.	85 Ha.
14	Ashtkoni C.No. 146	20 Ha.	20 Ha.
15	Andhari C.No. 150	10 Ha.	10 Ha.
16	Andhari C.No. 151	7 Ha.	7 Ha.
17	Girghat C.No. 157	13 Ha.	13 Ha.
18	Girghat C.No. 157	11 Ha.	11 Ha.
19	Girghat C.No.158	2 Ha.	2 Ha.
20	Girghat C.No.158	12 Ha.	12 Ha.
21	Girghat C.No.158	20 Ha.	20 Ha.
	Moharli Range- Total	**190 Ha.**	**190 Ha.**
22	Karwa-II C.No. 251	10 Ha.	
23	Anandgaon C.No. 254	10 Ha.	
24	Piparheti-II C.No. 260	15 Ha.	
25	Pandharwani C.No. 267	5 Ha.	32 Ha.
26	Rantalodhi-I C.No.284	7 Ha.	
27	Sukadi Bodi G. Land	10 Ha.	
28	Zinganat-I C.No. 299	20 Ha.	
	Karwa Range- Total	**146 Ha.**	**32 Ha.**
29	Botezari Grass Land	41 Ha.	
30	Kohapari C.No.311	11 Ha.	
31	Fulzari Lake G. Land	5 Ha.	32.50 Ha.
32	Panghat Hut Road	6 Ha.	
33	Belan Square C.No.342	6 Ha.	
	Kolsa Range- Total	**69 Ha.**	**32.50 Ha.**
	Grand - Total	**857 Ha.**	**700.5 Ha.**

Grassland Management Recommendations Report

Tadoba Andhari Tiger Reserve

Date of Visit : 7th and 8th May 2022

Grassland Management observations in Tadoba Andhari Tiger Reserve Grasslands of Tadoba Andhari Tiger Reserve are of heterogeneous type with three types of grasslands : Smaller , intermediate and taller grasslands with 70% palatable and 30% non palatable grasses. The grasslands possesses25% perennial palatable grasses and 45% annual fodder grasses with browsing species. The grasslands also comprises few wild leguminous plants. Most of the grasslands invaded by the weeds like Bhutganjya (Hyptis), Tarota (Cassia tora), Congress grass (Parthenium), Sidacordata , Sidaacuta , Corchorusetc weeds.Each grassland is with water body.The management practices conducted by the field staff in last two months are,

Moharli, Palasgaon, Nawegaon, Pandharpauni, Jamni, Khatoda, Botezari , karwa range (TATR) all Grassland area :

Observations

- Weeds invasion along roadside area and inside the grasslands on large scale.
- Seeds of Setariapumilla (Wild Bajara) developed in each grassland Weeds like Bhutgangya (Hyptissaveolens) dominant in each grassland. • Ageratum conyzoides weed common in grasslands

Palasghaon Grassland : 85 Hect.

Palasgaon village rehabilitated in 2019, mostly all were paddy fields before rehabilitation, soil fertile, grasses taller, intermediate, Iselimalaxum, Digitariaabludens, Setariapumilla, Paspaladium, Themeda, Heteropogon grasses are distributed in complete grassland, weeds invasion in more % in gaothan and other area of Palasgaon. Wild Leguminous plant Wild Tur (Atylosia or Cajanus) is dominant. Bhutganjya, Sida weeds common in grassland.

Recommendations

1. Brushwood management
2. weeds uprooting from gaothan area. 3. Enrichment in next two

years continuously.

Navegaon Grassland : 274 Hect area

1. Largest grassland of TATR with 274 hect area.
2. Taller , intermediate grassland
3. Grassland invaded by ranbhendi , weeds like Bhutganjya, Sida , Cassia tora etc.
4. Weeds invasion in boundaries of grasslands
5. Grasses : Themeda, Heteropogon, Dicanthium, Iselima, Ischemum, Cynodon, Digitaria, Elusine, Chloris, Setaria
6. Wild legumes : Ran Tur , Ran moog, Ran Barbati
7. Wild fruit trees like Bor
8. Brush woods invasion of Acacia
9. Roadside grasses with more weeds
10. Wild tur dominant in grassland
11. Dominant grasses are Themeda, Iselima, Heteropogon

Recommendation's

- Weeds uprooting two times per year – July , September, before flowering , fruiting weeds to be uprooted.
- Brush woods management to reduce woody species but conserve fruit trees.
- Prepare inspection path of standard size in each grassland To prepare grasses, wild legumes seed plot with demarcation.
- Management of resting habitat

- After uprooting of unwanted non fodder weeds – Ecological Restoration by gawatpendi with grasses seeds.

Restoration after removal of weeds by fodder grasses seeds

- In next 20 days grass seeds collection is necessary.
- Grasses selection for seed collection are Dicanthium annulatum, D. caricosum, D. tuberosum, Themedaquadrivalvis, Iselima, Setaria.
- Collection of wild leguminous seeds from 2nd December to 28th December.

Jamni Grassland : 47Hect Observations

1. Smaller grassland suitable for spotted deers, black bucks
2. Grasses distribution : Cynodon, Dicanthium, Setariapumilla, Dicanthiumannulatum, Iselimaprostratum . I. laxum, Chloris virgate, C. barbata, Elusineindica, Setaria italic , etc
3. Weeds : Parthenium hysterophorus (Gajar Gawat) dominant weed, Sida, Hyptis, Cassia tora 4. Ornamental plants sadafuli
5. Wild fruit trees present.
6. Water body present.

Recommendation's

- Weeds uprooting two times per year – July , September, before flowering , fruiting weeds to be uprooted
- Brush woods management to reduce woody species but conserve fruit trees
- Uprooting of ornamental plants from grasslands.
- Prepare inspection path of standard size in each grassland
- To maintain pressure the grasses of Jamni grasses – relief enclosure of 2 hectares size to be prepared, number two in jamni.

Kosenkar Grassland : 10Hect Observations

1. Oldest grassland with smaller and taller grasses.
2. Most of the grasses are palatable.
3. Wild fruit trees present

4. Brushwood infestation on large %
5. Grasses utility index good more than 70%.

Recommendation's

1. Uproot weeds along roadside before fruiting. Weeds like Butganjya, Sida, Cassiatora.
2. Brushwood Management to reduce woody species.

Khatoda Grassland : 10 Hect.- ssland towards Botezariroad : 11 Hect.

Observations

1. Roadside taller grassland with dominant grasses like Themeda,
2. Heteropogon, Dicanthium , Setaria
3. Grassland invaded by exotics like Stylosantheshammata.
4. Wild legumes in good %
5. Brushwood invasion in grassland.

Recommendation's

1. Weeds uprooting two times per year.
2. Uprooting of exotic species – Stylo
3. Brushwood management
4. Conserve wild leguminous plants.

Buffer Area grassland Restoration : 10 Hect. Enclosure plot

Observations

1. Grassland with smaller and taller grasses , Weeds , Brushwoods
2. Grasses : Dicanthium , Ran bajara, Ghonyad , Kusali

Recommendation's

1. For spotted deer's they require smaller, palatable nutritive grasses with 20% taller grasses and green bushes for resting habitat.
2. Wild fruit trees

3. Browsing bushes wild.
4. There should not be ploughing in Protected Areas.
5. Weeds uprooting and restoration by Chrysopogon , Dicanthium , Ranbajara , Ravi gawat

Recommendations for grasslands management in weeds infested areas

- Soil parameters observations of each grassland with reference to texture, ph and color.
- Weeds identification : annual or perennial weeds Selection of grasslands restoration methods.
- Selection of proper grasses species for restoration of weeds.
- Addition of grasses seeds ……May 25th to 10th June
- Addition of grasses bundles with mature grasses seeds…….December – January
- Grasses species selection – Heteropogon , Chrysopogon , Bothriochloa , Setaria , Dicanhium and wild legume seeds.
- Observations and monitoring of grasses seeds germination.
- Maintance of grasslands management register.

Common recommendations for TATR Grasslands Management

1. Conserve old grasslands by proper management interventions
2. Weeds eradication before fruiting
3. Uproot weeds along roadside as well as from inside grasslands
4. After weeds eradication – restoration by good grasses with suitable grasses.
5. Brushwood management in suitable season
6. Jamani relief enclosures in grassland in rotational manner
7. Concentrate on wild leguminous plants to maintain positive association and composition of grasslands
8. Site specific interventions‘ required
9. Identify grasses with local names
10. Ecological restoration by grasses seeds
11. Monitoring of grasslands season wise
12. Documentation of management interventions 13. Training for frontline field staff 2 times per year.
14. Palasgaon grassland with proper inputs.

15. Geo-mapping of each grassland.

Grassland Management Recommendations Report

Bharatpur Bird Sanctuary (Rajasthan)

Date of visit : 31st March to 1st April 2022

Grassland Management observations in Keoladeo National Park

Keoladeo National Park, Rajasthan which is named after a Shiva temple located at the center of the Park. It was earlier known as ―Ghana‖, meaning dense forest. This national park is also popularly known as ‗Bharatpur Bird Sanctuary‘. The forest block is named as ‗Ghana Kevladev‘ in land records. Keoladeo National Park lies at the confluence of the Gambhiri and Banganga rivers in Bharatpur district of Rajasthan. Its approximate latitudinal and longitudinal extent are - 27 07 06 N - 27 12 02 N and 77 29 05 E - 77 33 09 E respectively.

This Protected Area traditionally has been divided into 24 administrative blocks (demarcated by roads and dykes) for administrative convenience. The composite unit is demarcated by a boundary wall on all sides. The entire park of 28.73 km2 was divided into various blocks.

Wetland Zone -835 hectare

Grassland zone – 923 hectare

Woodland zone – 1062 hectare

Sr. No.	Zones	Area (Hectares)	Type
1	Zone 1 A-1	45.85	Woodland
2	A-2	12.82	Wetland
3	B-1	89.68	Woodland
4	B-2	35.64	Wetland

5	C	38.57	Woodland
6	D	124.56	Wetland

7	E-1	128.56	Wetland
8	E-2	31.41	Woodland
9	F-1/01	43.98	Wetland
10	F-1/02	95.59	Woodland
11	F-2/01 , F-2/02 F3 F4	59.97 31.26 51.61 29.31	Wetland Woodland Grassland Grassland
12	G1 G2 G3 G4	175.39 Grassland 124.65 Grassland 86.07 Grassland 134.84 Grassland	Grassland
13	H	58.84 Grassland	
14	I	161.85 Woodland	Woodland
15	J-1 , J-2 K- K-24, 02	147.82 Woodland , 61.26 Woodland , 01 120.63 Wetland , 61.42 Woodland	Woodland
16	K-03	22.29 Grassland	
17	L-1/01	31.75 Woodland	
18	L-1/02	238.61 Wetland	

19	L-1/03	24.08 Woodland	
20	L-2/01	96.34 Woodland	
21	L-2/02	36.41 Grassland	
22	L-2/03	24.41 Woodland	
23	M-1 , M-2	141.2 Grassland , 63.34 Grassland	
24	N-1	30.77 Woodland	
25	N-2	42.51 Wetland	
26	O-1	100.97 Woodland	
27	O-2	27.85 Wetland	Total Area - 2832.11

Grasslands of are Keoladeo National Park of heterogeneous type with three types of grasslands : Smaller grasslands with wetlands, intermediate grasslands with fodder grasses, weeds and Prosopis, Parthenium, Cassia tora weeds and Woodland grasslands with 70% palatable and 30% non palatable grasses and prosopis invasive wood shrub species. The grasslands possesses55% perennial palatable grasses and 45% annual fodder grasses with browsing species. The grasslands also comprises few wild leguminous plants. Most of the grasslands invaded by the weeds Tarota (Cassia tora), Congress grass (Parthenium), Sidacordata , Sidaacuta . Each grassland is with water body.The management practices conducted by the field staff regularly are 1) weeds eradication 2) Prosopis removal, 3) Habitat improvement intervention – burning of grasses.

Grassland Zones blocks Current Vegetation Habitat and Wildlife

F-3 : Shrub Savanna with some tree groves like KadamKunj Heavily infested with Prosopisjuliflora

F-4 : Shrub Savanna with some tree groves like KadamKunj.

G-1 : Grass Savanna with mainly Vetiveria and Daab grass , Daab grass is dominating.

G-2 : Grass Savanna with mainly Vetiveria and Daab grass Daab grass is dominating. There are clearsigns of ecological succession. Herbivores like spotted deer

G-3 : Shrub Savanna (grasses Start to give to shrubs as we walk towards wetland area) Daab grass is dominating.. There are clearsigns of ecological succession.

G-4 : Shrub Savanna Daab grass is dominating. Khus grass has been reduced substantially. There are clearsigns of ecological succession.

H Semi : woodland kind of ecosystem. Heavy infestation of

Prosopisjuliflora

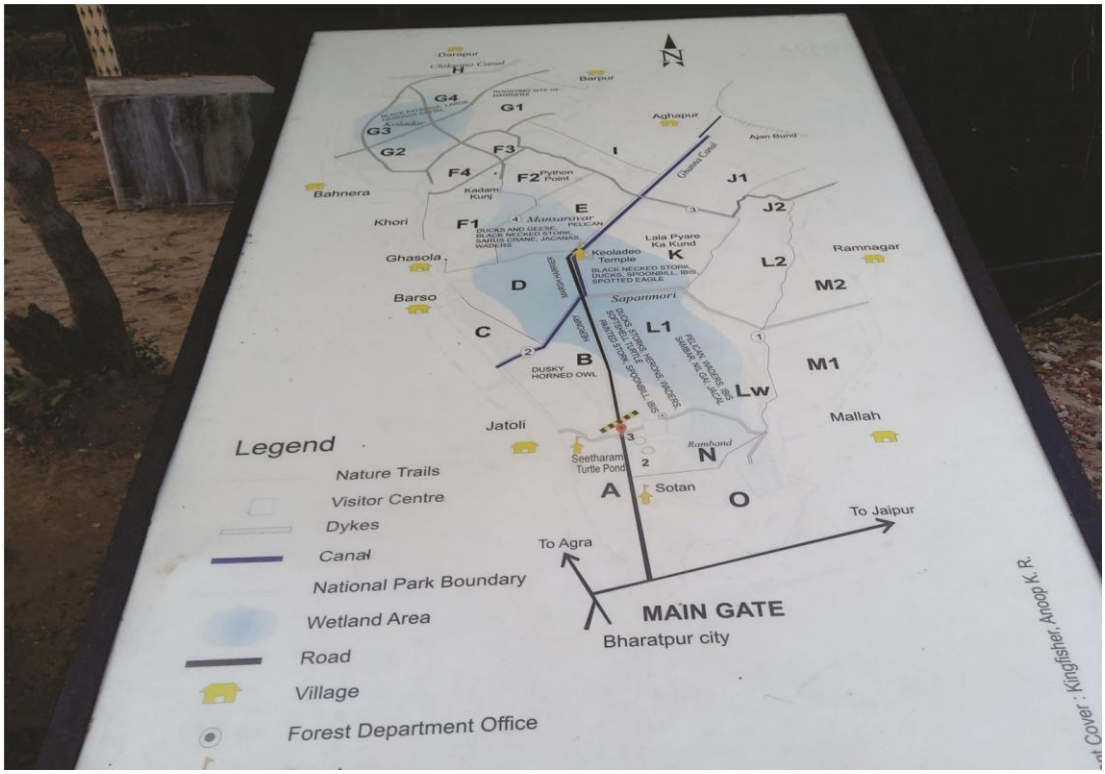
K–3 : Low Grasslands with Scattered Trees and Shrubs Recent removal of Prosopisjuliflora in this block has resulted in return of grasses.

L-2/03 : Low Grasslands with Scattered Trees and Shrubs Heavy infestation of Prosopisjuliflora

M1 : Shrub Savanna and also contains old plantation blocks Heavy infestation of Prosopisjuliflora.

M2 : Shrub Savanna and also contains old plantation blocks Heavy infestation of Prosopisjuliflora Need mechanical removal.

MAP of KNP



In the field workshop following sites are observed for grasslands management and recommendations.

Sr. No.	Block /zone	Observations	Recommendations	Remarks

1	G2	• 124 Hect. (10 hect.) • Weeds infestation • Brushwoods invasion • Homogenious grasses composition.	➢ Weeds uprooting 2 times per year- July &October. ➢ Taller , perennial palatable grasses needs biomass management in mosaic pattern. ➢ Resting habitat intervention required. ➢ Enrichment of native fodder grasses in MayJune. ➢ Avoid cool burning. ➢ Mapping of grassland every 2 years , polygon. ➢ Fire line preparation ➢ Grasslands management register with all interventions every season of year.	▪ Avoid ploughing in grasslands. ▪ Avoid burning of grasses. ▪ Brushwoods, invasive species management and rastorations by fodder native grasses.
2	G1	1) 50 Hectares 2) Weeds infestation 3) Brush woods invasion 4) Taller , perennial grass composition 5) Homogeneous grasses	➢ Weeds uprooting 2 times per year- July &October. ➢ Taller , perennial palatable grasses needs biomass management in mosaic pattern in October.. ➢ Resting habitat intervention required. ➢ Enrichment of native rhizomatous	▪ Needs grasses seeds collection , collect baseline data of 10 years back / old. ▪ Enrichment of grassland is most important

			fodder grasses in May-June.. ➢ Mapping of grassland every 2 years , polygon. ➢ Grasslands management register with all interventions every season of year	
3	L2 block	✓ Soil black , fertile , good soil for grasslands restoration. ✓ Weeds invasion ✓ Uprooting of Prosopis completed last year. ✓ Local fodder grasses regeneration observed.	1) Weeds uprooting 2 times per year. 2) Newly coming Prosopis removal. 3) 01 hectare grasses plot development selection of local grasses. 4) Control the growh of Dabb grass by CCT 5) Enrichment of grassland by grasses seeds broadcasting in May - June	Select local grasses- Dicanthium ,Chloris , Panicum , Paspalum , Cynodon all grasses are palatable & Native.

4	C	1) 44 Hectare area 2) Weeds infestation 3) Brush woods invasion in grassland block 4) Prosopis uprooted	✓ Prosopis removal &restoration by palatable local grasses selection. ✓ Enrichment of grassland by grasses seeds broadcasting in May – June ✓ Weeds uprooting 2 times per year. ✓ Grasslands management register with all interventions	Grasslands management register with all interventions every season of year Select local grasses- Dicanthium ,Chloris , Panicum , Paspalum , Cynodon all grasses are palatable & Native.

			every season of year	
5	Lw block	1) 24 hectare 2) Weeds infestation 3) Brush woods	✓ Prosopis removal &restoration by palatable local grasses selection.	

		invasion in grassland block 4) Prosopis uprooted	✓Enrichment of grassland by grasses seeds broadcasting in May – June ✓Weeds uprooting 2 times per year. ✓Grasslands management register with all interventions every season of year	
6	K Block	1) 204 hectare area 2) Weeds infestation 3) Brush woods invasion in grassland block 4) Prosopis uprooted	✓Prosopis removal &restoration by palatable local grasses selection. ✓Enrichment of grassland by grasses seeds broadcasting in May – June ✓Weeds uprooting 2 times per year. ✓Grasslands management register with all interventions every season of year	✓ Enrichment of grassland by grasses seeds broadcasting in May – June

Common recommendations for Grasslands Management

1. Conserve old grasslands by proper management interventions.
2. Weeds eradication before fruiting.
3. Uproot weeds along roadside as well as from inside grasslands.
4. After weeds eradication – restoration by good grasses with suitable grasses.
5. Brushwood management in suitable season
6. Concentrate on wild leguminous plants to maintain positive association and composition of grasslands.

7. Site specific interventions‘ required.
8. Identify grasses with local names.
9. Ecological restoration by grasses seeds.
10. Monitoring of grasslands season wise.
11. Documentation of management interventions .
12. Training for frontline field staff 2 times per year.
13. Geo-mapping of each grassland.

Grassland Management Recommendations Report

Kailadevi Wildlife Sanctuary (Rajasthan State)

Date of Visit : 30 March 2022

Grassland Management observations in Kailadevi Wildlife Sanctuary

Grasslands of Kailadevi Wildlife Sanctuary are of heterogeneous type with two types of grasslands : Smaller , intermediate grasslands with 70% nonpalatable and 30% palatable grasses. The grasslands possesses15% perennial palatable grasses and 45% annual fodder grasses with browsing species Dhok (Anagoeisis pendula) and Acacia species. The grasslands comprisesvery few wild leguminous plants. Most of the grasslands invaded by the weeds utganjya (Hyptis), Tarota (Cassia tora), Congress grass (Parthenium), weeds. Each grassland invaded with Prosopisjuliflora an invasive species.

Landscape and Topography

Soil with red sandy clay and loam, soil with low water holding capacity , undulating part with clay al lower side and rocky strata at upper surface. Rainfall very low in rainy season , humidity percentage low , wind speed moderate to high **. Observed grasslands sites**

1. Marmada Rehabiliated village
2. Retir kurtikarasta
3. Kalakhetamphiterrestrial grassland
4. Natural grassy patches along roadside
5. Maysura fall road- smaller grassy patch of 2-5 hectare
6. Chidki Naroli plantation C And D with area of 100 hectare

Marmada Rehabiliated village

Observations

- Rehabiliated village under process , after rehabilitation the cultivated lands are the good source of grassland development, natural stony or pathhar walls protection are present or each cultivated plot is protected by protection wall prepared from stones.
- Parthenium a weed common in grasslands Area to develop in grasslands Grassland : 50Hect.
- Water body present.
- Soil red , sandy with 45 % clay.

- Marmada village cultivated lands Grassland :2 74 Hect area
- Largest grassland of anthropogenic grassland (Marmada) of Kailadevi Wildlife Sanctuary.
- Taller , intermediate grassland
- Grasses : Themeda, Heteropogon, Dicanthium, Iselima, Ischemum, Cynodon, Digitaria,Elusine, Chloris, Setariaetc
- Wild fruit trees like Ber
- Browsing species of Acacia
- Roadside grasses
- Wild tur dominant in grassland
- Dominant grasses are Themeda, Ischemum, Dicanthium, cynodon, Apluda, Heteropogon

Recommendation's

- Weeds uprooting two times per year – September and October before flowering , fruiting weeds to be uprooted
- Brush woods management to reduce woody species but conserve fruit trees
- Prepare inspection path of standard size in each grassland
- Management of resting habitat
- After uprooting of unwanted non fodder weeds – Ecological Restoration by grasses seedsDicanthium , Heteropogon , Cynodon , Digitaria , Apluda.
- 5-7 kg grasses seeds per hectare in first year , 4-5 kg grasses seeds in second year and 2-3 kg grasses seeds in third year.
- Grasses seeds enrichment period may last week to june second week.
- Grasses selection for seed collection areDicanthiumannulatum, D. caricosum, D. tuberosum, Themedaquadrivalvis, Iselima, Setaria.

Area of grassland- 10-25 hectare with good potential of grassland and browsing species.

Observations

- Smaller grassland suitable for spotted deers, black bucks and chinkara
- Grasses distribution: Cynodon, Dicanthium, Setariapumilla, Dicanthiumannulatum, , C. barbata, Elusineindica, Setariaitalica , etc Weeds :

Prtheniumhysterophorusdominant weed, Cassia tora Wild fruit trees present. Soil red sandy

Recommendation's

- Weeds uprooting two times per year – July , September, before flowering, fruiting weeds to be uprooted
- Brush woods management to reduce woody species but conserve fruit trees
- Soil erosion control by soil practices
- To maintain domesticities grazing pressure the – relief enclosure of 2 hectares size to be prepared, number two - four.
- Enrichment of grasses every year in month of may – june.
- Observations and monitoring of grasslands.

Chidki Naroli plantation C And D with area of 100 hectare

Observations

1. Grassland in plantation with smaller and taller grasses.
2. Most of the grasses are palatable,
3. Wild fruit trees present
4. Brushwood infestation on large %
5. Grasses utility index good more than 70%.
6. About 10 palatable grasses distribution- Dicanthium ,Themeda , Iselima , Ischemum , Sporobolus , vitiveria , Heteropogon, Chloris , cynodon.
7. 2-3 water bodies (Talai) are present

Recommendation's

Uproot weeds before fruiting. Weeds like Echinopsechinatus spiny weed more in %, Cassia tora. , Brushwood Management to reduce woody species.

1. Weeds uprooting two times per year
2. Brushwood management
3. Enrichment of local /native fodder grasses – 4-8 kg per hectare , season of enrichment may - june.
4. Uprooting of exotic species – Prosopisjuliflora
5. Brushwood management
6. Addition of khus grass and Cynodon grass in July and August

Common recommendations for Kailadevi Wildlife Sanctuary Grasslands Management

- Conserve old grasslands by proper management interventions
- Weeds eradication before fruiting
- Uproot weeds along roadside as well as from inside grasslands
- After weeds eradication – restoration by good grasses with suitable grasses.
- Brushwood management in suitable season
- Site specific interventions‘ required
- Identify grasses with local names
- Ecological restoration by grasses seeds
- Monitoring of grasslands season wise
- Documentation of management interventions
- Training for frontline field staff 2 times per year. ▪ Geo-mapping of each grassland

Grassland Management Recommendations Report
Achanakmar Tiger Reserve (Chatishgarh State)

Date of Visit : December 2021

Grasslands of ATR : Achanakmar, Jalda, Bahod, Bokrakachar, Samabardasan , Kuba Area : 50 hectares each

Observations

- Weeding in July -August completed.
- Weeds - uprooted weeds are managed in proper way.
- Grasses biomass mgt in proper way.
- Grass sample plots are maintained technically.
- Positive grasslands ecological succession in rainy and winter seasons.
- Natural regeneration of grasses by grasses seeds dispersal in summer.
- Brush woods are managed in proper way.

- Field staff taking good interest in grasses and weeds identifications and grasslands management.
- Weeds regeneration rate is faster in grasslands periphery.

Recommendations Achanakmar grassland C. No. 188 , 189

- Chrysopogon polyphyllus (Fulera) grass dominant need to collect the grasses seeds in next 46 days.
- Ageratum conyzoides weed dominant need to eradicate 2-3 times in a year.
- Dicanthium annulatum grasses seeds to be added in next May.

Achanakmar C. No. 121

Area more than 150 hectares

- Brushwood management in this winter and summer season.
- Enrichment of grasses seeds in May- June. **Achanakmar C. No. 149**
- Brush woods management.
- Grasses seeds collection in October - November- Dicanthiumannulatum , D. caricosum , Chloris , Bothrichloa , Themeda.
- Imperatacylindrica grass cutting near water body.

Jalda Relocated Site ; area 50 hectares

- 100 mtr periphery of grasslands weed eradication 2 times in year to stop the invasion of weeds.
- weeds eradication 2 times in year.
- Grasses seeds collection in October - November.
- Deenanath grass eradication in proper way.
- 10 grasses , 05 weeds herbarium preparation by field staff.
- grasses seeds collection - Themeda , Dicanthium , Ber , Chloris.--- 40-50

kg seeds collection in Nov. - Dec.

Bahod , 50 hectares:

- Grasses seeds collection in November- October- Bothrichloa , Dicanthiumannulatum , D. caricosum , Themeda , Ber , Setaria.

- Weeds eradication.
- To prepare 1 hectare grass seed bank by fencing.
- Maintain sample plots in proper way.
- Coixaquatica grass management - cutting.
- Brush woods management.

Bokrakachar , 50 hectares area :

- 100 mtr periphery of grasslands weed eradication 2 times in year to stop the invasion of weeds.
- weeds eradication 2 times in year.
- Grasses seeds collection in October - November
- grasses seeds collection - Themeda , Dicanthium , Ber , Chloris.--- 40-50 kg seeds collection in Nov. - Dec.

Samabrdasan , 50 hectare area-

- 100 mtr periphery of grasslands weed eradication 2 times in year to stop the invasion of weeds.
- weeds eradication Alternantherasessalis 2 times in year. After weeds removal add grass pulas at weed removed areas in November -October ▪ Grasses seeds collection in October - November

Grasses seeds collection - Themeda , Dicanthium , Ber , Chloris.--- 40-50 kg seeds collection in Nov.

Bakhal , 50 hectare area.

- Grasses seeds collection in October - November

Grasses seeds collection - Themeda , Dicanthium , Ber , Chloris.--- 40-50 kg seeds collection in Nov.

Kuba , 40 hectare area :

- 100 mtr periphery of grasslands weed eradication 2 times in year to stop the invasion of weeds.
- weeds eradication Alternantherasessalis 2 times in year. After weeds removal add grass pulas at weed removed areas in November -October ▪ Grasses seeds collection in October - November

Grasses seeds collection - Themeda , Dicanthium , Ber , Chloris.--- 40-50

kg seeds collection in Nov.

Grasslands Development & Management Plan For : Relocated sites of Protected Areas

Grasslands sites of the protected areas (Relocated areas) composed of natural grasses, weeds, small shrubs, woody climbers, parasites and wild leguminous plants. Such area soil is degraded by the grazing pressure of domestic cattle's and anthropogenic factors. The exotic weeds are invaded on large scale.

In protected areas the main objectives are :

- To manage the weed species in limited period.
- To know the natural grass flora distribution.
- To develop good heterogeneous grassland for herbivores.
- To reduce the woodland species.

Management Practices (Plan for the Development of grasslands)

- Collection and burning of weed species. (May)
- Addition of Browsing bamboo species along the boundaries of village area. (June- July)
- Addition of wild fruit trees by grid line randomly. (July)
- Addition of annual / perennial palatable grasses in plough areas by seed broadcasting. (Duration : May – 25th to 30th)
- Management of natural water bodies by de-siltation.
- Weed Eradication programme : 1) June – July for new weed comers.

2) September –October : weed removal before flowering stages.

3) December – January : removal of succulent weeds .

- Seed collection of grasses in October - November and wild legumes.
- Weed removal: for continuous three years in proper period which will be useful for reduction of weed species.
- Prepare the grass seed bank of two hectares by fence to develop the grass seed plot.

After relocation : collect the grass seeds from the different locations in November – December , and broad cast the seeds in next pre monsoon period**.**

Grassland Management Recommendations Report Similipal Tiger Reserve (Orisa State) Debridarh Wild Life Santuranry, Orisa

Date of visit : 19th to 20th March 2022

Grassland Management observations in Similipal Tiger Reserve

Grasslands of Similipal Tiger Reserve are of heterogeneous type with three types of grasslands : Smaller , intermediate and taller grasslands with 70% palatable and 30% non palatable grasses. The grasslands possesses 45% perennial palatable grasses and 55% annual fodder grasses with browsing species. The grasslands comprises very few wild leguminous plants. Most of the grasslands invaded by the weeds. Each grassland invaded with woody species.

Landscape and topography

Soil with red sandy clay and loam, soil with good water holding capacity , undulating part with clay at lower side Rainfall moderate to high in rainy season, humidity percentage more , wind speed moderate to high **. Observed grasslands sites**

1. Jamuna Rehabiliated village --- 40 hectare
2. Pondabondha
3. Jorandha grassland
4. Kijhari
5. Chahala
6. Jenabil -------132 hectare

Jamuna Rehabiliated village meadow

Observations

- Rehabiliated village in 2021-22, after rehabilitation the cultivated lands are the good source of grassland development, natural.
- Jamuna nala is a source of water – perennial source.

-

Area to develop in grasslands Grassland : 40 Hect.

- Soil red with 65 % clay.
- Cultivated fields – paddy and mustard.
- Local distribution of native fodder grasses.
- Dhabh grasses taller, perennial, course grass.
- Low population village with – 29 .
- Cattles – 111.
- Wild fruit trees –Ziziphus , Tamarind , Amala , Amaltash , Terminalia.
- Jamuna village cultivated lands Grassland : 274 Hect area.

Important grassland of Similipal Tiger Reserve

1. Taller, intermediate grassland, with weeds.
2. Grasses : Themeda, Heteropogon, Dicanthium, Iselima, Ischemum, Cynodon, Digitaria, Elusine, Chloris, Setaria etc.
3. Wild fruit trees like Ber.
4. Browsing species Bahunia.
5. Roadside grasses.
6. Wild tur dominant in grassland
7. Dominant grasses are Themeda, Ischemum, Dicanthium, cynodon, Heteropogon.
8. Average Rainfall per year – 1500- 1700 mm.
9. Humidity – 65- 90 %.

Recommendation's

- Weeds uprooting two times per year – September and October before flowering , fruiting weeds to be uprooted.
- Brush woods management to reduce woody species but conserve fruit trees.
- Prepare inspection path of standard size in each grassland.
- Management of resting habitat.

- After uprooting of unwanted non fodder weeds – Ecological Restoration by grasses seeds Dicanthium , Heteropogon , Cynodon , Digitaria.

  5-7 kg grasses seeds per hectare in first year , 4-5 kg grasses seeds in second year and 2-3 kg grasses seeds in third year.

- Grasses seeds enrichment period may last week to June second week.
- Grasses selection for seed collection are Dicanthium annulatum, D. caricosum, D. tuberosum, Themeda quadrivalvis, Iselima, Setaria.
- Weeds uprooting should be stated around periphery of Meadow.
- Preparation of fire line and inspection path.
- Observe composition of grassland in October –November.
- Grasses seeds collection in November to February is most important.
- Brushwood management to maintain the area of grassland.
- Proper management of weed after removal.
- Manage resting habitat in meadow.
- Cynodon grass is dominant suitable for spotted deers a soft , perennial , palatable grass.
- Prepare 1-2 hectare grasses nursery model plot near jamuna nala with top 10 grasses plota with display board of each grass.
- Display of board of rehabillated village with important data.

Grassland / Meadow Development Plan

- Geo-mapping of grasslands----March or April. Soil observation – color , texture ---March.
- Grasslands observation…Aug to October.
- Grasses identification at flowering stages with local names---Sept or October.
- Weeds identification …. July.
- Weeds uprooting and proper management …..July -- September.
- Wild leguminous plants identification …September.
- Grasses herbarium preparation by frontline staff… Oct. or Nov.
- Identification of grazing and browsing species.

- Grasses restoration after removal of weeds or Lantana ,,,,, June – August.
  Grasses seeds collection ….Nov to Feb. Grasses seeds drying and storage.
- Grasslands enrichment by observing wildlife movements in grasslands…..May last week or June first week.
- Brushwood management to reduce woody species but unwanted with reference to site specific interventions as per suitability except hidden habitat to save.
- Documentation of interventions in each season.
- Biomass management in perennial taller grasses in mosaic pattern----season –October.

Chahala Grassland

Area of grassland	:	4 Hectare
Grasslands composition :		Themeda quadrivalvis : 5-8 %
		Imperata cylindrica : 90 %
		Chrysopogon polyphyllus : 1 %
Type of grassland	:	Taller
Brushwoods	:	4-5 %

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding
3. December : III rd Weeding : Weeding before fruiting stages of the plants.
4. Imperata grass cutting : two times in year : Season of cutting : 1) JULY – AUGUST 2) Nov. – Dec.
5. Brushwood cutting from the periphery of the grassland : July season. 6. Wild legumes addition.

A) Jenabil Grassland : Area of grassland :110 Hectare Jenabil to Hathighar Roadside Meadow (Left side part) Composition of Grassland

Imperata cylindrica	:	60-70 %
Themeda quadrivalvis	:	10 %
Bothriochloa bladhi	:	10-15%
Chrysopogon polyphyllus	:	5 %
Setaria pumilla	:	1-3 %
Type	:	Taller

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding
3. December : III rd Weeding : Weeding before fruiting stages of the plants.
4. Imperata grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY – AUGUST 2) Nov. –Dec.
5. Brushwood cutting from the periphery of the grassland : July season.
6. Waterlogged area of grassland no intervention.

B) Jenabil to Hathighar Roadside Meadow (Right side part) Composition of Grassland

Imperata cylindrica	:	less than 5 %
Digitaria abludens	:	1-2 %
Bothriochloa bladhi	:	10-15%
Chrysopogon polyphyllus	:	5 %
Setaria pumilla	:	1-3 % Paspaladium
flavedium : 1%		
Type	:	Taller

Management Action Plan Recommendations

1. Seed collection of Bothriochloa : November December 2.

Brushwood cutting from the periphery of the grassland : July season.

C) Jenabil to Hathighar Roadside Meadow (Towards stream Left part of the grassland) Composition of Grassland

Imperata cylindrica	:	less than 5 %
Bothriochloa bladhi	:	10-15%
Chrysopogon polyphyllus	:	5 %
Setaria pumilla	:	1-3 %

Paspala scorbioides (Kodo) Cyperus dominant	:	5-7%
Arachene racemosa	:	1%
Eragrostellia biferia (Non palatatable with silica)	:	60-80 %
Eragrostis verticellata	:	1%
Sacciolepis intermedia	:	2%
Smithia conferata	:	Dominant in marshy places
Saccharum spontanium	:	Dominant towards upper part of stream
Type	:	Taller

Management Action Plan Recommendations

1. July – August :Cutting of taller grtaases
2. Imperata grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY – AUGUST 2) Nov. –Dec.
3. Brushwood cutting from the periphery of the grassland : July season.
4. Waterlogged area conservation of smithia
5. Cutting of Saccharum spontanium : Dominent towards upper part of stream

D) Jenabil to Hathighar Roadside Meadow (Towards stream RIGHT part of the grassland)
Composition of Grassland

Imperata cylindrica	:	70-80 %
Cyperus	:	10 %
Paspalum (Kodo)	:	5 %
Arachene racemosa	:	1%
Eragrostellia biferia (Non palatatable with silica)	:	2-5 %
Sacciolepis intermedia	:	2%
Smithia conferata	:	Dominant in marshy places
Bothriochloa bladhi	:	10-15%
Chrysopogon polyphyllus	:	5 %
Setaria pumilla	:	1-3 % Paspaladium
flavedium	:	1%
Type	:	Taller

Management Action Plan Recommendations

1. Grassland cutting in mosaic pattern : Season 3 times in year.

Hathighar Meadow : 2.5 Hectare area.

Composition of Grassland

Imperata cylindrica	:	70-80 %
Paspalum (Kodo)	:	5 %
Saccharum spontanium	:	1%
Eragrostis gigantea	:	0.5 %
Sacciolepis intermedia	:	1- 2%
Themeda	:	1%
Chrysopogon polyphyllus	:	1-2 %
Setaria pumilla	:	1-3 %
Paspaladium flavedium	:	1%

Management Action Plan Recommendations

1. July – August :Cutting of taller grasses
2. Imperata grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY – AUGUST 2) Nov. –Dec.
3. Brushwood cutting from the periphery of the grassland : July season. 4. Cutting of Saccharum spontanium : Dominent towards upper part of stream 5. After cutting of taller grasses : weeding is necessary.

Watch tower Meadow Composition of Grassland

Imperata cylindrica	:	70-80 %
Paspalum (Kodo)	:	5 %
Saccharum spontanium	:	1%
Themeda	:	1%
Chrysopogon polyphyllus	:	1-2 %
Paspaladium flavedium	:	1%
Coix aquatica	:	near stream

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding
3. December : IIIrd Weeding : Weeding before fruiting stages of the plants.

4. Imperata grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY – AUGUST 2) Nov. –Dec.
5. Brushwood cutting from the periphery of the grassland : July season.
6. Waterlogged area of grassland no intervention.

Jenabil Grassland Mgt General Guidelines

1. Cutting of taller grasses : July , October and January
2. Weeding after cutting of grasses. Bothriochloa seed collection.
3. Paspalum (Kodo) Grass seed collection.
4. Setaria pumilla seed collection.
5. Digitaria abludens grass seed collection.

Jamuna Garh Relocated Village Guidelines for good grassland Development

1. Enlist of grasses .
2. Weeds enlist.
3. Weeding in proper periods.
4. 3-4 times weeding in a year.: July , October and December.

UBK Grasslands Kankadajodi grasaslands : 06 Hectares area Composition of Grassland

Imperata cylindrica	:	10 %
Paspalum (Kodo)	:	1 %
Saccharum spontanium	:	80-85%
Themeda laxa	:	5%
Chrysopogon polyphyllus	:	1-2 %
Apluda mutica	:	1%
Setaria pumilla	:	1-2 %

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding
3. Imperata and Saccharum grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY –AUGUST 2) Nov. –Dec.
4. Brushwood cutting from the periphery of the grassland : July season.
5. Bamboo 15-20 plants addition in August.

6. Wild fruit trees Aegle and Sygizium plants addition.

MATUGHAR GRASSLAND Area: 14 hectre Composition of Grassland

Imperata cylindrica	:	25-40 %
Paspalum (Kodo)	:	1 %
Saccharum spontanium	:	2-5%
Themeda laxa	:	25%
Themeda quadrivalvis	:	1%
Chrysopogon polyphyllus	:	1-2 %
Apluda mutica	:	1-5%
Setaria pumilla	:	1-2 %

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding
3. Half area of the grassland from TOONA CILIATA TREE Imperata and Saccharum grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY –AUGUST 2) Nov. –Dec.
4. Brushwood cutting from the periphery of the grassland : July season.
5. Bamboo , 100 plants addition in August.

DEOSTHALI GRASSLAND AREA : 25 Hectare Composition of Grassland

Imperata cylindrica	:	2-7 %
Paspalum (Kodo)	:	1 %
Saccharum spontanium	:	20%
Themeda laxa	:	15%
Themeda quadrivalvis	:	10%
Chrysopogon polyphyllus	:	1-2 %
Setaria pumilla	:	1-2 %
Cynodon barbei	:	5-7 %
Weeds dominant	:	Scoparia near Beat house

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding

3. IIIrd Weeding : December
4. Saccharum grass cutting in mosaic pattern : two times in year : Season of cutting : 1) JULY – AUGUST 2) Nov. –Dec.
5. Brushwood cutting from the periphery of the grassland : July season.
6. Bamboo , Bahunia bushes , 100 plants addition in August.
7. Themeda , Heteropogon grasses rhizomes addition**.**

UBK Grasslands : 13 Hectare area
Type of grassland : smaller and intermediate.

Composition of Grassland

Imperata cylindrica	:	1-2 %
Paspalum (Kodo)	:	1 %
Saccharum spontanium	:	2%
Themeda laxa	:	1%
Themeda quadrivalvis	:	1%
Chrysopogon polyphyllus	:	2-6 %
Setaria pumilla	:	1 %
Cynodon barberi	:	5-8%
Sporobolus dinder	:	0.5 %
Paspaladium flavedium	:	5%

Management Action Plan Recommendations

1. July – August : Ist weeding
2. October : IInd Weeding
3. IIIrd Weeding : December
4. Brushwood cutting from the periphery of the grassland : July season.
5. Bamboo, 100 plants addition in August.
6. Cynodon enrichment in weed uprooted areas.
7. Soil Moisture Conservation near Gully road side areas.

TARINIVILLA GRASSLAND

1. Woody species like Vitex , Casearia , play vital role in hidden habitat of wildlife management practices.
2. Uprooting of Plectranthus . Andropogon citrates from the grasslands .

3. 1-2 grasses cutting in proper periods.
4. Critical wildlife habitat of STR.

North Similipal Grasslands Management Recommendations

- Observe the composition of natural grassland.
- Soil texture , color , water holding capacity
- Identify the local fodder grasses
- Grasses seeds collection ---- November to February Enrichment of shade tolerant palatable grasses
- Grasses enrichment by seeds or grasses rhizomes.
- Demarcation and polygon of each grassland.
- Brushwood management every year after winter season.
- Kijhari 39 hectare grassland or meadow rehabilitated area in 2016 :1) More grasses diversity 2) 80% grasses perennial palatable 3) dominant grasses are – Dichanthium annualatum , Dicanthium caricosum , Dicanthium persutum , Choris barbata , Cholris virgate , Iselima laxum , Bothriochloa persutum , B. tuberosum , Cynodon barberi 4) seeds collection in more % in November to February 5) prepare grasses nursery for seeds collection.
- Arrange workshop on meadow development 2 times per year Maintain grasslands management register in every season

Common recommendations Meadow / Grasslands Management

- Conserve old grasslands by proper management interventions
- Weeds eradication before fruiting
- Uproot weeds along roadside as well as from inside grasslands
- After weeds eradication – restoration by good grasses with suitable grasses.
- Brushwood management in suitable season
- Site specific interventions‘ required
- Identify grasses with local names
- Ecological restoration by grasses seeds
- Monitoring of grasslands season wise
- Documentation of management interventions
- Training for frontline field staff 2 times per year.
- Geo-mapping of each grassland
- Biomass management in mosaic pattern.

Govt.of MadhyaPradesh
मध्य प्रदेश शासन

Office of the Field Director

Panna Tiger Reserve

Panna, Madhya Pradesh, (India)
Phone No. +917732-252135 (O) Fax, +917732-252120
E-mail: fdpnp.pna@mp.gov.in, Website: www.pannatigerreserve.in

Panna Tiger Reserve
पन्ना टाईगर रिजर्व

Sub.- Appreciation letter.
No./Sr.PA/2021/ 257
Panna Dated 15.02.2021

To,

Prof. G.D. Muratkar
Head Department of Environment Science,
Arts, Science & Commerce College,
Chikhaldara, Distt. Amravati (Maharastra)

Dear Dr. Muratkar,

Directorate of Panna Tiger Reserve acknowledges and appreciate your effots made and cooperation extended to develop the new grassland and improve the existing ones in Panna Tiger Reserve . You have been associated with Panna Tiger Reserve for a long time and your contribution in building and enhancing the capability of the field staff is praise worthy. The field workshop arranged and organized by Panna Tiger Reserve and guided by you in management of grasslands, identification and removal of weed and collection grass seeds, wild legume have helped in improving the existing grassland habitats for the wild herbivores. The services given by you for Panna Tiger Reserve are excellent and it is a great contribution for the cause of tiger conservation in particular and wildlife conservation in general. We convey our sincere thanks and gratitude to you by issuing this appreciation letter.

(Uttam Kumar Sharma)
Chief Conservator of Forests and Field Director,
Panna Tiger Reserve Panna

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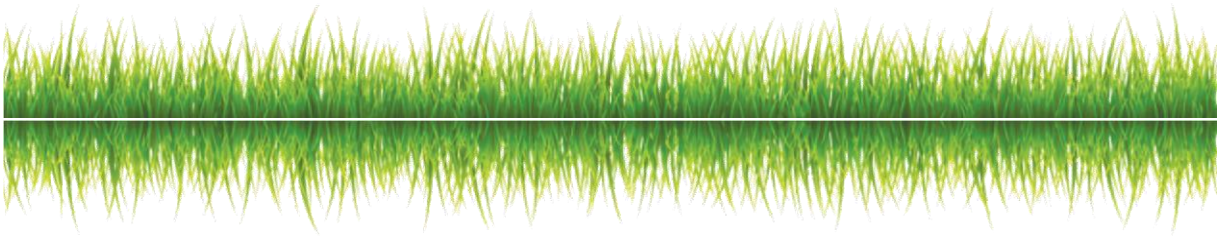

MAHARASHTRA STATE
FOREST DEPARTMENT

OFFICE OF THE CONSERVATOR OF FORESTS & FIELD DIRECTOR,
TADOBA-ANDHARI TIGER RESERVE, CHANDRAPUR

Mul Road, Chandrapur 442401
Phone No. (07172) 251414
E-Mail ccffdtadoba2@mahaforest.gov.in

By Email
Desk no – 4/Steno/2022-23/ 549

Chandrapur, Date 30/05/2022

Sir,

Subject :- Letter of appreciation

On behalf of Tadoba-Andhari Tiger Reserve, Chandrapur, I place on record our sincere appreciation towards Prof. G. D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Tadoba-Andhari Tiger Reserve. He has conducted field visits and conducted on field training and workshops involving Forest officials from the cadre of Forest Beat Guards to Field Director on the grassland management, Wild legume identification, grass seed collection and weed eradication on dated 07/05/2022 and 08/05/2022.

This has resulted in visible change in different grasslands spread over this Tiger Reserve and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

(Dr. Jitendra S. Ramgaokar, IFS)
Conservator of Forests & Field Director,
Tadoba-Andhari Tiger Reserve, Chandrapur

To,
The Principal,
Arts Science and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State-444 807

Magical Melghat
☎(07258) 203711

उपवनसंरक्षक, मेळघाट व्याघ्र प्रकल्प, आकोट वन्यजीव विभाग, आकोट यांचे कार्यालय.
कार्यालय- पोपटखेड रोड, आकोट, जि.अकोला, पिन को.नं. 444101
ई-मेल dcf.akot@yahoo.com ; dycfwlakot@mahaforest.gov.in

पत्र

विषय:- धारगड येथे कुरण विकास व गवत प्रजातीचे ओळख याबाबत कार्यशाळा आयोजीत करणेबाबत.

क्रमांक:- शि.ली.1//266A /2021-22

आकोट, दिनांक:- 12/11/21

प्रति,

डॉ. गजानन डी. मुरतकर, प्राध्यापक,
सिपना महाविद्यालय,
चिखलदरा.

संदर्भ:- या कार्यालयाचे पत्र क्र.शि.ली.1/808/दिनांक 26/08/2021 अन्वये

*****

उपरोक्त संदर्भिय पत्राचे अनुषंगाने कुरण विकास व गवत प्रजातीची ओळख या विषयावर आपले मार्गदर्शनाखाली धारगड परिक्षेत्राअंतर्गत धारगड सभागृह येथे दिनांक 30/08/2021 रोजी कार्यशाळा आयोजीत करण्यात आलेली होती.

तसेच आज़ादी का अमृत महोत्सव व पक्षी सप्ताह निमित्य क्षेत्रीय कर्मचारी यांना गवत प्रजातीची ओळख व गवत बि संकलन करणे या विषयावर धारगड परिक्षेत्राअंतर्गत धारगड सभागृह येथे दिनांक 14/11/2021 रोजी कार्यशाळा आयोजीत केलेली आहे.

तरी सदर कार्यशाळेस आपण उपस्थित राहुन क्षेत्रीय कर्मचारी यांना मार्गदर्शन करावे हि विनंती.

एस. नवकिशोर रेड्डी (भा.व.से.)
उपवनसंरक्षक,
मेळघाट व्याघ्र प्रकल्प,
आकोट वन्यजिव विभाग, आकोट

प्रतिलिपी:- मा.मुख्य वनसंरक्षक तथा क्षेत्रसंचालक मेव्याप्र, अमरावती यांना महितीस सविनय सादर.

gÝ‘mZnÌ

Government of Maharashtra
Forest Department

Office of Conservator of Forests & Field Director, Tadoba Andhari Tiger Reserve, Chandrapur

Tel No. (07172) 251414, 277116
E-mail- ccffdtadoba2@mahaforest.gov.in/ ccf_fdtatr@rediffmail.com
Mul Road, Chandrapur-442401

No: Desk-4/Steno/2021-22 2612 Chandrapur Dt. 31/1/2022

To,

Dr. G.D. Muratkar
Head,
Department of Enviromental Sciences
Art, Science & Commerce College.
Chikhaldara.

Subject :- Conducting ecological study of grasses of Tadoba Andhari Tiger Reserve Regarding.

Reference :- Deputy Director (Core), TATR Letter No. 984/2021-22 dated 31/01/2022.

Respected Sir,

As you are aware, we at Tadboa Andhari Tiger Reserve Chandrapur, are working extensively to make Tadoba Tiger Reserve free from invasive weeds and also to restore degraded grasslands by promoting native species of grasses. We have received valuable guidance from you from time to time to carry out this important work by following sound scientific practices. We are also working on developing degraded areas vacated by villages that have been relocated outside the park. We want to document this work and also conduct study on the grass species available in Tadboa Andhari Tiger Reserve and its ecological aspects.

Considering your technical expertise in the field of grasses and your continuos guidance to field staff and officers of Tadboa Andhari Tiger Reserve, we would like to request you to take up a separate study on ecology of grasses in Tadboa Andhari Tiger Reserve Chandrapur.

This will help the management take informed habitat management decisions in future and restore all degraded areas of the park and outside to their full ecological potential as habitat for wildlife.

(Dr. Jitendra Ramgaokar)
Conservator of Forests & Field Director,
Tadoba Andhari Tiger Reserve,
Chandrapur

Copy to : Deputy Director (Core), TATR Chandrapur for information with regards to letter under reference.

gÝ‘mZnÌ

P.V. RAJA RAO, IFS
Director /CCF &
Secretary, CEFNARM

Telangana State Forest Academy
Government of Telangana,
Dulapally, Hyderabad – 500 100
Land Line (O) : 040 – 29 70 48 96
Mob : + 91 94 40 81 01 66
e-mail : tsfa.hyd@gmail.com
peshi.tsfa@gmail.com

LETTER OF APPRECIATION

The Telangana State Forest Academy, sincerely appreciates Prof. Gajanan Dadaraoji Muratkar of Maharashtra for the vast & exhausting knowledge on Grasslands.

Prof. Muratkar delivered very information & exhaustive lecture on Zoom webinar as a part of online lectures to the Forest Range Officer trainees VIII Batch (batch comprises trainees of Uttar Pradesh, West Bengal & Karnataka) on 22nd February 2022.

It was a splendid presentation besides interaction with the Forest Range Officer trainees exposing them to various kinds of Grass species coupled with identification tips for identification in the field.

Your eloquent sharing on "Grassland Development and Management" was fully appreciated and the trainees got benefited from your views and vast experiences in the field of Grassland Management.

Looking forward to your cooperation for promotion and imparting further professional expertise in future as well.

with best regards

Yours sincerely

(SRI P. V. RAJA RAO, IFS)
Director/CCF

To
Prof. Gajanan Dadaraoji Muratkar
Head, The Botany and Environmental Science Department of the Arts, Science and Commerce College at Chikhaldara, Maharashtra State

GOVERNMENT OF TELANGANA
T.S. FOREST DEPARTMENT
Telangana State Forest Academy
Dulapally, Hyderabad – 500 100

From

Sri P.V. Raja Rao, IFS.,
Director / Chief Conservator of Forests,
T.S. Forest Academy,
Dulapally, Hyderabad – 500 100

To

Dr. G.D. Muratkar, Prof.,
Chilkadara
Maharashtra.

RC.No.729/2021/E2, Dt.28.05.2021

Sir,

Sub: TSFA, Dulapally – 2020-22 (7th Batch) - 18 Months induction training to "Forest Range Officer Trainees" at T.S. Forest Academy, Dulapally, Hyderabad – Proposed study tour to **West-Central India Tour on virtual mode** w.e.f 21.06.2021 to 07.07.2021 (15 days) –Approval – Requested - Regarding.

****

I submit to state that the Telangana State Forest Academy, Dulapally, Hyderabad has planned to conduct **Virtual West Central India Study Tour for 2020-22 (7th Batch) of Forest Range Officer trainees** (63 trainees including 17 lady officer trainees) from 21.06.2021 to 07.07.2021 (15 days). Due to the escalation of the COVID cases and Pandemicity throughout the country and as discussed with Directorate of Forest Education, it is decided to conduct the proposed West Central India Study tour **through Virtual Mode**. In this regard a Virtual Mode tour schedule has been prepared and enclosed in the annexure for information and further action.

Virtual tour will be conducted in **Zoom platform**. The link will be shared in advance and will be hosted by Telangana State Forest Academy, Dulapally, Hyderabad on the following topic.

Date	Time	Proposed activity
29.06.2021 (Tuesday)	03.00 - 04.30	Grass Land Management - Interaction with Dr. Murathkar, Prof.

In order to coordinate with the Officers concerned the following officers is nominated **as Nodal Officer** at T.S. Forest Academy, Dulapally, Hyderabad.

Sl. No.	Name of the Officer	Designation	Contact No.	Email ID
1.	Sri V. Anjaneyulu	Dy. Director / Course Director, 7th Batch (2020-22) FRO – ITP TSFA, Dulapally.	9440815595	vanjaneyulu.tsfa@gmail.com

DEPARTMENT OF CHEMISTRY
SANT GADGE BABA AMRAVATI UNIVERSITY
(Reaccredited with 'A' Grade by NAAC)

Dr. A. S. Aswar
Senior Professor & Head
Coordinator, Avishkar Cell
Ex-Scientist In-Charge
Industrial & Applied Chemistry

Phone : 0721-2662279 Ext 262
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Fax: 0721-2662135, 2660949
E-mail: aswaranand@gmail.com
Amravati-444602 (M.S.), India

Date : 5/03/2022

Ref. No.: Chem/45/2022

To,
Dr.G.D.Muratkar
Arts ,Science and Commerce College, Chkhaldara

Subject: **Regarding Invited talk in the NWNSDT-2022 during March 12-13, 2022**

Dear Madam,

Greetings from SGB Amravati University, Amravati!
It is my pleasure to inform you that the Department of Chemistry, Sant Gadge Baba Amravati University, Amravati in collaboration with NASI, Prayagraj and Arts ,Science and Commerce College, Chkhaldara is organizing a "National Workshop on "Nature & Science for Socio-economic Development of Tribal Regions" (NWNSDT-2022) during March 12-13, 2022 at Muthawa Community Resource and Research Centre, Kotha Tq. Dharni ; Dist. Amravati The scope of the workshop has been kept broad based with the intention that young research scholars and PG students can get exposed to the contemporary topics of research Phytochemistry/ Biodiversity and Conservation of Medicinal Plants in general and Traditional use of herbal medicines /Propagation and Management of plants in particular.

In view of your wide experiences and valuable contributions in the field of phytochemicals analysis and allied areas, I, on behalf of the organizing committee and on my own, invite you to kindly deliver an Invited Talk of 45 minutes on 'Biodiversity, local medicinal plants and their traditional uses or **on the topic of your interest relevant to the theme of workshop**. Your talk will certainly help our students to widen the horizon of their knowledge in the area of phytochemistry chemical biology; extraction methodologies, characterization techniques, and therapeutical potentials medicinal plants and boost their confidence towards improving their economic empowerment.

Hoping, for your active participation at NWNSDT-2022 and make the program a grand success. The organizing committee is delighted to provide your local hospitality.

Looking forward to listen to you at NWNSDT-2022 & a line of confirmation shall be highly appreciated.
With best Regards
Sincerely Yours,

(A.S.Aswar)
Convener, NWNSDT-2022

महाराष्ट्र शासन
वन विभाग

मुख्य वनसंरक्षक, चंद्रपूर वनवृत्त, चंद्रपूर यांचे कार्यालय

सिव्हील लाईन नागपूर रोड, चंद्रपूर - 442401 (म.रा.)
दुरध्वनी नं. 07172-256279 फॅक्स नं. 07172-252232 E-mail: ccfchandrapur@gmail.com

E-mail व्दारे

क्रमांक कक्ष -2(1)/योजना/2022-23/ 1136 चंद्रपूर दिनांक :4 /07/2022

विषय- वनक्षेत्रात कुरण विकास कार्यशाळा आयोजीत करणे बाबत.

उपवनसंरक्षक, मध्य चांदा वनविभाग यांना कळविण्यात येते की, चंद्रपूर जिल्हयात मानव - वन्यजीव संघर्षाचे तिव्र स्वरुप लक्षात घेता तृणभक्षी जनवरांसाठी खादयाची कमतरता लक्षात घेता कुरण विकास प्रकल्प राबविणे आवश्यक आहे. याबाबत मा.प्रधान सचिव (वने) मंत्रालय, मुंबई यांनी सभेत निर्देश दिले आहेत. या प्रकल्पात चारा निर्मीती करुन तृणभक्षी प्राण्यांना खादय पुरविणे तसेच सभोवतिलच्या गावातील लोकांच्या जनावरांसाठी चारा पुरवठा करणे हे उद्देश अभिप्रेत आहे .या दृष्ठिकोनातून चंद्रपूर जिल्हयांसाठी एकात्मिक विकास प्रकल्प (Perspective plan) राबविण्याबाबत मा.मुराटकर,सर (गवत तज्ञ) यांना सप्टेंबर/2022 मध्ये कार्यशाळा आयोजित करण्यांबाबत दिनांक कळविण्यांत यावे,

तसेच मा.मुराटकर, सर गवत तज्ञ यांचा मोबाईल नंबर 8975750202/9423426805 व ई.मेल आयडी (gmuratkar@gmail.com/ Gmuratkar@gmail.com यांचेशी संपर्क साधावा.

(प्र. ज. लोणकर)
मुख्य वनसंरक्षक,
चंद्रपूर वनवृत्त, चंद्रपूर

प्रति,

उपवनसंरक्षक,
मध्य चांदा वनविभाग

प्रतिलीपी :- श्री. मुरटकर, सर गवत तज्ञ यांना माहिती व आवश्यक कार्यवाहीस अग्रेषित.

OFFICE OF THE DEPUTY DIRECTOR,
SIMILIPAL SOUTH WILDLIFE DIVISION, BARIPADA

PHONE:06792-259126, FAX:06792-256705, e-mail: ddsimilipal.od@gov.in

Letter No. 658 /4F

Dated, Baripada the 11th March,2022

To

Prof. Dr. G.D. Muratkar
Grass Expert,
Head Department of Environment Science
Arts Science and Comm. College,
Chikhaldara, Amravati
Maharashtra. PIN- 444807

E-mail : gmuratkar@gmail.com.

Sub: Training to the frontline staff of Similipal Tiger Reserve, Odisha, on "Meadow Development & Management"

Sir,

In inviting a reference to the above noted subject, it is decided to organize a capacity building training programme for Field Staff of Similipal Tiger Reserve, Odisha on "Meadow Development and Management" on 19.03.2022 and 20.03.2022. Hence, you are requested to impart training to the frontline staff as Expert Trainer in the above event. Your boarding and lodging will be borne by Forest, Environment & Climate Change Department, Govt. of Odisha.

An early confirmation is requested.

Yours faithfully

Deputy Director
Similipal South WL Division, Baripada

Memo No. 659 / Dt. 11.03.2022

Copy forwarded to the Field Director, Similipal Tiger Reserve-Cum-Regional CCF, Baripada for favour of information.

Deputy Director
Similipal South WL Division, Baripada

Memo No. 660 / Dt. 11.03.2022

Copy forwarded to the Deputy Director, Similipal North WL Division, Jashipur for information and necessary action.

Deputy Director
Similipal South WL Division, Baripada

महाराष्ट्र शासन
महसुल व वन विभाग
प्रधान मुख्य वनसंरक्षक, महाराष्ट्र राज्य, नागपूर यांचे कार्यालय.
O/o Principal Chief Conservator of Forests (HoFF), Maharashtra State
प्रधान मुख्य वनसंरक्षक (वन्यजीव) महाराष्ट्र राज्य
Principal Chief Conservator of Forests (Wildlife), Maharashtra State
"Van Bhavan" 3rd Floor, Ramgiri Road, Civil Lines, Nagpur 440 001
Phone - 0712-2549563
E-mail - pccfwlngp@mahaforest.gov.in
Website - www.mahaforest.gov.in

पत्र-ईमेल क्रमांक:- कक्ष-२३(२)/वजी/सर्वे/प्र.क्र.५२/CMO/१६९/२०२१-२२, दिनांक:- **०३/०८/२०२१**

प्रति,

१) प्रधान मुख्य वनसंरक्षक (उत्पादन व व्यवस्थापन), म.रा.
२) प्रधान मुख्य वनसंरक्षक तथा मुख्य कार्यकारी अधिकारी (महा कॅम्पा), म.रा.
३) श्री. एस.बी. बडवे, वनसंरक्षक (सेवानिवृत्त), पुणे.
४) श्रीमती केतकी घाटे, (OIKOS), पुणे.
५) डॉ. गजानन मुरतकर, चिखलदरा.
६) श्री. मिहीर गोडबोले, (Grassland Trust), पुणे.
७) श्री. कौस्तुभ पंढरीपांडे, वर्धा.

विषय :- राज्यातील शुष्क प्रदेशातील गवताळ प्रदेश/कुरण अधिवासाचे आणि जैवविविधतेचे संवर्धन करण्याबाबत आभासी कार्यशाळा व चर्चा.

संदर्भ:- १) या कार्यालयाचे पत्र क्र. कक्ष-२३(२)/वजी/सर्वे/प्र.क्र.CMO/८१७, दि. २०/०७/२०२१.
२) या कार्यालयाचे पत्र क्र. कक्ष-२३(२)/वजी/सर्वे/प्र.क्र.CMO/८३१, दि. २०/०७/२०२१.

राज्यातील विविध क्षेत्रात उत्तम गवताळ क्षेत्र/कुरणे नैसर्गिकरित्या आढळून येतात. अशा क्षेत्रातील अधिवासात एक विशिष्ट प्रकारची जैवविविधता दिसून येते. ह्या गवताळ प्रदेशाचे व कुरणांचे संवर्धन करण हे अत्यंत महत्त्याचे आहे. त्यांचे जतन करणे व संवर्धन करणे ह्यासाठी कशा प्रकारे नियोजन करावे ? या करीता संदर्भिय पत्र-१ अन्वये आभासी कार्यशाळा व चर्चा आयोजित करण्यात आली होती. तथापि काही अपरिहार्य कारणास्तव सदर कार्यशाळा संदर्भिय पत्र-२ अन्वये पुढे ढकलण्यात आलेली होती.

आता आपणांस याद्वारे कळविण्यात येते की, दिनांक ११ ऑगस्ट २०२१ रोजी संध्याकाळी ४.०० वाजता आभासी कार्यशाळा व चर्चा आयोजित करण्यात आली आहे. करीता उपरोक्त चर्चेकरीता सहभागी व्हावे व आपले मौलिक विचार मांडावे, हि विनंती.

या कार्यशाळेची लिंक वेगळयाने पाठविण्यात येईल.

3/8/20

(सुनील लिमये)
प्रधान मुख्य वनसंरक्षक (वन्यजीव),
महाराष्ट्र राज्य

प्रतिलिपी :- प्रधान मुख्य वनसंरक्षक (माहिती तंत्रज्ञान व धोरण), म.रा. यांना माहिती व उचीत कार्यवाहीस सस्नेह अग्रेषीत. सदर कार्यशाळेकरीता आपले स्तरावरुन लिंक तयार करुन देण्यात यावे, हि विनंती.

Magical Melghat
☎ (07258) 203711

उपवनसंरक्षक, मेळघाट व्याघ्र प्रकल्प, आकोट वन्यजीव विभाग, आकोट यांचे कार्यालय.
कार्यालय- पोपटखेड रोड, आकोट, जि.अकोला, पिन को.नं. 444101
ई-मेल dcf.akot@yahoo.com ; dycfwlakot@mahaforest.gov.in

पत्र

विषय:- धारगड येथे कुरण विकास व गवत प्रजातीचे ओळख यावाबत कार्यशाळा आयोजीत करणेबाबत.
क्रमांक:- शि.ली.1/ 757 /2021-22
आकोट, दिनांक:- 20/08/2021

सन 2021-22 मध्ये कुरण विकास व गवत प्रजातीची ओळख या विषयावर डॉ. गजानन डी. मुरतकर, प्राध्यापक यांचे मार्गदर्शनाखाली धारगड परिक्षेत्रातील धारगड सभागृह येथे दिनांक 27/08/2021 रोजी कार्यशाळा आयोजीत करण्यात आलेली आहे.

तरी वनपरिक्षेत्र अधिकारी सर्व यांनी आपले अधिनस्त ज्या ठिकाणी कुरण विकासाची कामे घेणार आहेत किंवा सुरु आहेत अशा क्षेत्रातील 02 वनरक्षक व 01 वनपाल यांना उपरोक्त कार्यशाळेकरीता उपस्थित राहणे बाबत सुचना देण्यात याव्या तसेच आपण सुध्दा सदर कार्यशाळेकरीता उपस्थित राहावे.

तसेच वनपरिक्षेत्र अधिकारी, धारगड यांनी धारगड सभागृह येथे दिनांक 27/08/2021 रोजी कार्यशाळेचे सर्व आयोजन करावे.

एस. नवकिशोर रेड्डी (भा.व.से.)
उपवनसंरक्षक,
मेळघाट व्याघ्र प्रकल्प,
आकोट वन्यजिव विभाग, आकोट

प्रति,
वनपरिक्षेत्र अधिकारी,
वान/सोनाळा/सोमठाणा/नरनाळा व धारगड.

प्रतिलिपी:- डॉ. गजानन डी. मुरतकर, प्राध्यापक, चिखलदरा यांना माहितीस अग्रेषित. त्यांनी उपरोक्त कालावधीत आयोजीत कार्यशाळेकरीता उपस्थित राहुन मार्गदर्शन करावे ही विनंती.
प्रतिलिपी:- सहायक वनसंरक्षक, वन्यजीव विभाग, आकोट यांना माहितीस व योग्य कार्यवाहीस अग्रेषित.

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE & BIO-DIVERSITY CONSERVATION) CUM-CHIEF WILDLIFE WARDEN CHHATTISGARH
Aranaya Bhawan, First Floor (FR) Sector 19, North Block, Capital Complex Atal Nagar, Nava Raipur
✉ cwlwcg@gmail.com (☎0771-2512880, 🖷 0771-2512881)

No./WL /Coord./.Q1..... Nava Raipur, Dated :..04/06/2021

Prof. Gajanan Dadaraoji Muratkar delivered a virtual lecture captioned *"Grassland management Techniques for the Protected Areas of Chhattisgarh"* on *4th June 2021* to the Officers and field staff working in the Protected Areas of Chhattisgarh.

The inputs in the session gave an insight into the timelines in which different activities from seed collection, treatment, pre-sowing and post sowing operations need to be carried out to develop grassland in order to increase the herbivores population. The department is thankful to him and looks forward to having many more such fruitful training sessions in the future also.

04/06/2021.

(P.V.NARSINGA RAO)
Principal Chief Conservator of Forest (Wildlife) and
Chief Wildlife Warden, Chhattisgarh State

S. R. NATESHA, IFS.,
CONSERVATOR OF FORESTS &
FIELD DIRECTOR

GOVERNMENT OF KARNATAKA

FOREST DEPARTMENT

No. A4/BUD/CR 17/Grassland/2020-21 Date: 25-01-2021

To,
Dr. Gajanan Muratkar,
Grass Expert and
Head of the Department Environment Science,
Arts, Science and Commerce College,
Chikaldara, Amaravati,
Maharashtra - 444807

Sub: Appreciation of Services rendered in Grassland Management in Bandipur Tiger Reserve, Karnataka – reg.

--*-*

This is with great pleasure that, I acknowledge and immensely appreciate your technical guidance for the development of grasslands in Bandipur Tiger Reserve and the contribution towards the capacity building of our field and supervisory staff.

Your recent visit on 26th December 2020 to Bandipur and your inputs given in the workshop with the management of Bandipur Tiger Reserve have considerably added to our understanding of the improvement and management of grassland. I hope that in future also you will lend us your tremendous support for the cause of conservation of grassland in Bandipur Tiger Reserve.

(S. R. Natesha, IFS.,)
Conservator of Forests & Field Director,
Project Tiger, Bandipur

Office of the Dy Conservator of Forests, Melghat Tiger Reserve,
Akot Wildlife Division Akot
Office- Popatkhed Road Akot, Pin Code No. 444101
E-mail- dcf.akot@yahoo.com

Desk No. GC/ 826 /2021-22 **Akot Date :- 15/9/21**

Sir,

Subject :- Letter of appreciation.

On behalf of Akot Wildlife Division , Melghat Tiger Reserve, I place on record our sincere appreciation towards Prof. G. D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Melghat Tiger Reserve. He has conducted field visits and conducted on field training and workshops involving forest officials from the cadre of forest Beat Guards to Deputy Conservator of Forests on the grassland management, wild legume identification, grass seed collection and weed eradication. This has resulted in visible change in our grassland management approach and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

S. Navakishore Reddy (I.F.S.)
Dy. Conservator of Forests,
Melghat Tiger Reserve
Akot Wildlife Division, Akot

To,

The Principal,
Arts Science and commerce College
Chikhaldara, Amravati District,
Maharashtra State 444807

OFFICE OF FIELD DIRECTOR, SATPURA TIGER RESERVE
Narmadapuram, (MP) 461 001
Email: fdsatnp.hbd@mp.gov.in **Ph:** 07574-254394 & **Fax:** 07574-252133

No. /Management/..5318 Narmadapuram, Date: ..16..6.22

To,

Prof. G. D. Muratkar
Department of Environmental Science
Arts, Science & Commerce College
Amaravati, Maharastra

Sub: Request for visit in recent relocation sites for grassland management in Satpura Tiger Reserve

Dear Prof Muratkar,

As you know that Satpura Tiger Reserve recently relocated Khamda & Suplai villages from the tiger reserve. During our past observations we found that this area has a potential site to become a good prey base for the carnivores. So Satpura Tiger Reserve planning to develop this area as a grassland site. So we need some baseline information regarding the grasses in that relocation site. So that we can practice the grassland management into the relocation site in near future.

You are requested to visit those relocation sites on 20 to 23 of June 2022.

Thanking you.

Sincerely,

(L. Krishnamoorthy, IFS)
Field Director, Satpura Tiger Reserve
Narmadapuram (MP)

Memorandum of Understanding

Memorandum of Understanding in Between Field Director and Chief Conservator of Forests Melghat Tiger Reserve , Amravati And Principal Arts , Science & Commerce College , Chikhaldara Talq. Chikhaldara , Dist Amravati 444807

Being Party of the First Part : Field Director and Chief Conservator of Forests Melghat Tiger Reserve , Amravati

Being Party of the Second Part : Principal Arts , Science & Commerce College , Chikhaldara Talq. Chikhaldara , Dist Amravati Where as Sipna Shikshan Prasarak Mandal , a public trust duly registered under the provision of Bombay Public Trust Act , 1950 , is running the Arts , Science and Comm. College Chikhaldara offers various courses in Arts , Commerce and Science streams for the students and also has expert faculties working in the college for imparting education to the students. And Where AS Chikhaldara comes under the Melghat tribal region , which is mainlly a forest area having rich biodiversity. The Party of the First Part requires the Honorary Consultation Services and Scientific , Technical support from the Department of Environmental Science and Botany in the field of 1) identification of Grasses of Melghat Tiger Reserve , 2) Classification of grasses in to Palatable and Non Palatable ,3) Weeds identification ,4) Wild leguminous plants identification 5) Grasses Seeds Collection ,6) Grassland Management Practices for the herbivores 7) Preparation of Action Plan for Grassland Management. And Where As Prof. G. D. Muratkar , Head Dept. of Environmental Science of the college offered his selfless valuable consultation services and technical support in grassland management practices for the relocated sites of the Melghat Tiger Reserve from the year 2012-13 to current period of the year 2016-17.The Field Director and Chief Conservator of the Melghat Tiger Reserve , Amravati requested to provide the expertise services of Prof. G. D. Muratkar on honoray baisis.And Where As looking to the nature of work and its benefit to the forest and grassland ecosystem , food chain for herbivores and carnivores in general the Principal , Arts , Science & Commerce College , Chikhaldara accepted the request of the Hon,ble Field Director and Chief Conservator of Melghat Tiger Reserve.

Prof. G. D. Muratkar and his team will carry out the following training programmes for the field staff of the Melghat Tiger Reserve in the suitable season specially in Sunday , Holidays and vacations without any remuneration.

1) Grasses identification. 2) Weeds identification 3) Wild Leguminous plants identification 4) Seeds collection , storage and broadcasting 5) Enrichment of grasslands 6) Field workshop for field staff 7) Ecological Impact Assessment of Relocated Villages sites of MTR.

Date: 28/12/2016

Principal
Arts , Science and Commerce College
Chikhaldara

Field Director and Chief Conservator of Forests
MELGHAT TIGER RESERVE, AMRAVATI

Memorandum of Understanding

Memorandum of Understanding in Between Field Director and Chief Conservator of Forests Melghat Tiger Reserve , Amravati And Principal Arts , Science & Commerce College , Chikhaldara Talq. Chikhaldara , Dist Amravati 444807

Being Party of the First Part : Field Director and Chief Conservator of Forests Melghat Tiger Reserve , Amravati

Being Party of the Second Part : Principal Arts , Science & Commerce College , Chikhaldara Talq. Chikhaldara , Dist Amravati Where as Sipna Shikshan Prasarak Mandal , a public trust duly registered under the provision of Bombay Public Trust Act , 1950 , is running the Arts , Science and Comm. College Chikhaldara offers various courses in Arts , Commerce and Science streams for the students and also has expert faculties working in the college for imparting education to the students. And Where AS Chikhaldara comes under the Melghat tribal region , which is mainlly a forest area having rich biodiversity. The Party of the First Part requires the Honorary Consultation Services and Scientific , Technical support from the Department of Environmental Science and Botany in the field of 1) identification of Grasses of Melghat Tiger Reserve , 2) Classification of grasses in to Palatable and Non Palatable ,3) Weeds identification ,4) Wild leguminous plants identification 5) Grasses Seeds Collection ,6) Grassland Management Practices for the herbivores 7) Preparation of Action Plan for Grassland Management. And Where As Prof. G. D. Muratkar , Head Dept. of Environmental Science of the college offered his selfless valuable consultation services and technical support in grassland management practices for the relocated sites of the Melghat Tiger Reserve from the year 2012-13 to current period of the year 2016-17.The Field Director and Chief Conservator of the Melghat Tiger Reserve , Amravati requested to provide the expertise services of Prof. G. D. Muratkar on honoray baisis.And Where As looking to the nature of work and its benefit to the forest and grassland ecosystem , food chain for herbivores and carnivores in general the Principal , Arts , Science & Commerce College , Chikhaldara accepted the request of the Hon,ble Field Director and Chief Conservator of Melghat Tiger Reserve.

Prof. G. D. Muratkar and his team will carry out the following training programmes for the field staff of the Melghat Tiger Reserve in the suitable season specially in Sunday , Holidays and vacations without any remuneration.

1) Grasses identification. 2) Weeds identification 3) Wild Leguminous plants identification 4) Seeds collection , storage and broadcasting 5) Enrichment of grasslands 6) Field workshop for field staff 7) Ecological Impact Assessment of Relocated Villages sites of MTR.

Date: 28/12/2016

Principal
Arts , Science and Commerce College
Chikhaldara

Field Director and Chief Conservator of Forests
MELGHAT TIGER RESERVE , AMRAVATI

MAHARASHTRA STATE
FOREST DEPARTMENT
OFFICE OF THE CONSERVATOR OF FORESTS & FIELD DIRECTOR,
TADOBA-ANDHARI TIGER RESERVE, CHANDRAPUR
Mul Road, Chandrapur 442401
Phone No. (07172) 251414
E-Mail ccffdtadoba2@mahaforest.gov.in

By Email
Desk no – 4/Steno/2022-23/ 549

Chandrapur, Date 30 /05/2022

Sir,

Subject :- Letter of appreciation

On behalf of Tadoba-Andhari Tiger Reserve, Chandrapur, I place on record our sincere appreciation towards Prof. G. D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Tadoba-Andhari Tiger Reserve. He has conducted field visits and conducted on field training and workshops involving Forest officials from the cadre of Forest Beat Guards to Field Director on the grassland management, Wild legume identification, grass seed collection and weed eradication on dated 07/05/2022 and 08/05/2022.

This has resulted in visible change in different grasslands spread over this Tiger Reserve and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

(Dr. Jitendra S. Ramgaokar, IFS)
Conservator of Forests & Field Director,
Tadoba-Andhari Tiger Reserve, Chandrapur

To,
The Principal,
Arts Science and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State-444 807

FOREST DEPARTMENT
GOVERNMENT OF TELANGANA

Sri C.P. VINODKUMAR,I.F.S.,
Chief Conservator of Forests &
Field Director Project Tiger,
Kawal Tiger Reserve, Nirmal.

Forest Complex
Nirmal – 504 106
Telangana
e-mail : fdptkawal@gmail.com

File No.4258/2017/D1 Dated: 26.5.2022

Sir,

On behalf of Kawal Tiger Reserve, Nirmal, I place on record our sincere appreciation towards Prof. G.D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Kawal Tiger Reserve, Nirmal. He has conducted field visits and conducted on field training and workshops involving Forest officials from to cadre of Forest Beat Officer to Field Director Project Tiger on the grassland management, Wild legume identification, grass seed collection and weed eradication. This has resulted in visible change in different grasslands spread over this Tiger Reserve and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

With Regards,

Yours Sincerely,

(C.P. Vinod Kumar, I.F.S.,) 26.5.22
Chief Conservator of Forests &
Field Director Project Tiger,
Kawal Tiger Reserve, Nirmal.

To:
The Principal,
Arts Science and Commerce College,
Chilkhaldara, Amaravati District,
Maharashtra State – 444 807

Ashok Kumar Mishra
Chief Conservator of Forests & Field Director

PENCH TIGER RESERVE
Seoni (M.P.) 480661
Ph.: (07692) : 223794
Fax : (07692) : 223204
M.: +91 9424794106
E-mail : fdpennp.sni@mp.gov.in
Website : www.penchtiger.co.in
@penchtrmp @penchmp

TO,

Prof. GD Muratkar
Head of the Department, Environment Science
Arts, Science and Commerce College, Chikaldhara
Amravati (Maharashtra)- 444807

Sub: **Appreciation of Services Rendered in Grassland Management in the Pench TR.**

This is with great pleasure that I acknowledge and immensely appreciate your technical guidance for the development of grasslands in the Pench Tiger Reserve. An eminent agrostologist of central India, you have been visiting Pench Tiger Reserve to share your experience of grassland management with officers' staff of the tiger reserve, and to train them in the recovery and improvement of this important habitat type upon which depends a huge population of ungulates of different species.

Your recent visits in to the protected area and interaction with Pench management have considerably added to our understanding of the management of grassland habitat. I hope that in future also you will lend us this tremendous support for the cause of wildlife conservation in the tiger reserve.

25-9-21

(Ashok Kumar Mishra)
I.F.S.
CCF & Field Director
Pench Tiger Reserve, Seoni

MAHARASHTRA STATE
FOREST DEPARTMENT
OFFICE OF THE CONSERVATOR OF FORESTS & FIELD DIRECTOR,
TADOBA-ANDHARI TIGER RESERVE, CHANDRAPUR
Mul Road, Chandrapur 442401
Phone No. (07172) 251414
E-Mail ccffdtadoba2@mahaforest.gov.in

Desk no - 4/Steno/2021-22/ 2200

Chandrapur, Date 20/12/2021

CERTIFICATE

TO WHOM IT MAY CONCERN

Professor G. D. Muratkar, (Head of the Department of Environmental Science, Arts, Science & Commerce College Chikhaldara, District- Amravati) has written a book *"Tadoba : Grasses species (Important)* "in academic year 2021-22.

This book has been published on 18/12/2021 by Shri. R. M. Ramanujam (IFS), Conservator of Forests & Field Director, Navegaon-Nagzira Tiger Reserve, in presence of Dr. Jitendra S. Ramgoakar (IFS), Conservator of Forests & Field Director, Tadoba-Andhari Tiger Reserve, Chandrapur.

This book is very important for frontline staff and officers of Tadoba-Andhari Tiger Reserve in identification of grasses and wildlife habitat management.

(Dr. Jitendra S. Ramgaokar, IFS)
Conservator of Forests & Field Director
Tadoba-Andhari Tiger Reserve, Chandrapur

P.V. RAJA RAO, IFS
Director /CCF &
Secretary, CEFNARM

Telangana State Forest Academy
Government of Telangana,
Dulapally, Hyderabad – 500 100
Land Line (O) : 040 – 29 70 48 96
Mob : + 91 94 40 81 01 66
e-mail : tsfa.hyd@gmail.com
peshi.tsfa@gmail.com

LETTER OF APPRECIATION

The Telangana State Forest Academy, sincerely appreciates Prof. Gajanan Dadaraoji Muratkar of Maharashtra for the vast & exhausting knowledge on Grasslands.

Prof. Muratkar delivered very information & exhaustive lecture on Zoom webinar as a part of online lectures to the Forest Range Officer trainees VIII Batch (batch comprises trainees of Uttar Pradesh, West Bengal & Karnataka) on 22nd February 2022.

It was a splendid presentation besides interaction with the Forest Range Officer trainees exposing them to various kinds of Grass species coupled with identification tips for identification in the field.

Your eloquent sharing on "Grassland Development and Management" was fully appreciated and the trainees got benefited from your views and vast experiences in the field of Grassland Management.

Looking forward to your cooperation for promotion and imparting further professional expertise in future as well.

with best regards

Yours sincerely

(SRI P. V. RAJA RAO, IFS)
Director/CCF

To
Prof. Gajanan Dadaraoji Muratkar
Head, The Botany and Environmental Science Department of the Arts,
Science and Commerce College at Chikhaldara, Maharashtra State

Ashok Kumar Mishra
Chief Conservator of Forests & Field Director

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Website : www.penchtiger.co.in
@penchtrmp @penchmp

TO,

Prof. GD Muratkar
Head of the Department, Environment Science
Arts, Science and Commerce College, Chikaldhara
Amravati (Maharashtra)- 444807

Sub: **Appreciation of Services Rendered in Grassland Management in the Pench TR.**

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Your recent visits in to the protected area and interaction with Pench management have considerably added to our understanding of the management of grassland habitat. I hope that in future also you will lend us this tremendous support for the cause of wildlife conservation in the tiger reserve.

25-9-21

(Ashok Kumar Mishra)
I.F.S.
CCF & Field Director
Pench Tiger Reserve, Seoni

MAHARASHTRA STATE
FOREST DEPARTMENT

OFFICE OF THE CONSERVATOR OF FORESTS & FIELD DIRECTOR,
TADOBA-ANDHARI TIGER RESERVE, CHANDRAPUR

Phone No. (07172) 251414
E-Mail ccffdtadoba2@mahaforest.gov.in
Mul Road, Chandrapur 442401

Desk no – 4/Steno/2021-22/ 1628

Chandrapur, Date 14/10/2021

To,

Prof. G. D. Muratkar,
Head of the Department, Environment Science
Arts, Science & commerce College, Chikahldhara
Amravati (Maharashtra)-44807

Subject :- Appreciation of Services Rendered in Grassland Management in the Tadoba-Andhari Tiger Reserve, Chandrapur.

This is with great pleasure that I acknowledge and immensely appreciate your technical guidance for the development of grasslands and control of invasive weeds in the Tadoba-Andhari Tiger Reserve. An eminent agrostologist of central India, you have been visiting Tadoba-Andhari Tiger Reserve to share your experience of grassland management with officers / staff of the tiger reserve, and to train them in the recovery and improvement of this important habitat type upon which depends a huge population of ungulates of different species.

Your many visits since September 2020 including the recent 3 days workshop on meadow management at Tadoba-Andhari Tiger Reserve and interaction with Tadoba-Andhari Tiger Reserve management have considerably added to our understanding of the management of grassland habitat. Your special efforts in documenting the works at different stages will help in long term evaluation of the efforts that are being taken under your guidance. I hope that in future also you will lend us this tremendous technical support for the cause of wildlife conservation in the tiger reserve.

(Dr. Jitendra S. Ramgaokar, IFS)
Conservator of Forests & Field Director
Tadoba-Andhari Tiger Reserve, Chandrapur


Latitude: 20.339477
Longitude: 79.310405
Elevation: 281.84±13 m
Accuracy: 9.2 m
Time: 07-05-2022 14:58


MAHARASHTRA FOREST DEPARTMENT
(Grassland Manogement)
Division : Dy. Director (Core), TATR
Range : Kolara Round : Kolara Beat : Navegaon Camp No. : 50
IN-SITU CONSERVATION PLOT - WILD LEGUMINOUS PLOT

डॉ. गजानन मुरतकर का एसएलटीपी संरक्षण हीरो पुरस्कार के लिए चयन

अमरावती| चिखलदरा के सिपना एजुकेशन सोसाइटी के कला, विज्ञान व वाणिज्य महाविद्यालय के प्रोफेसर डॉ. गजानन मुरतकर का एसएलटीपी कन्जर्वेशन पुरस्कार-2022 के लिए चयन हुआ है। विश्व पृथ्वी दिवस पर उक्त पुरस्कार की घोषणा की गई है। बता दे कि डॉ. गजानन मुरतकर चिखलदरा के कला, विज्ञान व वाणिज्य महाविद्यालय में एक वनस्पतिशास्त्र और विश्वविद्यालय के प्रोफेसर के रूप में कार्यरत है। उन्हें ग्रास मैन ऑफ इंडिया के नाम से भी जाना जाता है। एक घास का मैदान (चारागाह) विकास तकनीक का बीड़ा उठाया है। जिसमें उन्होंने स्थानीय घास की पहचान करने, बीज बैंक तैयार करने, मदर बेड बनाने और स्थानीय घास पेश करने के लिए क्षेत्र स्तर के वन कर्मचारियों को शामिल किया है। व्यवस्थित रूप से घास के मैदान बनाने के लिए इस तकनीक को उन्होंने 2012 में अमरावती जिले के मेलघाट टाइगर रिजर्व में भारत के सबसे पुराने बाघ अभयारण्यों में से एक में विकसित किया था।अमरावती जिले के मेलघाट टाइगर रिजर्व में तथा अन्य टाइगर रिजर्व में चारागाह संरक्षण हेतु प्रयास किए हैं।

दैनिक भास्कर Sat, 23 April 2022 https://epaper.bhaska

SUNDAY TIMES OF INDIA, NAGPUR
MAY 1, 2022

TIMES CIT

'GRASS IS ARCHITECT OF OUR FOREST ECOSYSTEM'

Vijay.Pinjarkar@timesgroup.com

Gajanan D Muratkar (53), a botanist and professor with Sipna Education Society's Arts, Science, and Commerce College at Chikhaldara (Amravati), has been selected for the Satpuda Landscape Tiger Partnership (SLTP) Conservation Hero Award-2022 for his invaluable grassland conservation efforts in the Central Indian landscape. The award was announced on World Earth Day. Known as the 'Grass Man of India', he has pioneered a meadow development technique in which field staff are involved to identify the local grasses. In 2012, this technique was developed by him in Melghat, the country's oldest tiger reserve. Muratkar is also a recipient of the Sanctuary Green Teacher Award-2013. TOI talked to him about his feats.

EXCERPTS FROM AN INTERVIEW...

Q. What inspired you to specialise in meadow development?

A. As I'm working as a professor in environmental and life sciences, I always focused on the field and result-oriented research in Melghat Tiger Reserve (MTR). I started the ecological and environmental study of grasses in MTR. During the same period, I was invited by the forest secretary Pravin Pardeshi, Satpuda Foundation's Kishor Rithe, and eminent botanist CR Babu for a workshop on the eradication of invasive species. This was the turning point as ex-field director KP Singh invited me to restore wildlife habitats by removing invasive species.

Q. Tell us about your success stories from the field?

A. In 2012, the forest department rehabilitated 9 villages from the core area of MTR. Post rehabilitation of Churni, Vairat, Dhargad, Amona, Gullarghat, Somthana, Kelpani, Nagartas, and Barukheda the cultivated lands were full of invasive species like Lantana Camara, wild tulsi, and other invasive plant species. We developed grass nurseries (seed plots) right in the midst of meadows and also carried out important grasslands management interventions like studying soil parameters, identification of grasses, weeds, wild leguminous plants, collecting grasses seeds, drying, storing, and enriching in May-June by selecting sites.

Q. How do you double up as a professor and a grass man in the field?

A. As I am an academician, my primary duty is to carry out teaching, learning, evaluation, and research work at my institute, but grasslands or meadow development work is my passion. I spend my Diwali and summer vacations, and weekly holidays conducting field visits, workshops, and training for the field staff on meadow development and management.

Q. Grasses are common but why are these ecologically important?

A. Grasses are the monocot plants with more adoptive characteristics – morphological, ecological, and anatomical adaptations. The grasses are ecologically important because they develop root systems to control soil erosion, and maintain and conserve soil moisture and soil microclimate. Grasses also check run-off and maintain herbivore and carnivore habitats, besides bird nesting habitats.

Q. Not much is talked about research on grasses in India.

A. Yes, it's true, but now research is happening. Research on grass requires taxonomical specialization in the identification, classification, and phytochemical analysis and phenology of grasses.

Where was your model implemented is the country?

In the past 10 years, my technique to eradicate weeds and create such meadows has been implemented in tiger reserves and protected areas of Maharashtra, Madhya Pradesh, Rajasthan, Karnataka, Andhra Pradesh, Telangana, Chattisgarh, Jharkhand, Tamil Nadu, Uttarakhand, and Kerala. I also started a meadow development programme in Kuno National Park, MP. The lack of scientific meadow management activities has caused the degradation of forests. Several meadow development workshops were organized in the states producing good results. In Kuno, the frontline staff converted a 2 hectare patch into a 360-hectare grass meadow at another rehabilitated site. This has helped bring cheetah to Kuno. Besides, Sawai Madhopur, Bharatpur, Jim Corbett, and Mukundara Hills tiger reserves are also anxious for my support. Satpuda Tiger Reserve, MP, too achieved huge success through scientific strategies under my guidance in the last decade. This also helped MP successfully introduce swamp deers in Bori in Satpura. Changes in Kawal Tiger Reserve (Telangana) are working wonders. For the last 3 years, I started grass meadow management interventions in Palasgaon in Tadoba. The enrichment of palatable grasses and wild legume seeds in the meadow resulted in the development of soft fodder grasses and this recorded the movement of nearly 2,000 spotted deer. These are some examples.

SUNDAY INTERVIEW
Gajanan D Muratkar

Grasses grown in the forest are wild with good resistance power and adaptations. Wild grasses are adaptive with good flowering, fruiting and dispersal rate

Q. How and what should be done to conserve grasses?

A. I suggest a five-pronged strategy for the conservation of grasses. It includes identification during flowering and fruiting season, identification of native and invasive grasses, in-situ conservation of grasses by preparing the calendar for grass seed collection, development of grass seeds plot as per the soil suitability, and lastly protection of such meadows from fires.

Q. What is the present status of grasslands in Central India?

A. Grasslands occupy nearly 24% of the geographical area in India. Grasslands of India have been classified into five broad cover types. With the advancement of ecological studies on grassland vegetation, grasslands are highly dynamic ecosystems.

Q. What is the role of grasses in wildlife conservation?

A. Grasses are of two types — soft and coarse. Soft grasses are useful for herbivores that prefer soft feeders and coarse grasses are useful for other coarse feeder herbivores. Grasslands are of three types — smaller, intermediate, and taller. Each grassland has ecological significance. Smaller grasslands are used by wild animals like spotted deer, blackbucks and chinkara. Intermediate grasslands are used by large herbivores and taller grasslands are preferred for hiding, resting, and breeding by wild animals. Wildlife and grasslands are directly associated with each other and hence grasses are the engineers and architects of our forest ecosystem.

Q. What is the difference between the grasses grown on lawns and forests?

A. Grasses grown in the forest are wild with good resistance power and adaptations. Wild grasses are adaptive with good flowering, fruiting, and dispersal rate. Lawn grasses are ephemeral and hybridized. Lawn grasses are rhizomatous while wild grasses are non-cultivated and non-hybridized.

Full interview on www.toi.in

m.timesofindia.com/city/nag

TOI

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'Grass is engineer and architect of our forest ecosystem'

CITY / Vijay Pinjarkar / May 1, 2022, 04:38 IST

Gajanan D Muratkar (53), a botanist and professor with Sipna Education Society's Arts, Science, and Commerce College at Chikhaldara (Amravati), has been selected

Grassland management training begins

STATE BUREAU
Kumram Bheem Asifabad

A week-long grassland management training began in Kaghaznagar Forest division on Monday. Renowned grasslands expert Dr GD Muratkar of Maharashtra is training forest officials in raising the grasslands and thus to protect herbivores that give rise to population of tigers.

Renowned grasslands expert Dr Muratkar of Maharashtra is training forest officials in raising the grasslands

Dr Muratkar explains tips to manage grasslands to forest officials in Kaghaznagar Forest division on Monday

During the event, Muratkar explained insights and techniques to improve existing grassland habitat by enriching them with grass seeds. He trained the foresters in creating grasslands in solar-powered percolation tanks.

He visited compartment number 246 in Bejjur Forest block under the Kaghaznagar division. He opined that Kaghaznagar Forest Division, being the gateway of Telangana for tigers inhabiting in Tadoba-Andheri Tiger Reserve of Maharashtra, had the rich scope to become an important tiger habitat. He is scheduled to conduct a training session on the grassland management slated to be held in Jannaram forest division on Tuesday.

Field Director to Project Tiger, Kawal Tiger Reserve, and Conservator of Forests CP Vinod Kumar and District Forest Officials of Kumram Bheem Asifabad, Mancherial, Nirmal and Adilabad district, L Ranjith Naik, Shivani Dongre, Prasad, Dr B Prabhakar, respectively, took part in the event. Kaghaznagar Forest Divisional Officer Rajaramana Reddy also present.

लोकमत

मेळघाटच्या 'ग्रास मॅन' ने १२ राज्यातील ३० व्याघ्र प्रकल्पात फुलविले कुरण

आंतरराष्ट्रीय व्याघ्र दिन : 'गवत असेल तरच वाघ वाचेल'ची संकल्पना

स्पेशल रिपोर्ट

नरेंद्र जावरे
लोकमत न्यूज नेटवर्क

चिखलदरा (अमरावती) : जंगल असेल तर वाघ दिसेल, वाघासाठी आवश्यक असलेले तृणभक्षी प्राणी आणि त्या प्राण्यांसाठी अति आवश्यक असलेले गवती कुरण अशा या अन्नसाखळीला तयार करण्यासाठी चिखलदरा येथील एका महाविद्यालयाच्या प्राध्यापकाने एक दोन नव्हे, तब्बल देशातील १२ राज्यातील ३० पेक्षा अधिक व्याघ्र प्रकल्पात तृणभक्षी प्राण्यांसाठी कुरणक्षेत्र तयार केले आहे. त्यामुळे पर्यावरणासह व्याघ्र संवर्धनात मोठी मदत झाली आहे.

चिखलदरा येथील कला, वाणिज्य महाविद्यालयात पर्यावरणशास्त्राचे विभागप्रमुख प्रा. गजानन मुरतकर असे या प्राध्यापकाचे नाव आहे. गवती कुरणामुळे जमिनीची धूप, तापमान थांबण्यासह पाण्याचा निचरा, कीटक, सरपटणाऱ्या प्राण्यांना नैसर्गिकरीत्या आश्रयस्थान, तृणभक्षी प्राण्यांना आवडते खाद्य व वाघ, बिबट्यासारख्या मांसभक्षी प्राण्यांना जंगलातच शिकार मिळत असल्याने शहरात जाऊन मानव-वन्यजीव संघर्ष थांबण्यास मदत झाली आहे.

व्याघ्र प्रकल्पात झालेले कार्य दाखविताना प्रा. गजानन मुरतकर.

तृणभक्षी प्राण्यांत गवताच्या आवडीनिवडी

- मानवांमध्ये जेवणाच्या आवडीनिवडी आहेत त्याचप्रमाणे चितळ, गवा, सांबर, अशा विविध तृणभक्षी प्राण्यांच्या आवडीनिवडी आहेत, काहींना मुलायम व कडक गवत आवडते. त्यानुसार चितळ मार्दल गवत हे रसगुल्लाप्रमाणे आवडते, तर गवा कुसळी व गोधळी, सांबर गवत कमी व झाडांची पाने, फुले, फळे जास्त खातो, तृणभक्षी प्राण्यासाठी दुर्वा, पवन्या, रानतूर, रानमूगा, रानसोयावीन, बांबू, अशा विविध प्रजातींचे गवत आहे.

या राज्यात गवती कुरण

- मध्यप्रदेश : कान्हा, सातपुडा, पन्ना, पेंच, बांधवगड.
- महाराष्ट्र : मेळघाट, सह्याद्री, पेंच, ताडोबा, नवेगाव, टिपेश्वर, नानज, भीमाशंकर, रहेकुरी.
- छत्तीसगड : अंचानकमार व इतर ४ अभयारण्यात.
- राजस्थान : रणथंबोर, मुकुंद-राहिल्स.
- कर्नाटक : बंदीपूर नागरहोले काली भद्रा बीआरटी.
- तामिळनाडू : के एम टी आर.
- ओडिशा : सिमलीपाल सातखोशिया.
- तेलंगणा : कवल अमराबाद.
- बिहार : वाल्मीकी टायगर रिझर्व्ह.

एकंदर मुंगी ते हत्तीपर्यंत गवत [illegible] अन्नसाखळीचा दुवा ठरले आहे. मेळघाट व्याघ्र प्रकल्पात इतर व्याघ्र प्रकल्पांपेक्षा ११६ पेक्षा अधिक गवताच्या प्रजाती आहेत. [illegible] तृणभक्षी प्राणी कमी वजनाचा असल्याचे निष्कर्ष पुढे आल्याचे मुरतकर यांनी सांगितले.

Nagpur Main
Page No. 2 Jul 29, 2021
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Habitat Management

Grasslands in Tadoba

Grasslands are critical to the health of any ecosystem as they provide the necessary grazing, resting, hiding, and breeding ground for all kinds of predator and prey species dwelling in an area. They are typically the area in which the vegetation is dominated by continuous cover of grasses and some herbs, shrubs, and wild leguminous plants. The roots of the grass and the plants maintain the soil water / moisture and prevent it from evaporation during the summer season thus helping conserve the quality of the soil.

Grasslands in Central India are of taller and intermediate type, but the annual form of grasslands are adapted for different climatic conditions. Total 24% of the geographical area of India is covered with grasslands which are decreasing at a fast pace due to the invasion of woody species and weeds. Grasslands are heterogeneous in composition. Grasslands are mainly found in Gujrat , Maharashtra , Madhya Pradesh , and Uttar Pradesh. Banni grassland from Kutch, Gujarat is the largest grassland in India.

Incidentally there are no natural pastures within Tadoba-Andhari Tiger Reserve area. However after the rehabilitation of villages like Navegaon, Jamni, Pandharpauni, and Palasgaon new grasslands are being developed and managed in a scientific manner. The roadside grasslands and internal grassland patches play vital role in interconnection of grasslands of TATR. Around 885 hectares of grassland amounts to 7-9 % of the total Tadoba landscape.

All three types of grass varieties – smaller, intermediate, and taller –can be found here. The most noteworthy among them is Vetiver grass (scientific name - VitiveriaZizanioides), also called Khus and is found in Vidarbha region of Maharashtra. This grass is native of India and tropical Asia. Predators like tigers and leopards have been observed to use the four to give feet Khus grass clumps to make ambush attacks on deer or wild boars around Tadoba, Telia and Jamnilake. Another predominant local grass variety is Cynodondactylon, commonly known as Harali grass. It's a perennial, palatable grass used by spotted deer in grazing habitat.

The rich diversity in the TATR also offers almost 6 to 7 different wild leguminous plants in the grasslands here. Hyptissaveolens (Bhutganjya) is a dominant weed in grassland. Amphiterrestrial grasses are distributed in the water bodies in the grasslands. The most challenging work is removal of Zadugawat and its restoration.

Management of these grasslands is a challenging process. Weeds and other unwanted woody species have to be identified in time for removal and have to be uprooted before fruiting, Ecological restoration processes have to be undertaken in the prescribed scientific way, and the grassland has to be enriched / restored by selected and suitable grasses. It is a process which goes on throughout the year.

The frontline staff in each range of TATR are trained for grasslands management. They prepare maps of each

.... continue on page 11

डॉ. गजानन मुरतकर यांना कन्झर्व्हेशन हिरो पुरस्कार

म.टा. प्रतिनिधी, नागपूर

चिखलदरा येथील वनस्पतिशास्त्रज्ञ आणि गवताळ भूभाग या विषयातील तज्ज्ञ डॉ. गजानन मुरतकर यांना कन्झर्व्हेशन हिरो पुरस्कार जाहीर झाला आहे. सातपुडा लॅण्डस्केप टायगर पार्टनरशिपच्यावतीने २०२२ सालासाठी या पुरस्काराची घोषणा करण्यात आली. मध्य भारतातील गवताळ प्रदेशांच्या संवर्धनासाठी त्यांना हा पुरस्कार देण्यात आला. २५ हजार रुपये रोख आणि प्रमाणपत्र असे पुरस्काराचे स्वरूप आहे. डॉ. मुरतकर हे सिपना शिक्षणसंस्थेच्या चिखलदरा येथील कला, विज्ञान आणि वाणिज्य महाविद्यालयात कार्यरत आहेत. ते भारताचे गवतपुरुष म्हणून ओळखले जातात. त्यांनी गवताळ प्रदेश विकासाची तंत्रे शोधून काढली आहेत. या विषयात त्यांनी वनविभागाच्या कर्मचाऱ्यांनाही प्रशिक्षण दिले आहे. स्थानिक गवत ओळखणे, तिची योग्य लागवड करणे, बीजबँक तयार करणे याबाबतची तंत्रे त्यांनी मेळघाट व्याघ्रप्रकल्पातील प्रयोगांमधून शोधून काढली आहेत. ती त्यांनी देशभरातील दहा राज्यांमधील संरक्षित वनक्षेत्रांमध्ये राबविली आहेत.

लोकमत

विशेष

आज आंतरराष्ट्रीय जैवविविधता दिन

मेळघाट व्याघ्र प्रकल्पात कुरणांची विविधता

भारतातील ग्रासमॅन डॉ. गजानन मुरतकर यांचे संशोधन, मध्य भारतातील एकमेव टायगर रिझर्व्ह

मेळघाटात १९ गवती कुरणे

आमोणा, बारुखेडा, चुर्णी, धारगड, सोमठाणा, कुंड, कोह, बोरी, गुल्लरघाट, पिली, अंबाबारवा, नागरतास, ढाकावी, कैलपाणी, नरनाळा, सोनाळा १ व २, गोलाई, वैराट अशा १९ गवती प्रजातींची कुरणे पाहणी अभ्यासात आढळल्याचे गजानन मुरतकर यांनी सांगितले.

कुरणांचे हे फायदे

वन्यजीव अधिवास व्यवस्थापन गवतामुळे चांगल्याप्रकारे होते. प्रजनन आणि हिंस्र प्राण्यांची शिकार होण्यापासून वाचण्यास मदत करतात. अन्नसाखळीला पूरक आहे. गवतामुळे मातीची धूप कमी होते व मातीमध्ये पाणी राखण्यास मदत होते.

कुरणांची ही वैशिष्ट्ये

अकोट वन्यजीव विभागामध्ये सर्वाधिक जंगली तूर, रानमूग, रानउडीद, रान बरबटी, जंगली सोयाबीन अधिक प्रमाणामध्ये आढळतात. सर्वाधिक गवत प्रजाती येथे आहेत. सिपना वन्यजीव विभागामध्ये रंगुबेली, रायपूर, सेमाडोह भागामध्ये विल्डलेग्युमिनोस वनस्पतीची विविधता मोठ्या प्रमाणात आहे. रानफळे वनस्पतीची विविधता प्रत्येक ऋतूमध्ये आढळून येते.

जंगलातील अन्नसाखळी सुरळीत चालण्यासाठी आवश्यक असलेले घटक मेळघाटात तर आहेतच, परंतु गवताच्या प्रजाती मोठ्या प्रमाणात आढळून येतात.

- डॉ. गजानन मुरतकर, जैवविविधतेचे कुरण अभ्यासक, चिखलदरा

वनपर्यटन

नरेंद्र जावरे

मेळघाट व्याघ्र प्रकल्प हा मध्य भारतातील एकमेव टायगर रिझर्व्ह आहे, ज्यामध्ये गुगामल, अकोट, सिपना, अंबाबारवा वन्यजीव विभागातील २० पेक्षा जास्त गावांचे पुनर्वसन १९९४ ते २०२२ पर्यंत झाले आहे. भौगोलिकदृष्ट्या मेळघाट व्याघ्र प्रकल्प विविधतेने नटलेला आहे. प्रमुख नद्यांचा उगम मेळघाटातून झालेला आहे. पर्यावरणीय विविधता या ठिकाणी आढळून येते. माती, झाडे, फुले, बांबू, फर्न, गवत एवढेच नव्हे तर पिके व सांस्कृतिक विविधता मेळघाटमध्ये दृष्टीस पडते, अशी माहिती भारताचे ग्रासमॅन म्हणून विख्यात डॉ. गजानन मुरतकर यांनी आंतरराष्ट्रीय जैवविविधता दिनानिमित्त 'लोकमत'शी बोलताना दिली. मेळघाट व्याघ्र प्रकल्प अकोट वन्य जीव विभाग, गुगामल वन्यजीव विभाग, सिपना वन्यजीव विभाग असा तीन भागांमध्ये विस्तारित आहे. मेळघाटमध्ये १२६ पेक्षा जास्त गवताच्या प्रजाती आढळतात. काही प्रजाती कुरणमध्ये, नदीकाठाने, रस्त्याच्या दुतर्फा झाडाच्या सावलीमध्ये आढळतात. ज्या गवत प्रजाती सावलीमध्ये वाढतात, त्यांना सावलीप्रिय गवत प्रजाती असे संबोधले जाते. ज्या गवत प्रजाती प्रत्यक्ष उन्हात वाढतात, त्यांना ऊनप्रिय गवत असे संबोधले जाते. वार्षिक-बहुवार्षिक, खाद्य-अखाद्य तसेच मुलायम- कणखर असलेल्या गवत प्रजाती आहेत. हरीण, चिकारा, भेकर, सांबर हे मुलायम, तर इंडियन गौर, नीलगाई या कणखर गवत खातात.

Hello Amravati
Page No. 4 May 22, 2022
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FOREST DEPARTMENT
GOVERNMENT OF TELANGANA

Sri C.P. VINODKUMAR.I.F.S.,
Chief Conservator of Forests &
Field Director Project Tiger,
Kawal Tiger Reserve, Nirmal.

Forest Complex
Nirmal – 504 106
Telangana
e-mail : fdptkawal@gmail.com

File No.4258/2017/D1 Dated: 26.5.2022

Sir,

On behalf of Kawal Tiger Reserve, Nirmal, I place on record our sincere appreciation towards Prof. G.D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Kawal Tiger Reserve, Nirmal. He has conducted field visits and conducted on field training and workshops involving Forest officials from to cadre of Forest Beat Officer to Field Director Project Tiger on the grassland management, Wild legume identification, grass seed collection and weed eradication. This has resulted in visible change in different grasslands spread over this Tiger Reserve and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

With Regards,

Yours Sincerely,

(C.P. Vinod Kumar, I.F.S.,) 26.5.22
Chief Conservator of Forests &
Field Director Project Tiger,
Kawal Tiger Reserve, Nirmal.

To:
The Principal,
Arts Science and Commerce College,
Chilkhaldara, Amaravati District,
Maharashtra State – 444 807

Government of Maharashtra
Forest Department

Office of Conservator of Forests & Field Director, Tadoba Andhari Tiger Reserve, Chandrapur

Tel No. (07172) 251414, 277116 Mul Road, Chandrapur-442401
E-mail- ccftadtadoba2@mahaforest.gov.in/ ccf_fdtatr@rediffmail.com

No: Desk-4/Steno/2021-22 2612 Chandrapur Dt. 31/1/2022

To,

Dr. G.D. Muratkar
Head,
Department of Enviromental Sciences
Art, Science & Commerce College.
Chikhaldara.

Subject :- Conducting ecological study of grasses of Tadoba Andhari Tiger Reserve Regarding.

Reference :- Deputy Director (Core), TATR Letter No. 984/2021-22 dated 31/01/2022.

Respected Sir,

As you are aware we at Tadboa Andhari Tiger Reserve Chandrapur, are working extensively to make Tadoba Tiger Reserve free from invasive weeds and also to restore degraded grasslands by promoting native species of grasses. We have received valuable guidance from you from time to time to carry out this important work by following sound scientific practices. We are also working on developing degraded areas vacated by villages that have been relocated outside the park. We want to document this work and also conduct study on the grass species available in Tadboa Andhari Tiger Reserve and its ecological aspects.

Considering your technical expertise in the field of grasses and your continuos guidance to field staff and officers of Tadboa Andhari Tiger Reserve, we would like to request you to take up a separate study on ecology of grasses in Tadboa Andhari Tiger Reserve Chandrapur.

This will help the management take informed habitat management decisions in future and restore all degraded areas of the park and outside to their full ecological potential as habitat for wildlife.

(Dr. Jitendra Ramgaokar)
Conservator of Forests & Field Director,
Tadoba Andhari Tiger Reserve,
Chandrapur

Copy to : Deputy Director (Core), TATR Chandrapur for information with regards to letter under reference.

Department of Environmental Science

Arts ,Science and Commerce College Chikhaldara

Extension Activity

Title of activity : Training to the frontline staff for grassland Management in Protected Areas

Feedback form

Academic Year 2021-22

Name of frontline staff / officer:...स. पी. पोटे वनरक्षक.......................

Designation :......वनरक्षक..

Name of Tiger Reserve : Melghat Tiger Reserve (Akot Wildlife Division)

Date of visit : 14 /11 / 2021

Grassland management training to frontline staff by – Prof. G D. Muratkar ,(Grasses Expert)

Head Department of Environmental Science and his team.

Objectives : 1) Grasslands observations 2) Habitat improvements training **3) Grasses , weeds , wild legumes identification 4) Grasses seeds collection 5) Enrichment of grasslands by palatable grasses seeds.6)** Brush woods management 6) Ecological Restoration practices.

Feedback :

आज दि. 14/11/2021 रोजी धारगड परिक्षेत्रात गवत प्रजाती ओळख व गवत बी गोळा करणे कार्यशाळा घेण्यात आली. यामध्ये कोणकोणत्या खाद्य गवत प्रजाती, अखाद्य गवत प्रजाती, बी गोळा करणे, माती ची ओळख व त्यामध्ये येणाऱ्या प्रजाती इत्यादी माहिती तसेच बी गोळा करण्याचा कालावधी इत्यादीची माहिती प्रत्यक्ष कुरण विकास क्षेत्रात जाऊन चर्चेतून [illegible] समजावून सांगण्यात आली.

सदर माहितीचा उपयोग अखाद्य गवत प्रजातीचे निर्मूलन करून खाद्य प्रजातीचे गवत लागवड करण्यासाठी, खाद्य गवत बी गोळा करून उत्तम तृणभक्षी प्राण्यासाठी अधिवास निर्मितीसाठी होईल!

धन्यवाद!!!

Date : 14/11/2021.

Signature

स. पि. पोटे वनरक्षक

आंबडा बीट

Pench Tiger Reserve Sioni (M.P.)
Workshop on Grassland Management

Date:- 01.11.2021

Resource Person:- Prof. G. D. Murathkar
Head, Dept. of Env. Sci.

Game Range - Gumtara

Objectives:- ① Grasslands observation
② Grasses, weeds identification.
③ Wild legumes id.
④ Grasses seeds collection
⑤ Enrichment of grasslands
⑥ Habitat (wildlife) management

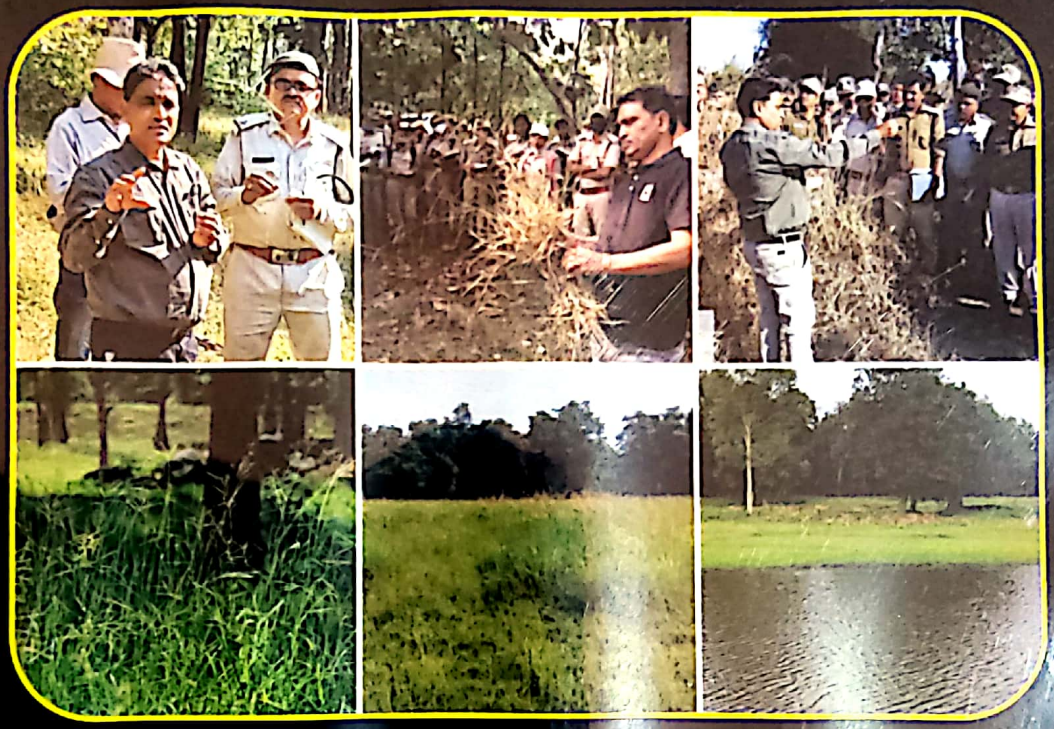
Feed back / Remarks:-

आज दिनांक 01/11/2021 को गेम रेंज गुमतरा अंतर्गत घास मैदानों का रखरखाव एवं सुधार कार्य विषय पर कार्यशाला का आयोजन सुनार बरी घास मैदान, काँस बरी घास मैदान एवं छोड़िया घास मैदान पर किया गया जिसमें क्षेत्रीय अमले को विभिन्न घास प्रजातियों की पहचान, घास बीज संग्रहण का समय, वशावुड उन्मूलन, खरपतवार उन्मूलन आदि से संबंधित जानकारी विस्तृत रूप में डॉ. जी.डी. मुराठकर द्वारा प्रदान की गई, जो घास मैदानों के सुधार कार्य हेतु अत्यंत उपयोगी सिद्ध होगी।

[signature] 1/11/2021
सहायक वन संरक्षक
छिन्दवाड़ा सेन

Extension Activity Report

"Training to the Frontline staff of Forest Department for Grasslands Management in Protected Areas"



Training by

Prof. G. D. Muratkar
Assist. Prof. & Head Dept. of Environmental Science
Arts, Science & Commerce College, Chikhaldara
Dist. Amravati - 444 807 M.S.

Duration of Activity
2020 - 2021

Department of Environmental Science
Arts, Science & Commerce College, Chikhaldara
Dist. Amravati - 444 807 M.S.

Extension Activity

Report on

Training to the frontline forest staff for grasslands Management in Protected Areas of India

By

Department of Environmental Science

Academic Year 2020-21

Title

Training to the frontline forest staff for grasslands Management in Protected Areas of India (Kawal Tiger Reserve, Tadoba Andhari Tiger Reserve, Bandipur Tiger Reserve, Panna Tiger Reserve, Satpuda, Kanha Tiger Reserve MP).

Goal

To develop grazing habitat for herbivores in Protected Areas specially in Tiger Reserve, Sanctuary and National park.

Participants in the field workshop

Sr. No.	Name of Protected Area	Duration	Beneficiaries	Beneficiary Number
1	Kawal Tiger Reserve Telangana State	27 – 30 August 2020	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	50
2	Sahyandri Tiger Reserve MS	November 2020	DCF, Field Director, RFO,	25

			Section officer, Bit guard of tiger reserve	
3	Tadoba Andhari Tiger Reserve MS	August 2020	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	25
4	Satpuda Tiger Reserve MP	10 – 11 August 2020	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	30
5	Bandipur Tiger Reserve Karnataka	26 November	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	25
6	Kanha Tiger Reserve MP	July 2020	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	50
7	Panna Tiger Reserve MP	February 21	DCF, Field Director, RFO, Section officer,	20

			Bit guard of tiger reserve	
8	Amrabad Tiger Reserve Telangana State	27 , 28 January 21	DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve	25

Concept

To know the soil characters, profile for grassland development in naturalpastures, degraded areas of forest and lantana removed areas for restoration ofgrasslands. To manage the grazing, browsing, breeding, nesting habitats.

To train the frontline staff for

- Grasses, weeds and wild leguminous plants identification from forest areas.
- Enrichment of grasslands
- Eradication of weeds from grasses for habitat improvement
- Brushwood management
- Geo mapping of grasslands
- Restoration of grasslands
- Grasses seeds collection, storage and enrichment.

The Context

The Protected Areas includes Tiger Reserves, National Parks, WildlifeSanctuaries, the wildlife like Herbivores, Omnivores, Carnivores habited in theprotected areas. The grasses are the producers, soil binders, provides chemical energyto the wildlife in the form of fodder species. The

protected areas forest are with 2-4.5% grasses naturally it should be 6.5 %-7.9%. Now recently natural grasslands andrelocated areas of the Protected Areas are developing in to good grasslands for theherbivores.Grasslands are the green ground cover of protected areas in forest. The grassesare useful for grazing habitat of wildlife (Herbivores). The threats to the grasslandsare soil degradation, loss of soil moisture, leach out of nutrients of the soil, forestsfires, weed infestation, woody species encroachment, and change in grasslands Composition, exotic species and decrease in nutritive value of the fodder grasses.The faculty member of the department of the college has the good expertise inthe grasses, weeds and forests flora identification and their nutritive values.

The grassland management practices includes

1. To give the field training to the forests field staff in the natural grasslands andrelocated areas of the Protected Areas in each season of the year.
2. To know the exact area of grassland year wise by demarcation of grasslandarea by GPS.
3. Grasses identification training to field staff by local names and scientificnames.
4. Weeds identification with local names and their flowering season.
5. Browsing species identification with local names.
6. Field training to collect the grasses seeds and wild legumes seeds.
7. Weed eradication programme two times in a year
8. Grasslands enrichment by seed broadcasting in May - June season.
9. Grasses biomass management practices in mosaic pattern.
10. Wild fruit trees identification and addition in relocated areas.
11. Complete training programmes are organized by the CCF & Field Director ofthe respective Tiger Reserves in each season.

The practices in the field

The detailed reports of field workshops for frontline staff are attached in the extension activity report with Text, Images and Appreciation letters.

Results of Extension activity

- Capacity building of frontline staff of Protected Areas.
- Field interventions for habitat improvement in P. A.
- E Herbarium of grasses and identification
- Documentation of bench marks and results
- Comparative analysis before and after work

Prof. G. D. Muratkar

Head Department of Environmental Science

Asst. Professor & H.O.D.
Dept. of Environmental Science
Arts,Science & Commerce College,
Chikhaldara

Arts,Science & Commerce College Chikhaldara

Acting Principal
Art,Science & Commerce College,
Chikhaldara,Dist.Amravati

Tadoba Andhari Tiger Reserve (M. S.)

Grasslands Management Observations & Recommendation's Report

Date of visit

01st to 03rd September 2020

Grassland Management observations in Tadoba Andhari Tiger Reserve

Grasslands of Tadoba Andhari Tiger Reserve are of heterogeneous type with three types of grasslands : Smaller , intermediate and taller grasslands with 70% palatable and 30% non palatable grasses. The grasslands possesses25% perennial palatable grasses and 45% annual fodder grasses with browsing species. The grasslands also comprises few wild leguminous plants. Most of the grasslands invaded by the weeds like Bhutganjya(Hyptis), Tarota (Cassia tora), Congress grass (Parthenium), Sidacordata , Sidaacuta , Corchorusetc weeds.Each grassland is with water body.The management practices conducted by the field staff in last two months are……

Moharli ,Palasgaon , Nawegaon, Pandharpauni, Jamni, Khatoda, Botezari , karwa range (TATR) all Grassland area :

Observations

- Weeds invasion along roadside area and inside the grasslands on large scale.
- Seeds of *Setariapumilla* (Wild Bajara) developed in each grassland
- Weeds like Bhutgangya (Hyptissaveolens) dominant in each grassland.
- Ageratum conyzoides weed common in grasslands
- PalasghaonGrassland : 85 Hect.

- Palasgaon village rehabilitated in 2019, mostly all were paddy fields before rehabilitation, soil fertile, grasses taller, intermediate, Iselimalaxum, Digitariaabludens, Setariapumilla, Paspaladium, Themeda, Heteropogon grasses are distributed in complete grassland, weeds invasion in more % in gaothan and other area of Palasgaon. Wild Leguminous plant Wild Tur (Atylosia or Cajanus) is dominant. Bhutganjya, Sida weeds common in grassland
- Navegaon Grassland : 274 Hect area

1. Largest grassland of TATR with 274 hect area.
2. Taller , intermediate grassland
3. Grassland invaded by ranbhendi , weeds like Bhutganjya, Sida , Cassia toraetc
4. Weeds invasion in boundaries of grasslands
5. Grasses : Themeda, Heteropogon, Dicanthium, Iselima, Ischemum, Cynodon, Digitaria, Elusine, Chloris, Setariaetc
6. Wild legumes : Ran Tur , Ran moog, Ran Barbati
7. Wild fruit trees like Bor
8. Brush woods invasion of Acacia
9. Roadside grasses with more weeds
10. Wild tur dominant in grassland
11. Dominant grasses are Themeda, Iselima, Heteropogon

Recommendation's

- Weeds uprooting two times per year – July , September, before flowering , fruiting weeds to be uprooted
- Brush woods management to reduce woody species but conserve fruit trees
- Uprooting of Bhendi plants from grasslands.
- Prepare inspection path of standard size in each grassland
- To prepare grasses, wild legumes seed plot with demarcation.
- Management of resting habitat
- Uprooting of Beshram plants
- After uprooting of unwanted non fodder weeds – Ecological Restoration by gawatpendi with grasses seeds.

Restoration after removal of weeds by fodder grasses seeds

- In next 20 days grass seeds collection is necessary.
- Grasses selection for seed collection are Dicanthiumannulatum, D. caricosum, D. tuberosum, Themedaquadrivalvis, Iselima, Setaria.
- Collection of wild leguminous seeds from 2nd December to 28th December.

Jamni Grassland : 47Hect

Observations

1. Smaller grassland suitable for spotted deers, black bucks
2. Grasses distribution: Cynodon, Dicanthium, Setariapumilla, Dicanthiumannulatum, Iselimaprostratum . I. laxum, Chloris virgate, C. barbata, Elusineindica, Setaria italic , etc

3. Weeds : Prtheniumhysterophorus (GajarGawat) dominant weed, Sida, Hyptis, Cassia tora
4. Ornamental plants sadafuli
5. Wild fruit trees present.
6. Water body present.

Recommendation's

- Weeds uprooting two times per year – July , September, before flowering , fruiting weeds to be uprooted
- Brush woods management to reduce woody species but conserve fruit trees
- Uprooting of ornamental plants from grasslands.
- Prepare inspection path of standard size in each grassland
- To maintain pressure the grasses of Jamni grasses – relief enclosure of 2 hectares size to be prepared, number two in jamni.

KosenkarGrassland : 10Hect

Observations

1. Oldest grassland with smaller and taller grasses.
2. Most of the grasses are palatable,
3. Wild fruit trees present
4. Brushwood infestation on large %
5. Grasses utility index good more than 70%.

Recommendation's

1. Uproot weeds along roadside before fruiting. Weeds like Butganjya, Sida, Cassia tora.
2. Brushwood Management to reduce woody species.

Weeds uprooting along roadside before Fruiting

Khatoda Grassland : 10 Hect.- Comp. No. 123

Recommondations

1. Weeds uprooting two times per year
2. Brushwood management

One of the best grassland of TATR, Conserve old grasslands from woody plant species and invasive weeds.

Roadside Grassland towards Botezariroad : 11 Hect.

Observations

1. Roadside taller grassland with dominant grasses like Themeda, Heteropogon, Dicanthium , Setaria
2. Grassland invaded by exotics like Stylosantheshammata.
3. Wild legumes in good %
4. Brushwood invasion in grassland.

Recommendation's

1. Weeds uprooting two times per year.

2. Uprooting of exotic species – Stylo
3. Brushwood management
4. Conserve wild leguminous plants.

Botezari Grassland : 37 Hect.

Observations

- Larger grassland with smaller and taller grasses like Saccharumspontanium(PadyalGawat)
- Grasses : DurwaGawat , Dicanthium , Iselima , Ran bajara, Ghonyad , Kusali
- Weeds: Bhutganjya ,Kena , Adhada , Tarota, Gajargawat in Gawathan area of 4.5 Hectares.
- Ploughing in 2,5hect area where Cynodon (Durva) grass was present.
- Enclosure for spotted deers prepared in which high % of weeds and taller grasses are present.
- 2,5 hectares cynodon grass was present but due to ploughing weeds are infested in deers enclosure.

Enclosure for spotted deers with weeds invasion not suitable habitat

Recommendation's

1. For spotted deer's they require smaller, palatable nutritive grasses with 20% taller grasses and green bushes for resting habitat.
2. Wild fruit trees
3. Browsing bushes wild.
4. There should not be ploughing in Protected Areas.
5. Weeds uprooting and restoration by Cynodon , Dicanthium , Ranbajara , Kodo , Ravi gawat
6. For spotted deers develop suitable grassland in enclosure.
7. Uproot weeds from gaothan area

Suitable grasses in Enclosure of Spotted Deers

Common recommendations for TATR Grasslands Management

1. Conserve old grasslands by proper management interventions
2. Weeds eradication before fruiting
3. Uproot weeds along roadside as well as from inside grasslands
4. After weeds eradication – restoration by good grasses with suitable grasses.
5. Brushwood management in suitable season
6. Jamani relief enclosures in grassland in rotational manner

7. Concentrate on wild leguminous plants to maintain positive association and composition of grasslands
8. Site specific interventions' required
9. Identify grasses with local names
10. Ecological restoration by grasses seeds
11. Monitoring of grasslands season wise
12. Documentation of management interventions
13. Training for frontline field staff 2 times per year.
14. Palasgaon grassland with proper inputs.
15. Botezari don't plough, select suitable grassland for rescue of spotted deers.
16. Geo-mapping of each grassland

Grasses of Tadoba-Andhari Tiger Reserve, Chandrapur

Sr. No.	Name of grass	Annual / perennial	Palatable /Non palatable
1	*Aristida funiculata*	Annual	Non Palatable
2	*Aristida reducta*	Annual	Non Palatable
3	*Apluda mutica*	Annual	Non Palatable
4	*Bothriochloa tuberosa*	Perennial	**Palatable**
5	*Bothriochloa pertusa*	Perennial	**Palatable**
6	*Brachiaria mutica*	Annual	**Palatable**
7	*Chloris barbata*	Annual	**Palatable**
8	*Chloris virgata*	Annual	**Palatable**
9	*Chloris gyana*	Annual	**Palatable**
10	*Chloris dolichostachya*	Annual	**Palatable**
11	*Dactyleptium aegypticum*	Annual	**Palatable**
12	*Digitaria stricta*	Annual	Non Palatable
13	*Digitaria bicornis*	Annual	**Palatable**
14	*Dicanthium annulatum*	Perennial	**Palatable**
15	*Dicanthium caricosum*	Perennial	**Palatable**
16	*Dicanthium persutum*	Perennial	**Palatable**
17	*Elusine indica*	Annual	**Palatable**
18	*Eragrostris viscosa*	Annual	Non Palatable
19	*E, gigantea*	Annual	Non Palatable
20	*E. unioiloides*	Annual	Non Palatable
21	*Eragrostellia biferia*	Annual	Non Palatable
22	*Heteropogon contortuds*	Annual	**Palatable**
23	*Iselima laxum*	Perennial	**Palatable**
24	*Iselima prostratum*	Perennial	**Palatable**
25	*Melanocenchrus jacequemontii*	Annual	Non Palatable
26	*Oplismenis compositus*	Annual	Non Palatable
27	*Rottbolia cochinchinensis*	Annual	Non Palatable
28	*Sporobolus paniculatus*	Annual	Non Palatable
29	*S. indica*	Annual	Non Palatable
30	*S, gigantea*	Annual	Non Palatable
31	*Eragrostis minor*	Annual	Non Palatable
32	*E. major*	Annual	Non Palatable
33	*Sacciolepis indica*	Annual	**Palatable**
34	*Setaris pumilla*	Annual	**Palatable**
35	*S, italica*	Annual	**Palatable**
36	*S, verticellata*	Annual	**Palatable**
37	*S. intermedia*	Annual	**Palatable**

38	*Panicum antidotale*	Annual	**Palatable**
39	*Coix aquatic*	Annual	**Palatable**
40	*Paspalum scrobiculatum*	Annual	**Palatable**
41	*Themeda laxa*	Annual	**Palatable**
42	*Themda quadrivalvis*	Annual	**Palatable**
43	*Themeda triandra*	Annual	**Palatable**
44	*Vitiveria zizanioides*	Perennial	Palatable
45	*Saccharum spontanium*	Perennial	Palatable
46	*Wild leguminous plants; Cajanus cajanoides*	Annual	
47	*Spodiopogon rhizophorus*	Annual	**Non palatable**
48	*Dimeria blatteri*	Annual	**Non palatable**
49	*Panicum 4 species*	Annual	**Palatable**
50	*Elusine eruciformis*	Annual	**Palatable**

ताडोबा – अंधारी
व्याघ्र प्रकल्पातील प्रजाती

रानमुग

फुलांचा कालावधी : सप्टेंबर – ऑक्टोबर

बियांचा कालावधी : नोव्हेंबर – जानेवारी

बीज गोळा करण्याचा कालावधी : नोव्हेंबर

उपयोगीता : नॉयट्रोजन फिक्सेशन इन सॉईल, मातीची सुपिकता वाढवणे, गवत पोषक बनविणे.

जंगली तूर

Cajanus cajanoides

फुलांचा कालावधी : सप्टेंबर – ऑक्टोबर

बियांचा कालावधी : नोव्हेंबर

बीज गोळा करण्याचा कालावधी : नोव्हेंबर – फेब्रुवारी

उपयोगीता : नॉयट्रोजन फिक्सेशन इन सॉईल, मातीची सुपिकता वाढवणे, गवत पोषक बनविणे.

रान बरबटी

Dolichos sinensis L.

फुलांचा कालावधी : सप्टेंबर – ऑक्टोबर

बियांचा कालावधी : नोव्हेंबर

बीज गोळा करण्याचा कालावधी : नोव्हेंबर – फेब्रुवारी

उपयोगीता : नॉयट्रोजन फिक्सेशन इन सॉईल, मातीची सुपिकता वाढवणे, गवत पोषक बनविणे.

रान उडीद

Vigna mungo

फुलांचा कालावधी : सप्टेंबर – ऑक्टोबर

बियांचा कालावधी : नोव्हेंबर – जानेवारी

बीज गोळा करण्याचा कालावधी : नोव्हेंबर

उपयोगीता : नॉयट्रोजन फिक्सेशन इन सॉईल, मातीची सुपिकता वाढवणे, गवत पोषक बनविणे.

रान खुळखुळा

Crotalaria juncea

फुलांचा कालावधी : सप्टेंबर – ऑक्टोबर

बियांचा कालावधी : नोव्हेंबर – जानेवारी

बीज गोळा करण्याचा कालावधी : नोव्हेंबर

उपयोगीता : नॉयट्रोजन फिक्सेशन इन सॉईल, मातीची सुपिकता वाढवणे, गवत पोषक बनविणे.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9°21'25"E
9.03 m
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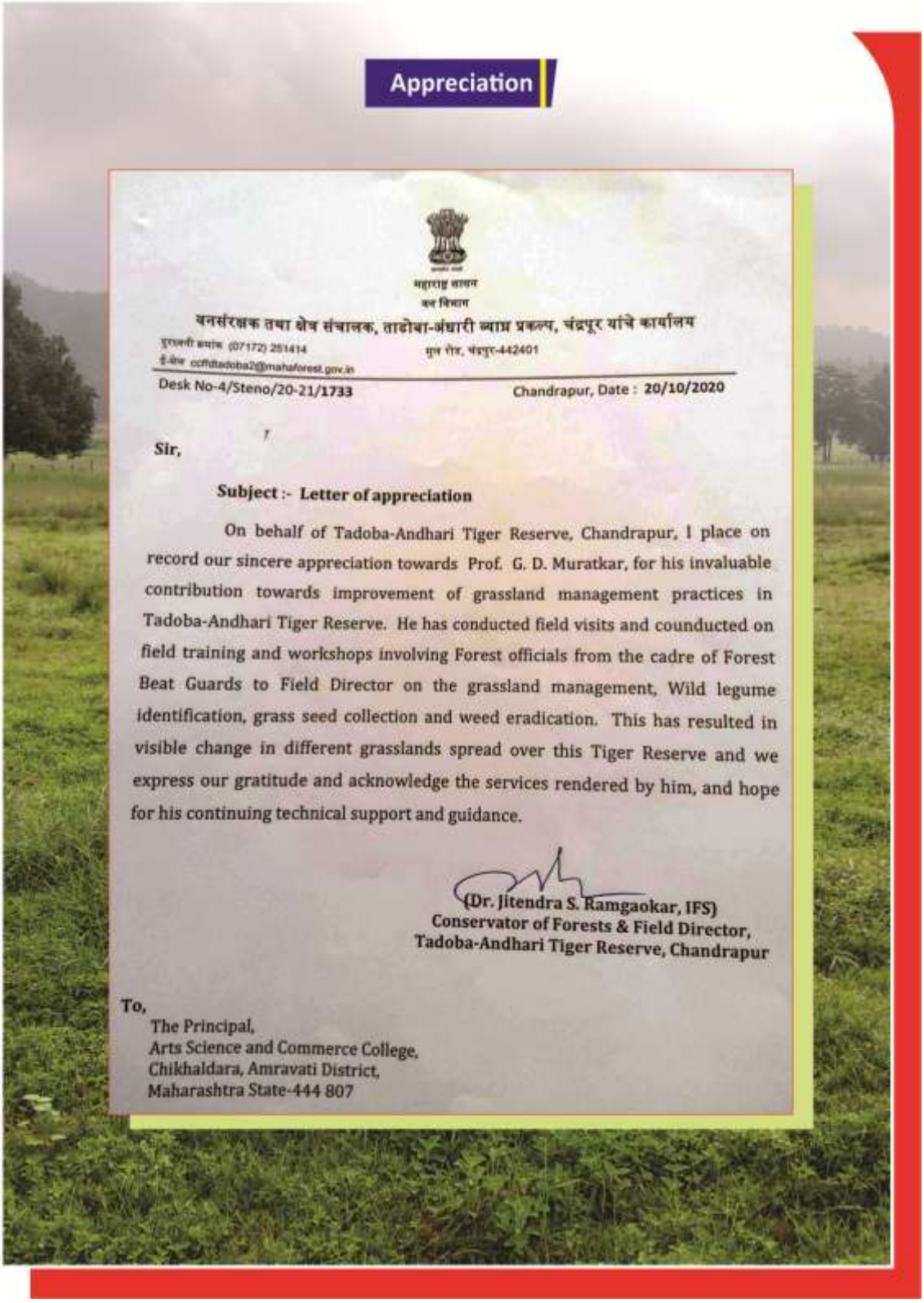
Ecological Resttoration of Platable Grasses in Pandharpauni (TATR)

Appreciation



महाराष्ट्र शासन
वन विभाग

वनसंरक्षक तथा क्षेत्र संचालक, ताडोबा-अंधारी व्याघ्र प्रकल्प, चंद्रपूर यांचे कार्यालय

दूरध्वनी क्रमांक (07172) 251414 मुल रोड, चंद्रपूर-442401
ई-मेल ccftdtadoba2@mahaforest.gov.in

Desk No-4/Steno/20-21/1733 Chandrapur, Date : 20/10/2020

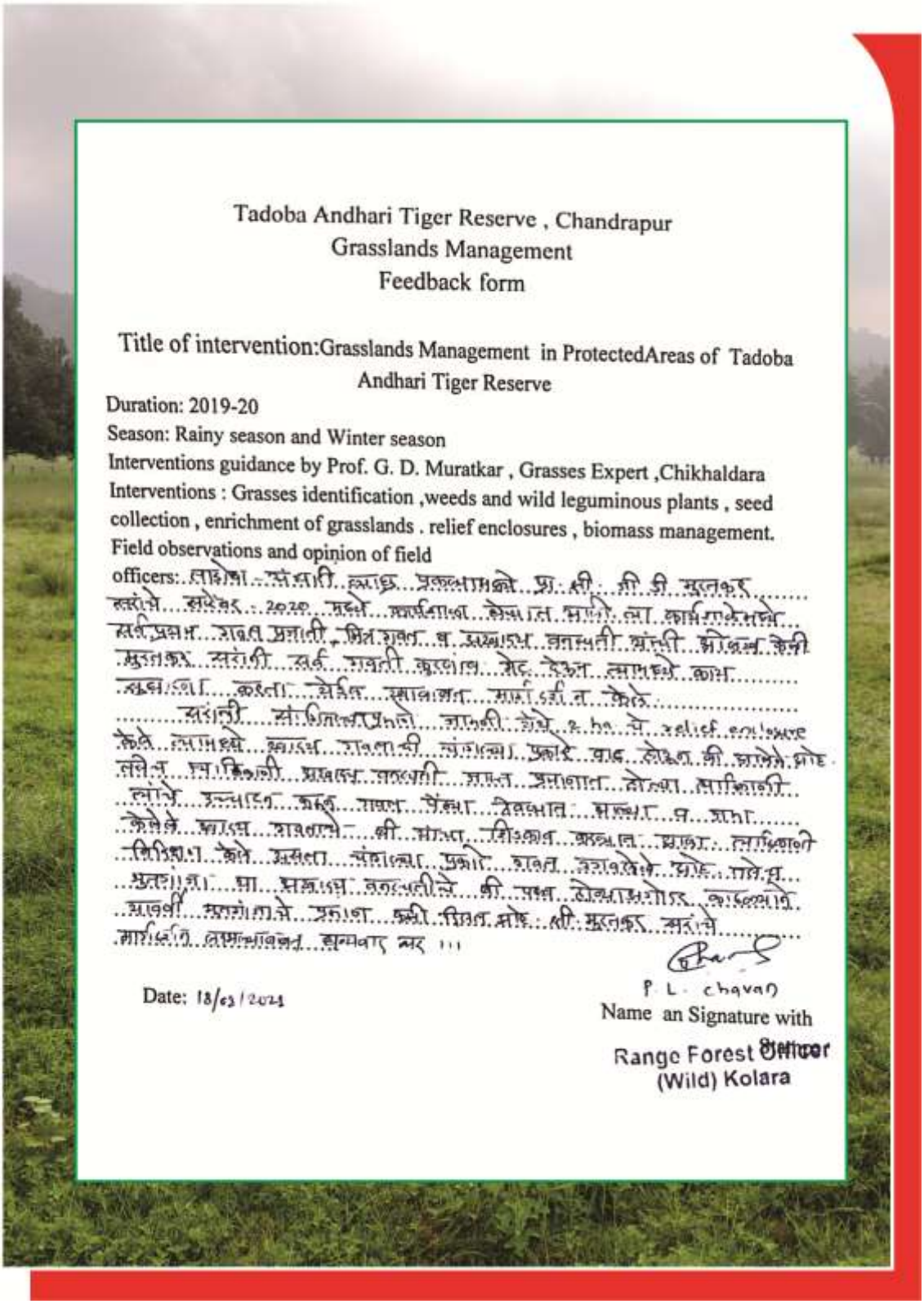
Sir,

Subject :- Letter of appreciation

On behalf of Tadoba-Andhari Tiger Reserve, Chandrapur, I place on record our sincere appreciation towards Prof. G. D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Tadoba-Andhari Tiger Reserve. He has conducted field visits and counducted on field training and workshops involving Forest officials from the cadre of Forest Beat Guards to Field Director on the grassland management, Wild legume identification, grass seed collection and weed eradication. This has resulted in visible change in different grasslands spread over this Tiger Reserve and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

(Dr. Jitendra S. Ramgaokar, IFS)
Conservator of Forests & Field Director,
Tadoba-Andhari Tiger Reserve, Chandrapur

To,
The Principal,
Arts Science and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State-444 807



Tadoba Andhari Tiger Reserve , Chandrapur
Grasslands Management
Feedback form

Title of intervention:Grasslands Management in ProtectedAreas of Tadoba Andhari Tiger Reserve

Duration: 2019-20

Season: Rainy season and Winter season

Interventions guidance by Prof. G. D. Muratkar , Grasses Expert ,Chikhaldara

Interventions : Grasses identification ,weeds and wild leguminous plants , seed collection , enrichment of grasslands . relief enclosures , biomass management.

Field observations and opinion of field officers:

Date: 18/03/2021

P L Chavan
Name an Signature with
Range Forest Officer
(Wild) Kolara

ताडोबा- अंधारी व्याघ्र प्रकल्प, —चंद्रपूर
कुरण व्यवस्थापन

अभिप्राय पत्रक

विषय- ताडोबा अंधारी व्याघ्र प्रकल्पातील राखीव वनात गवती कुरण व्यवस्थापन
सत्र- 2019-2020
हंगाम- पावसाळी हंगाम व हिवाळी हंगाम
मार्गदर्शक- श्री. जि.डी. मुरतकर गवत तज्ञ, चिखलदरा.
मार्गदर्शन विषय- गवतांची ओळख, अखाद्य व रोगकारक वनस्पती, गवतबियाणे संकलन, गवती कुरणाचे संवर्धन, बंदिस्त कुरण व्यवस्थापन, गवती पट्टे व्यवस्थापन, प्लॉट निरीक्षण, व कुरण विकास कामा विषयी मार्गदर्शन करणे.

अभिप्राय :-

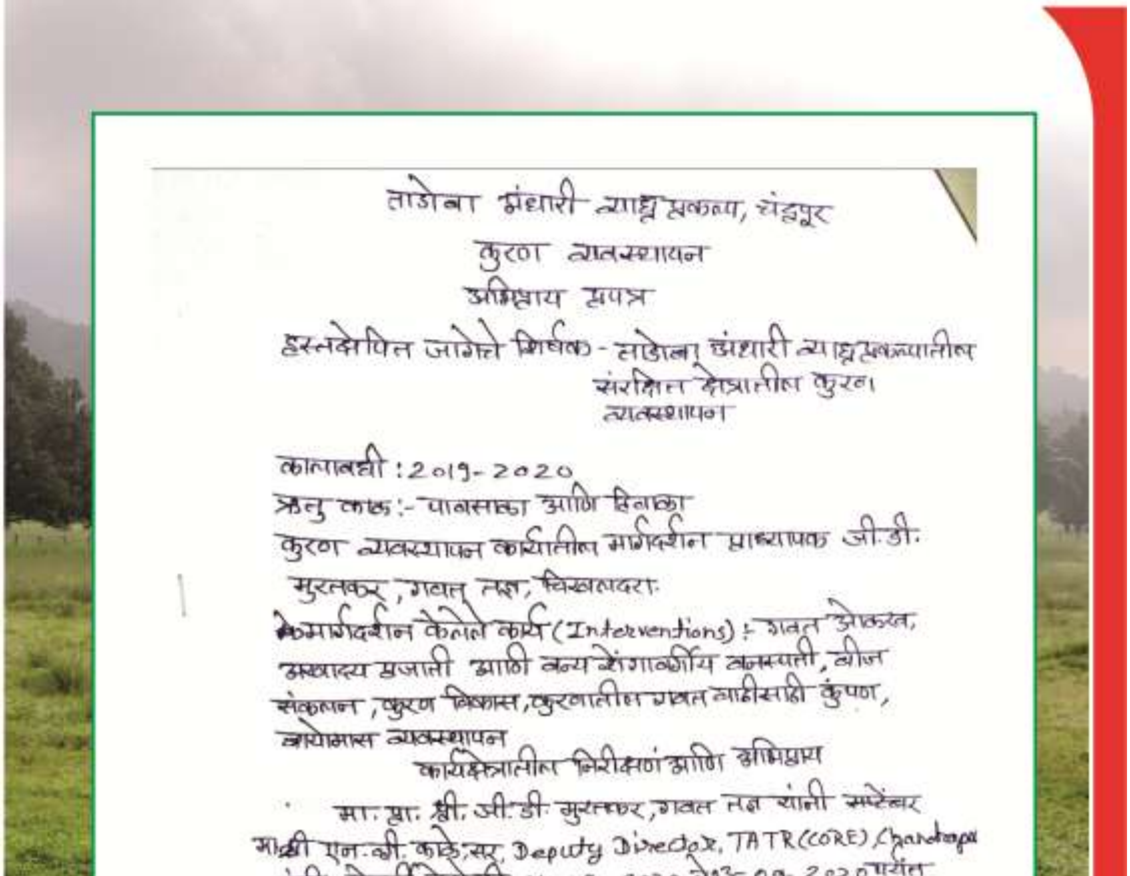
श्री. जि.डि. मुरतकर सरांनी मागील वर्षी सन-2020 मधील सप्टेंबर मध्ये कार्यशाळे मध्ये गवता बाबत मार्गदर्शन केले. सर्वप्रथम गवत कसे ओळखावे, गवतांची नावे या बाबत उत्कृष्ट असे मार्गदर्शन केले. तसेच गवताला नुकसान करणारे अखाद्य बाबत ओळख करून दिली. त्यांचे उच्चाटन कसे करायचे या बाबत सुद्धा छान मार्गदर्शन केले.

कोळसा वनपरिक्षेत्रात श्री. मुरतकर सरांनी क्षेत्रीय दौऱ्या दरम्यान निरीक्षणात कोळसा येथील कुरण क्षेत्रातील विविध प्रकारच्या गवत प्रजातींची तसेच गवत बीयांची ओळख करून दिली. त्यांनी दिलेल्या सुचने प्रमाणे अखाद्य निर्मुलनाची कामे यशस्वीरित्या करण्यात आली. त्यामुळे कुरण क्षेत्रातील अखाद्याचे प्रमाण कमी झाल्याने, कुरणा मध्ये वन्यप्राण्यांची संख्या वाढत असल्याचे दिसून येत आहे. त्याच प्रमाणे पर्यटन रस्ते व गस्ती रस्ते यांचे दोन्ही बाजुचे ठिकाणी अखाद्य काढण्याचे काम केल्याने दोन्ही बाजुला फक्त गवत अशा प्रकारे आकर्षक गवत असणारे वन्यप्राणी पर्यटकांना जवळुन बघता येत आहेत, व नजारे सुद्धा फार सुंदर दिसु लागलेले आहेत. श्री. मुरतकर सरांचे उत्कृष्ट मार्गदर्शना मुळे गवत प्रजातीचे प्रमाण वाढत असुन, त्यांनी करून दिलेल्या नियोजना मुळे कुरण विकासाची कामे करण्यास खुप मदत होत आहे.

धन्यवाद सर, या पुढे सुद्धा आम्हाला आपले मार्गदर्शन सदैव लाभो ही विनंती. आपण केलेल्या मार्गदर्शना मुळे ताडोबाचे नाव अधिका अधिक वर जाईल. (अधिक प्रसिद्ध होईल).

दिनांक- 13/8/2021
स्थळ - कोळसा

दि. घ. रामटेके
वनपरिक्षेत्र अधिकारी



ताडोबा अंधारी व्याघ्र प्रकल्प, चंद्रपूर
कुरण व्यवस्थापन
अभिप्राय प्रपत्र

हस्तक्षेपित जागेचे शिर्षक - ताडोबा अंधारी व्याघ्र प्रकल्पातील संरक्षित क्षेत्रातील कुरण व्यवस्थापन

कालावधी : 2019-2020
ऋतु काळ :- पावसाळा आणि हिवाळा
कुरण व्यवस्थापन कार्यातील मार्गदर्शन प्राध्यापक जी.डी. मुरतकर, गवत तज्ञ, चिखलदरा.
मार्गदर्शन केलेले कार्य (Interventions) :- गवत ओळख, अखाद्य प्रजाती आणि अन्य वेगवर्गीय वनस्पती, बीज संकलन, कुरण विकास, कुरणातील गवत वाढीसाठी कुंपण, बायोमास व्यवस्थापन

कार्यक्षेत्रातील निरीक्षणं आणि अभिप्राय

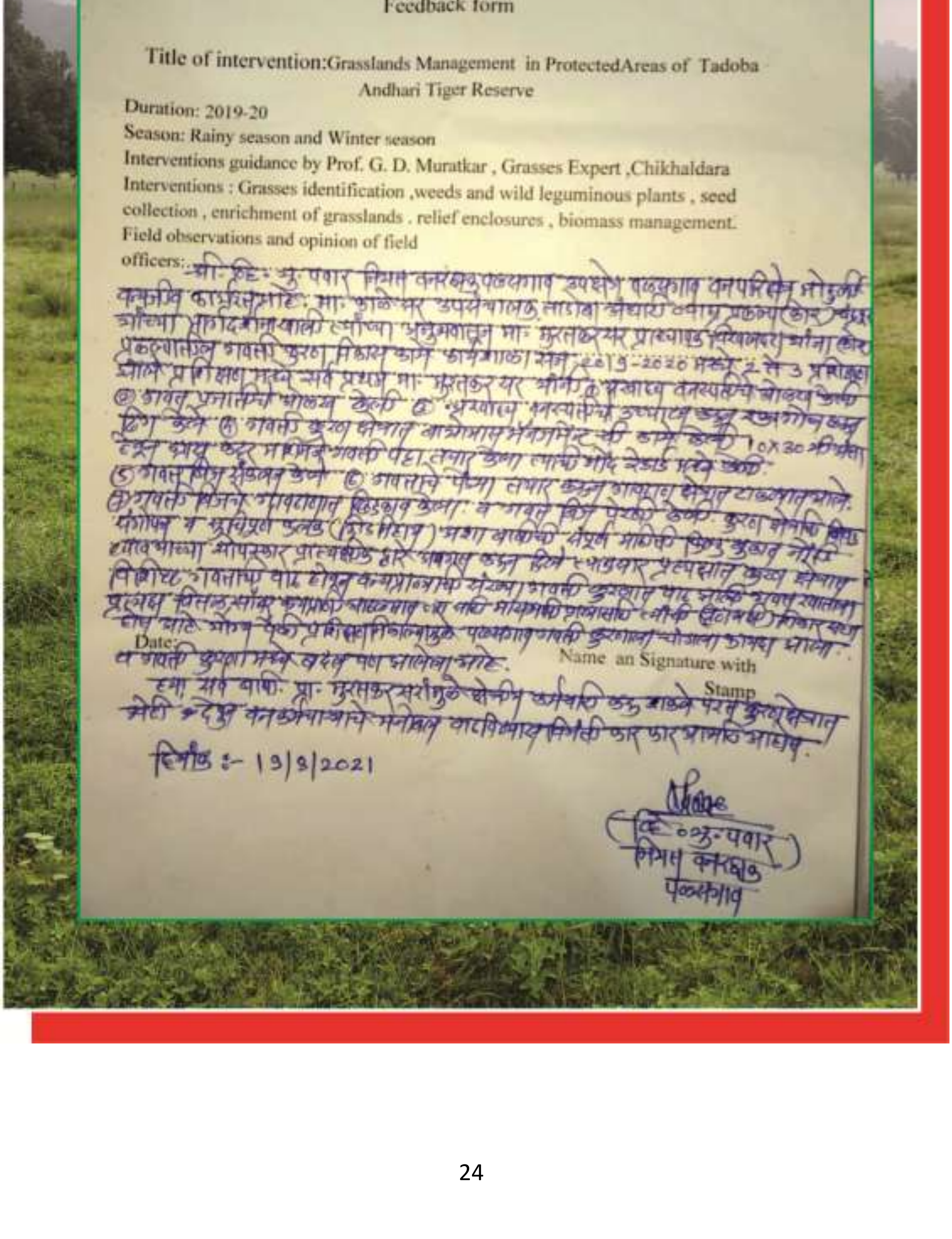
मा. प्रा. श्री. जी.डी. मुरतकर, गवत तज्ञ यांनी सप्टेंबर मध्ये श्री एन.वी. काळे सर, Deputy Director, TATR(CORE) Chandrapur यांनी मोहर्ली येथे दि. 01-09-2020 ते 03-09-2020 पर्यंत कुरण विकास व व्यवस्थापन या विषयावर आयोजित केलेल्या कार्यशाळेत आम्हास मार्गदर्शन केले.

कार्यशाळेत गवत प्रजातींची ओळख प्रत्यक्ष कार्य क्षेत्रात फील्ड करवून दिली. तसेच गवत मीत्र, अखाद्य वनस्पतींची प्रजाती, तण प्रजाती इ. ची ओळख त्यांनी आम्हा वनकर्मचाऱ्यांना करवून दिली. ओळख झाल्या नंतर आमची गवताबद्दील रुची वाढली. प्रत्येक वनकर्मचारी गवत प्रजाती मध्ये रस घेवू लागला. प्रत्येक गवताची खास ओळख झाली. यात श्री. मुरतकर सर यांचा सिंहाचा वाटा आहे.

सरांनी कुरणामध्ये तसेच रस्त्याच्या दुतर्फा असलेल्या उपटून काढलेल्या ठिकाणी गवताच्या पेंड्या तसेच गवत बी टाकण्यास सांगितले, तेव्हाच गवत तर कार्यक्षेत्रात जावत त्याचे

दि. 18-08-2021

Range Forest Officer
Karwa (Wildlife)



Tadoba Andhari Tiger Reserve , Chandrapur
Grasslands Management
Feedback form

Title of intervention: Grasslands Management in Protected Areas of Tadoba Andhari Tiger Reserve

Duration: 2019-20

Season: Rainy season and Winter season

Interventions guidance by Prof. G. D. Muratkar , Grasses Expert ,Chikhaldara

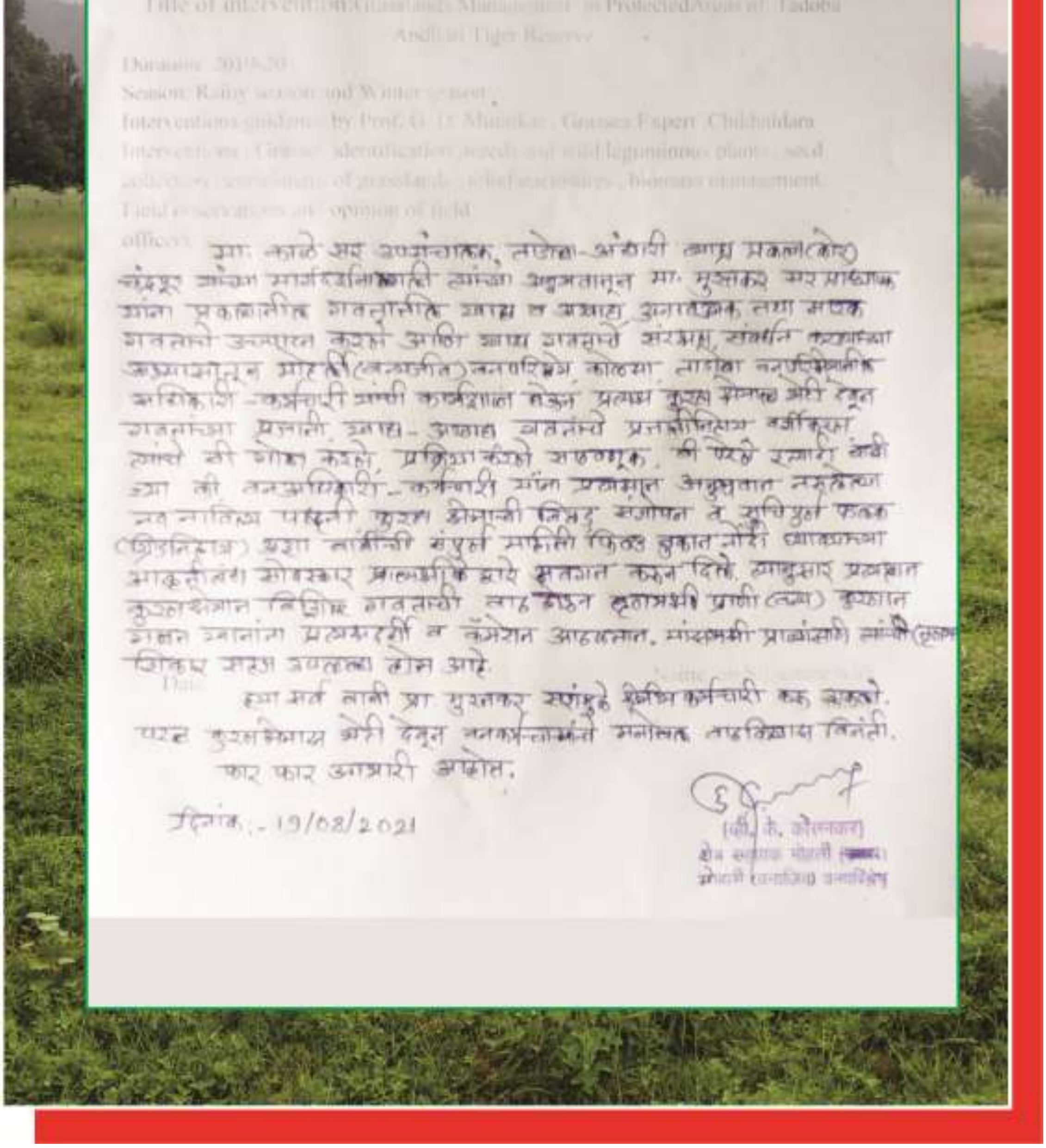
Interventions : Grasses identification ,weeds and wild leguminous plants , seed collection , enrichment of grasslands . relief enclosures , biomass management.

Field observations and opinion of field officers: श्री. डि. अ. पवार नियत वनरक्षक पळसगाव उपक्षेत्र पळसगाव वनपरिक्षेत्र मोहुर्ली कार्यरत आहे. मा. [illegible] उपसंचालक ताडोबा अंधारी व्याघ्र प्रकल्प कोर [illegible] यांच्या मार्गदर्शनाखाली त्यांच्या अनुभवातून मा. मुरतकर सर प्राध्यापक चिखलदरा यांना कोर प्रकल्पातील गवती कुरण विकास काम कार्यशाळा सन 2019-2020 मध्ये 2 ते 3 प्रशिक्षण झाले [illegible]

Date: दिनांक :- 13/8/2021

Name an Signature with Stamp

(डि. अ. पवार)
नियत वनरक्षक
पळसगाव



Tadoba Andhari Tiger Reserve, Chandrapur
Grasslands Management
Feedback form

Title of intervention: Grasslands Management in Protected Areas of Tadoba Andhari Tiger Reserve

Duration: 2019-20
Season: Rainy season and Winter season
Interventions guidance by Prof. G. D. Muratkar, Grasses Expert, Chikhaldara
Interventions: Grasses identification, weeds and wild leguminous plants, seed collection, enrichment of grasslands, relief ... , biomass management.
Field observations and opinion of field officers:

प्रा. काळे सर उपसंचालक, ताडोबा-अंधारी व्याघ्र प्रकल्प (कोर) चंद्रपूर यांच्या मार्गदर्शनाखाली त्यांच्या अनुभवातून मा. मुरतकर सर प्राध्यापक यांना प्रकाशित गवताविषयी खाद्य व अखाद्य उनातक, तसा मापक गवताचे उत्पादन करणे आणि खाद्य गवतामध्ये संरक्षण, संवर्धन करण्याच्या अभ्यासातून माहिती (तज्ज्ञांनी) वनपरिक्षेत्र कोळसा, ताडोबा वनपरिक्षेत्रातील अधिकारी - कर्मचारी यांची कार्यशाळा घेऊन प्रत्यक्ष कुरण क्षेत्र भेटी देवून गवतांच्या प्रजाती, खाद्य - अखाद्य गवतांचे प्रजातीनिहाय वर्गीकरण त्यांचे बी गोळा करणे, प्रक्रिया करणे, साठवणूक, बी पेरणे इत्यादी बाबी ह्या वनअधिकारी - कर्मचारी यांना प्रत्यक्षात अवगत नसलेल्या नवनाविन्य पद्धती कुरण क्षेत्राची निगा, संगोपन व गुणवत्तापूर्ण फलक (प्रजातीनिहाय) अशा बाबींची संपूर्ण माहिती फिल्ड बुकात नोंदी घ्यावयाच्या आकृतीसह सोबतकार प्रात्यक्षिक द्वारे अवगत करून दिले. त्यानुसार प्रत्यक्षात कुरणक्षेत्रात विविध गवतांची वाढ होऊन तृणभक्षी प्राणी (वन्य) कुरणात ... त्यांना प्रत्यक्षदर्शी व कॅमेरात आढळतात. मांसभक्षी प्राण्यांसाठी त्यांची (तृणभक्षी) शिकार सहज उपलब्ध होत आहे.

Date

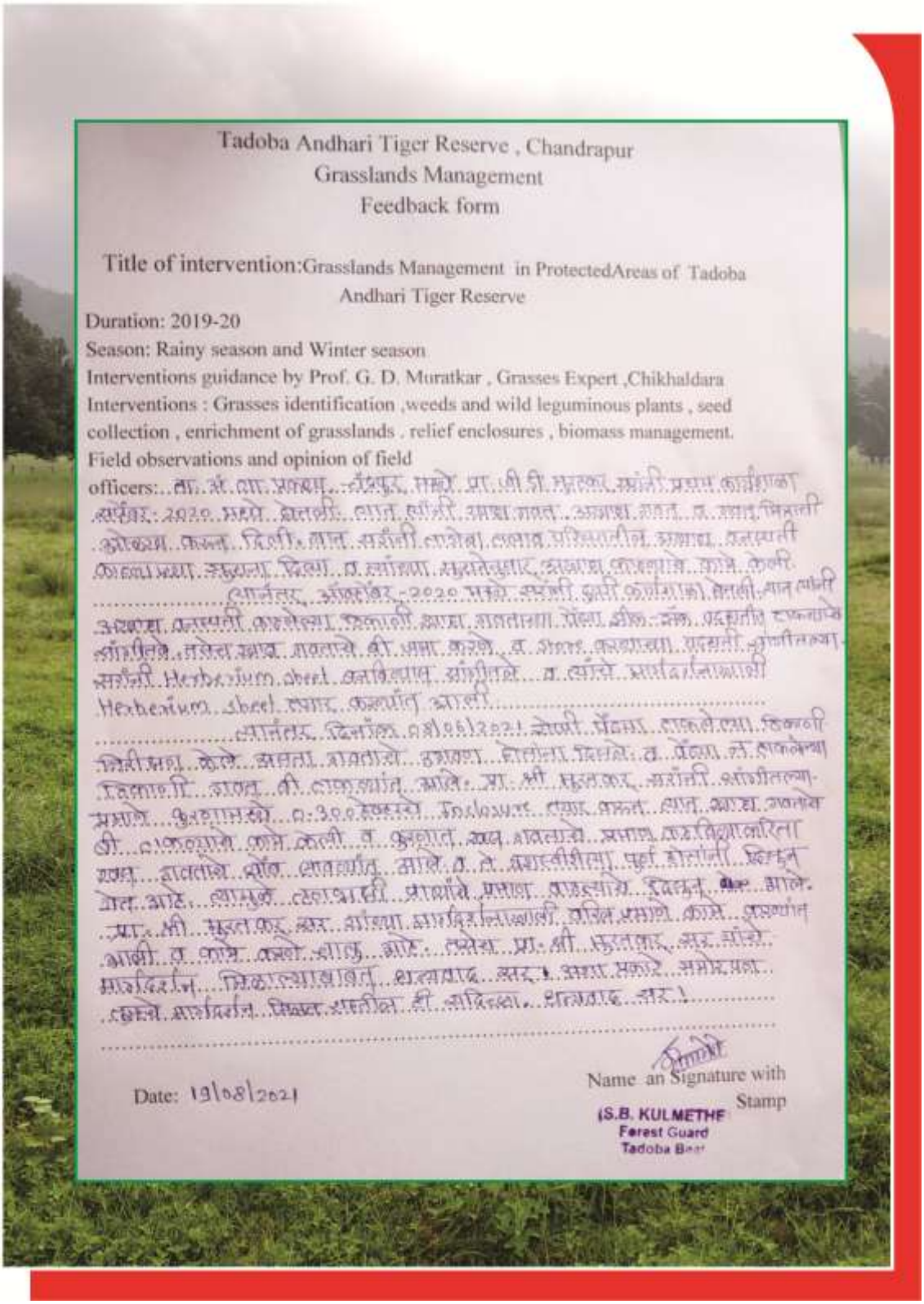
Name and Signature

ह्या सर्व बाबी प्रा. मुरतकर सरांमुळे क्षेत्रिय कर्मचारी करू शकतो. परंतु कुरणविकास भेटी देवून वनकर्मचाऱ्यांना मनोबल वाढविण्यास विनंती.

फार फार आभारी आहोत.

दिनांक :- 19/08/2021

(डी. के. कोसनकर)
क्षेत्र सहायक मोहर्ली [illegible]
मोहर्ली [illegible] वनपरिक्षेत्र



Tadoba Andhari Tiger Reserve , Chandrapur
Grasslands Management
Feedback form

Title of intervention: Grasslands Management in ProtectedAreas of Tadoba Andhari Tiger Reserve

Duration: 2019-20

Season: Rainy season and Winter season

Interventions guidance by Prof. G. D. Muratkar , Grasses Expert ,Chikhaldara

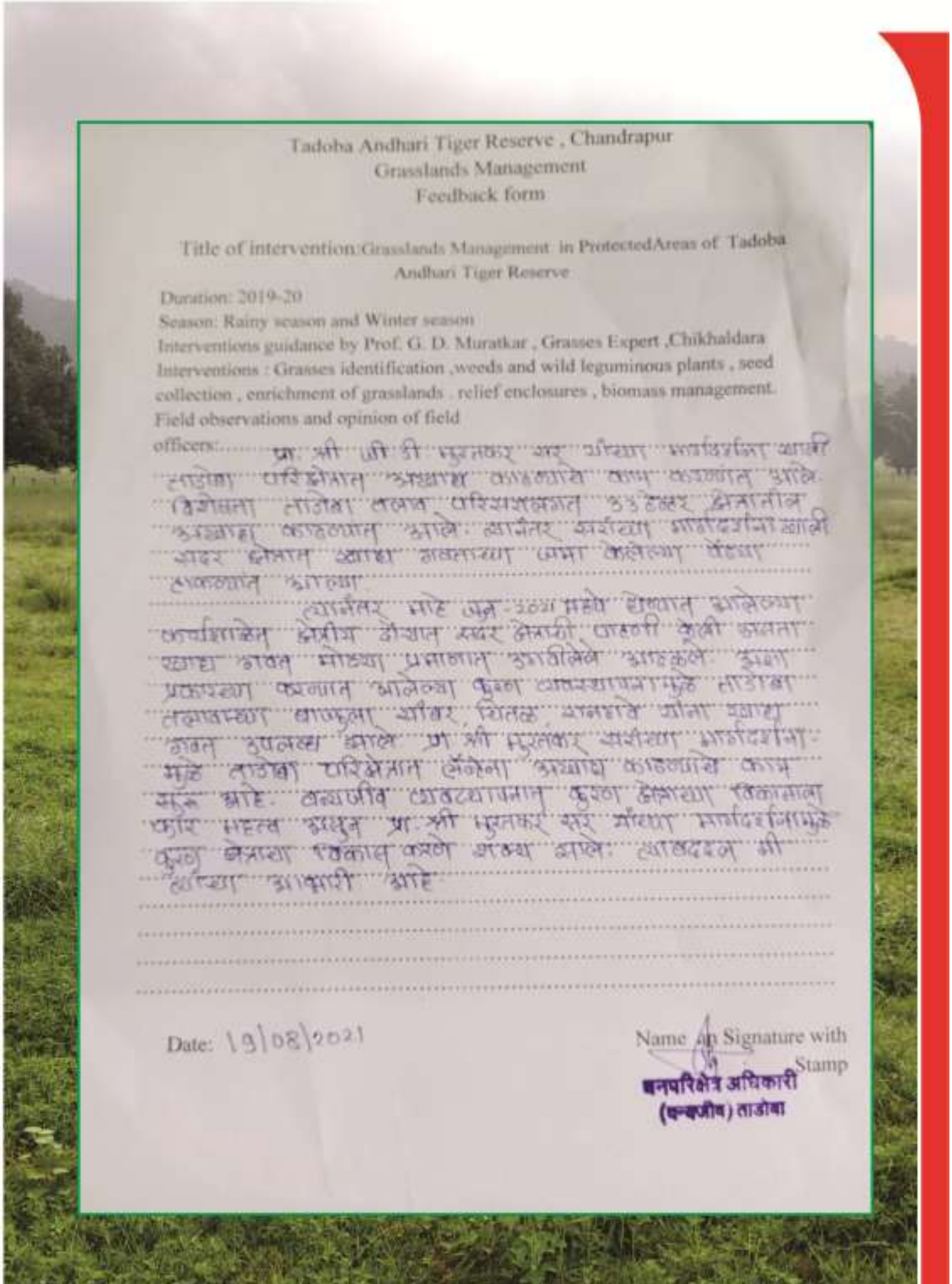
Interventions : Grasses identification ,weeds and wild leguminous plants , seed collection , enrichment of grasslands , relief enclosures , biomass management.

Field observations and opinion of field officers:

Date: 19/08/2021

Name an Signature with Stamp

S.B. KULMETHE
Forest Guard
Tadoba Beat



Tadoba Andhari Tiger Reserve , Chandrapur
Grasslands Management
Feedback form

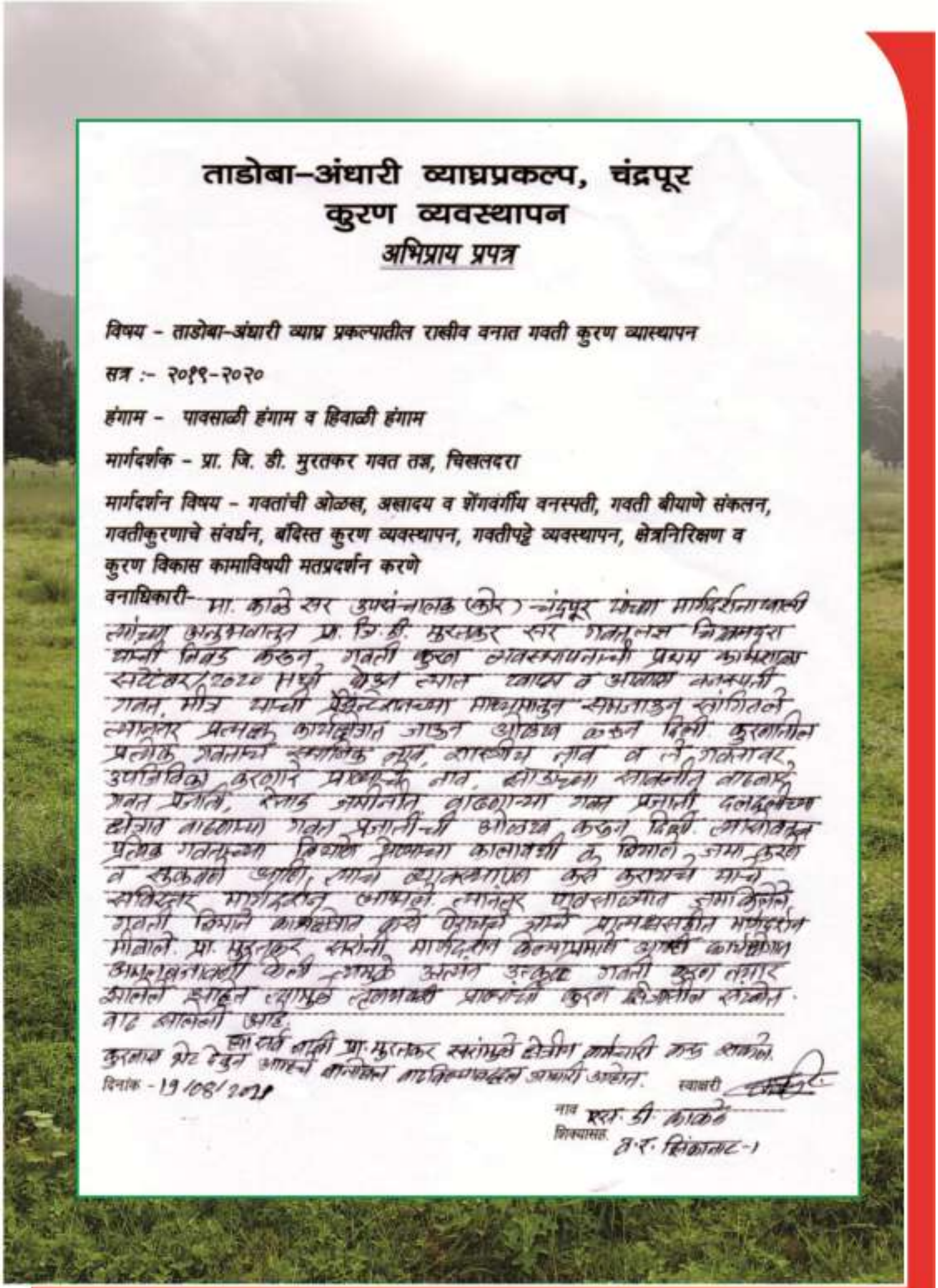
Title of intervention:Grasslands Management in ProtectedAreas of Tadoba Andhari Tiger Reserve

Duration: 2019-20
Season: Rainy season and Winter season
Interventions guidance by Prof. G. D. Muratkar , Grasses Expert ,Chikhaldara
Interventions : Grasses identification ,weeds and wild leguminous plants , seed collection , enrichment of grasslands . relief enclosures , biomass management.
Field observations and opinion of field officers: प्रा. श्री जी डी मुरतकर सर यांच्या मार्गदर्शनाखाली ताडोबा परिक्षेत्रात अवांछित काढण्याचे काम करण्यात आले. विशेषतः ताडोबा तलाव परिसरालगत ३३ हेक्टर क्षेत्रातील अवांछित काढण्यात आले. त्यानंतर सरांच्या मार्गदर्शनाखाली सदर क्षेत्रात चारा गवताच्या जमा केलेल्या बियाण्या टाकण्यात आल्या

त्यानंतर माहे जून-२०२१ मध्ये घेण्यात आलेल्या कार्यशाळेत क्षेत्रीय दौऱ्यात सदर क्षेत्राची पाहणी केली असता खाद्य गवत मोठ्या प्रमाणात उगविलेले आढळले. अशा प्रकारच्या करण्यात आलेल्या कुरण व्यवस्थापनामुळे ताडोबा तलावाच्या बाजूला सांबर, चितळ, रानगवे यांना खाद्य गवत उपलब्ध झाले. प्रा श्री मुरतकर सरांच्या मार्गदर्शनामुळे ताडोबा परिक्षेत्रात लँटेना अवांछित काढण्याचे काम सुरू आहे. वन्यजीव व्यवस्थापनात कुरण क्षेत्राच्या विकासाला फार महत्व असून प्रा. श्री मुरतकर सर यांच्या मार्गदर्शनामुळे कुरण क्षेत्राचा विकास करणे शक्य झाले. त्याबद्दल मी त्यांच्या आभारी आहे

Date: 19/08/2021

Name and Signature with Stamp
वनपरिक्षेत्र अधिकारी
(वन्यजीव) ताडोबा



ताडोबा-अंधारी व्याघ्रप्रकल्प, चंद्रपूर

कुरण व्यवस्थापन

अभिप्राय प्रपत्र

विषय - ताडोबा-अंधारी व्याघ्र प्रकल्पातील राखीव वनात गवती कुरण व्यास्थापन

सत्र :- २०१९-२०२०

हंगाम - पावसाळी हंगाम व हिवाळी हंगाम

मार्गदर्शक - प्रा. जि. डी. मुरतकर गवत तज्ञ, चिखलदरा

मार्गदर्शन विषय - गवतांची ओळख, अखादय व शेंगवर्गीय वनस्पती, गवती बीयाणे संकलन, गवतीकुरणाचे संवर्धन, बंदिस्त कुरण व्यवस्थापन, गवतीपट्टे व्यवस्थापन, क्षेत्रनिरिक्षण व कुरण विकास कामाविषयी मतप्रदर्शन करणे

वनाधिकारी- मा. काळे सर उपसंचालक (कोर) चंद्रपूर यांच्या मार्गदर्शनाखाली त्यांच्या अनुभवातुन प्रा. जि.डी. मुरतकर सर गवततज्ञ चिखलदरा यांची निवड करुन, गवती कुरण व्यवस्थापनाची प्रथम कार्यशाळा सप्टेंबर/२०२० मध्ये घेण्यात आली. खाद्य व अखाद्य वनस्पती गवत, मित्र यांची प्रेझेंटेशनच्या माध्यमातुन समजाऊन सांगितले त्यानंतर प्रत्यक्ष कार्यक्षेत्रात जाऊन ओळख करुन दिली. कुरणातील प्रत्येक गवताचे स्थानिक नाव, शास्त्रीय नाव व ते गवतावर उपजिविका करणारे प्राण्याचे नाव, डोंगराच्या उतारावरील वाढणारे गवत प्रजाती, सपाट जमीनीत वाढणाऱ्या गवत प्रजाती दलदलीच्या क्षेत्रात वाढणाऱ्या गवत प्रजातींची ओळख करुन दिली. त्यासोबत प्रत्येक गवताच्या बियाणे गोळा करण्याचा कालावधी व बियाणे जमा करणे व सुकवणे आणि, त्याचा व्यवस्थापन कसे करायचे याचे सविस्तर मार्गदर्शन लाभले. त्यानंतर पावसाळ्यात जमा केलेले गवती बियाणे कार्यक्षेत्रात कसे पेरायचे याचे प्रत्यक्षसहीत मार्गदर्शन मिळाले. प्रा. मुरतकर सरांनी मार्गदर्शन केल्याप्रमाणे आम्ही कार्यक्षेत्रात अंमलबजावणी केली त्यामुळे अत्यंत उत्कृष्ट गवती कुरण तयार झालेले असून त्यामुळे तृणभक्षी प्राण्यांची कुरण क्षेत्रातील संख्येत वाढ झालेली आहे.

या सर्व बाबी प्रा. मुरतकर सरांमुळे होतीन कार्यकारी करू शकलो. कुरणात भेट देवुन आमचे वनविभाग मार्गदर्शनाबद्दल आभारी आहोत.

दिनांक - 19/08/2021

स्वाक्षरी

नाव एस. डी. काकडे

नियतक्षेत्र ब.र. सिंकाटार-1

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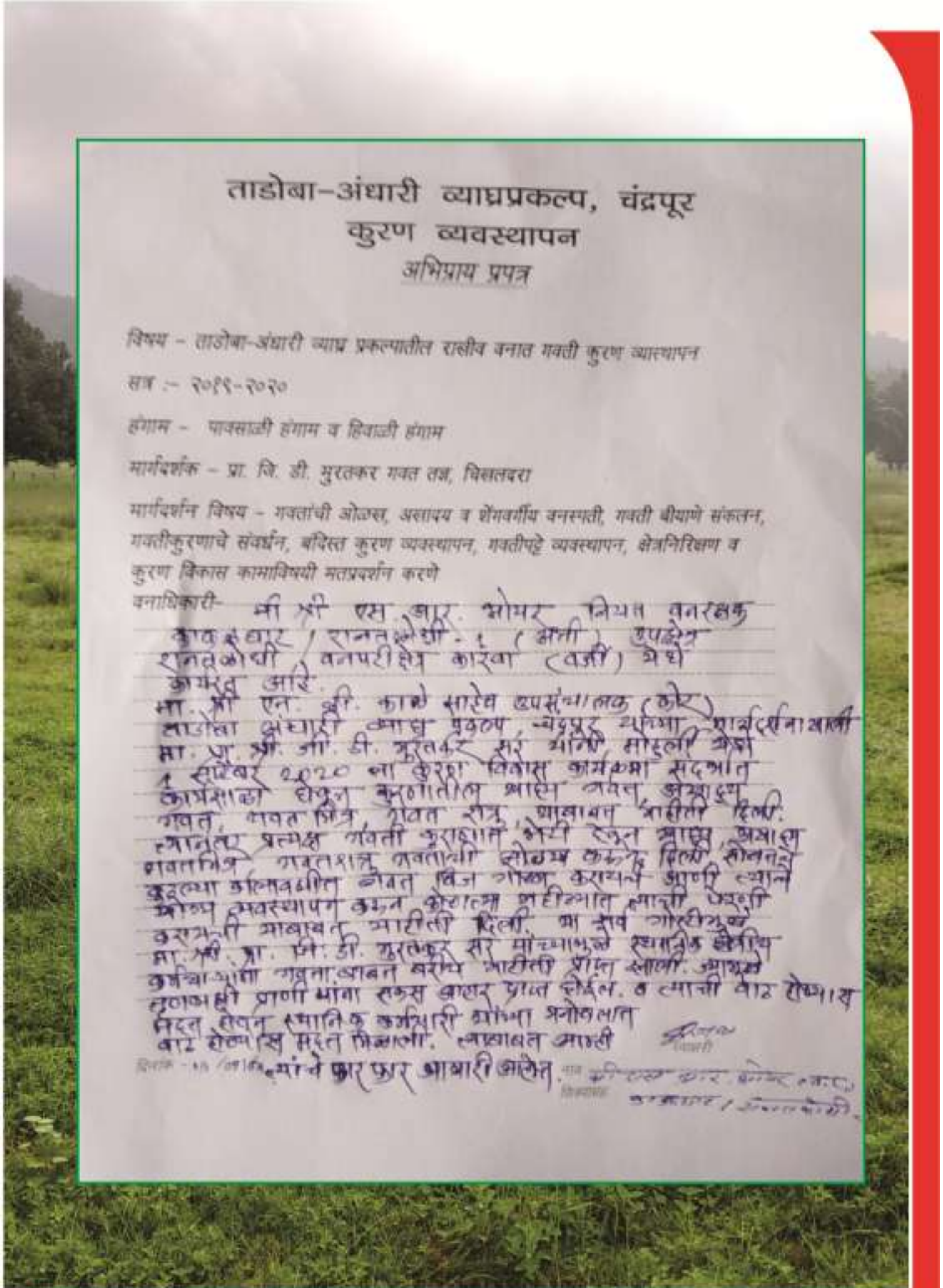

ताडोबा–अंधारी व्याघ्रप्रकल्प, चंद्रपूर
कुरण व्यवस्थापन
अभिप्राय प्रपत्र

विषय – ताडोबा-अंधारी व्याघ्र प्रकल्पातील राखीव वनात गवती कुरण व्यवस्थापन

सत्र :– २०१९-२०२०

हंगाम – पावसाळी हंगाम व हिवाळी हंगाम

मार्गदर्शक – प्रा. वि. डी. मुरतकर गवत तज्ञ, चिखलदरा

मार्गदर्शन विषय – गवतांची ओळख, अखाद्य व शेंगवर्गीय वनस्पती, गवती बीयाणे संकलन, गवतीकुरणाचे संवर्धन, बंदिस्त कुरण व्यवस्थापन, गवतीपट्टे व्यवस्थापन, क्षेत्रनिरिक्षण व कुरण विकास कामाविषयी मतप्रदर्शन करणे

वनाधिकारी- मी श्री एस. आर. भोमर नियत वनरक्षक कारवा / रानतळोधी - १ (कोर) उपक्षेत्र रानतळोधी / वनपरीक्षेत्र कारवा (बफर) येथे कार्यरत आहे.
मा. श्री एन. आर. काळे साहेब उपसंचालक (कोर) ताडोबा अंधारी व्याघ्र प्रकल्प, चंद्रपूर यांच्या मार्गदर्शनाखाली मा. प्रा. श्री. जी. डी. मुरतकर सर यांनी मोहुर्ली येथे १ सप्टेंबर 2020 ला कुरण विकास कार्यक्रमा संदर्भात कार्यशाळा घेऊन कुरणातील खाद्य गवत, अखाद्य गवत, गवत मित्र, गवत शत्रू, याबाबत माहिती दिली. त्यानंतर प्रत्यक्ष गवती कुरणात भेटी देऊन खाद्य, अखाद्य गवतमित्र, गवतशत्रू गवतांची ओळख करून दिली, तोडलेल्या कालावधीत गवत बिज गोळा करायचे आणि त्याने योग्य व्यवस्थापन करून कोणत्या महिन्यात त्याची पेरणी करायची याबाबत माहिती दिली. या सर्व गोष्टीमुळे मा. श्री. प्रा. जी. डी. मुरतकर सर यांच्यामुळे स्थानिक क्षेत्रिय कर्मचाऱ्यांना गवताबाबत बरीच माहिती प्राप्त झाली. त्यामुळे तृणभक्षी प्राणी यांना सकस आहार प्राप्त होईल. व त्याची वाढ होण्यास मदत होऊन स्थानिक कर्मचारी यांच्या मनोबलात वाढ होण्यास मदत मिळाली. त्याबाबत आम्ही यांचे फार फार आभारी आहोत.

स्वाक्षरी

दिनांक - [illegible] नाव [illegible]
हुद्दा [illegible]

Tadoba
Grasslands Management







Appreciation

R. SOBHA, IFS
Principal Chief Conservator Of Forests
(Head Of Forest Force)

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Fax : 040 23231851
Mob : 94 91 05 3220
pccftelangana@gmail.com

LETTER OF APPRECIATION
DATED:29.08.2020

My sincere appreciation to Prof. Gajanan Dadaraoji Muratkar of Maharashtra.

Thank you very much for delivering on informative and thought provoking session through Zoom Webinar on **"Grassland Development and Management – Challenges & Solutions"** held on 29th August, 2020 facilitated by Telangana State Forest Academy, Dulapally, Hyderabad.

It was a splendid detailed presentation and interaction with Forest Department officials of Telangana State with good field practices.

Your passionate sharing on Grassland Development and Management is always an inspiration to us. All the department officers have appreciated and got benefitted from your views and vast experiences in the field of Grassland Management.

Looking forward for your cooperation for the promotion and imparting professional expertise in future as well.

With best wishes
R. Sobha
(R. SOBHA)

Appreciation

Dr G. Chandrashekar Reddy, I.F.S.
Addl.PCCF & Director (FAC)

Telangana State Forest Academy
Government of Telangana,
Dulapally, Hyderabad – 500 100
Mob : +91- 9948919666
Land Line (O) : 040 - 29704896
e-mail : tsfa.hyd@gmail.com

Date: 29.08.2020

Letter of Appreciation

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(Dr G. Chandrashekar Reddy, IFS)
APCCF/Director

Appreciation

Sri C.P. VINOD KUMAR, I.F.S.,
Field Director Project Tiger,
Kawal Tiger Reserve

Forest Complex
Nirmal – 504 106
Telangana
e-mail : fdptkawal@gmail.com

Date: 01.10.2020

To,

Dr. G.D. Muratkar
Grassland Ecologist
Chilkhaldara, Amaravati District,
Maharashtra State – 444 807

Dear Sir,

Thank You for taking time and visiting the Kawal Tiger Reserve, Telangana during 27.09.2020 to 30.09.2020. I sincerely appreciate the time you spent in training the staff and field visits to grasslands developed in Kawal Tiger Reserve. Your visit has given lot of practical field guidance to all the staff up to Forest Beat Officer level and also Protection watchers.

Your visit has given guidance to all of us in further improving, developing and maintaining grasslands in Kawal Tiger Reserve.

Under your guidance our team will definitely increase the grasslands for improving the prey population in the Kawal Tiger Reserve. We all look forward for your further visit to Kawal Tiger Reserve.

With Regards,

Yours Sincerely

01.10.2020

(C.P. Vinod Kumar)

Appreciation

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE & BIO-DIVERSITY CONSERVATION) CUM-CHIEF WILDLIFE WARDEN CHHATTISGARH
Aranaya Bhawan, First Floor (FR) Sector 19, North Block, Capital Complex Atal Nagar, Nava Raipur
✉ cwlwcg@gmail.com (☎0771-2512880, 🖷 0771-2512881)

No./WL /Coord./.Q1..... Nava Raipur, Dated :..04/06/2021

Prof. Gajanan Dadaraoji Muratkar delivered a virtual lecture captioned *"Grassland management Techniques for the Protected Areas of Chhattisgarh"* on *4th June 2021* to the Officers and field staff working in the Protected Areas of Chhattisgarh.

The inputs in the session gave an insight into the timelines in which different activities from seed collection, treatment, pre-sowing and post sowing operations need to be carried out to develop grassland in order to increase the herbivores population. The department is thankful to him and looks forward to having many more such fruitful training sessions in the future also.

04/06/2021.

(P.V.NARSINGA RAO)
Principal Chief Conservator of Forest (Wildlife) and
Chief Wildlife Warden, Chhattisgarh State

Appreciation

GOVERNMENT OF KARNATAKA

S. R. NATESHA, IFS.,
CONSERVATOR OF FORESTS &
FIELD DIRECTOR

FOREST DEPARTMENT

No. A4/BUD/CR 17/Grassland/2020-21 Date: 25-01-2021

To,
Dr. Gajanan Muratkar,
Grass Expert and
Head of the Department Environment Science,
Arts, Science and Commerce College,
Chikaldara, Amaravati,
Maharashtra - 444807

Sub: Appreciation of Services rendered in Grassland Management in Bandipur Tiger Reserve, Karnataka – reg.

--*-*

This is with great pleasure that, I acknowledge and immensely appreciate your technical guidance for the development of grasslands in Bandipur Tiger Reserve and the contribution towards the capacity building of our field and supervisory staff.

Your recent visit on 26th December 2020 to Bandipur and your inputs given in the workshop with the management of Bandipur Tiger Reserve have considerably added to our understanding of the improvement and management of grassland. I hope that in future also you will lend us your tremendous support for the cause of conservation of grassland in Bandipur Tiger Reserve.

(S. R. Natesha, IFS.,)
Conservator of Forests & Field Director,
Project Tiger, Bandipur

Project Tiger, Bandipur, Gundlupet Taluk, Chamarajanagar District, Karnataka -571126
Ph: 08229-236043/60 |E-mail: directorbtrtr@gmail.com | Web: www.bandipurtigerreserve.in

Appreciation

P.V. RAJA RAO, IFS
Director /CCF &
Secretary, CEFNARM

Telangana State Forest Academy
Government of Telangana,
Dulapally, Hyderabad – 500 100
Land Line (O) : **040 – 29 70 48 96**
Mob : + **91 94 40 81 01 66**
e-mail : **tsfa.hyd@gmail.com**
email: **peshi.tsfa@gmail.com**

D.O.Lr.No: 729/2021/E2, Dt 19.07.2021

Dear Dr. Gajanan Murathkar garu

Sub: 7th batch FRO ITP – West Central India Study Tour - Appreciation of Services rendered in Grassland Management as a part of Virtual Study Tour - Reg.

***

This is with great pleasure that, I acknowledge and immensely appreciate your technical guidance for the development of grasslands in protected areas towards the capacity building of 7th batch Forest Range Officer trainees.

On 29, July, 2021 as a part of Virtual tour on Grassland management, your inputs on Virtual mode added to our Forest Range Officer trainees understanding and updates knowledge on improvement of Grasslands. I hope that in future also you will extend your unstinted support for the cause of conservation of Grasslands.

With Warm regards, Sab,

19/7/2021

(Sri P.V. Raja Rao, IFS.,)
Director /CCF

To

Dr. Gajanan Murathkar,
Grass Expert and
Head of the Department Environment Science,
Arts, Science and Commerce College,
Chikaldara, Amaravati,
Maharashtra - 444807

Appreciation

Sri A.K. SINHA, IFS.,
Chief Conservator of Forests /
Field Director,
Amrabad Tiger Reserve,
Achampet.

Field Director,
Amrabad Tiger Reserve,
Forest Complex,
Achampet - 509375
Cell : 9440810115
E-Mail : atrcircle@gmail.com

Ref No 711/2020/PT4 Dated 28/01/2021

To
Dr. Gajanan Muratkar,
Grass Expert and
Head of the Department Environment Science,
Arts, Science and Commerce College,
Chikaldara, Amaravati,
Maharashtra – 444807

Sub:- Appreciation of Services rendered in Grassland Management in Amrabad Tiger Reserve, Achampet – Reg.,

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This is with great pleasure that, I acknowledge and immensely appreciate your technical guidance for the Development of Grasslands in Amrabad Tiger Reserve and the contribution towards the capacity building of our field and supervisory staff.

Your recent visit on 27th and 28th January 2021 to Amrabad Tiger Reserve and your inputs given in the workshop with the management of Amrabad Tiger Reserve have considerably added to our understanding of the improvement and management of grassland. I hope that in future also you will lend us your tremendous support for the cause of conservation of grassland in Amrabad Tiger Reserve, Achampet.

(A.K. Sinha, IFS.,)
Addl. Prl. CCF /Field Director,
Amrabad Tiger Reserve,
Achampet.

Appreciation

Smt. Sunita M. Bhagwat, IFS.,
Chief Conservator of Forests / CF
Rangareddy Circle, Rangareddy.

Room No. 232, 2nd Floor,
Aranya Bhavan, Saifabad,
Hyderabad – 500004.
Mobile: 9440815594
Office: 040 – 23232891.

No. Appreciation/Grassland/2021/M2 *Date: 29-01-2021*

To,
Dr. Gajanan Muratkar,
Grass Expert and
Head of the Department Environment Science,
Arts, Science and Commerce College, Chikaldara,
Amaravati, Maharashtra - 444807

Sub: Appreciation of Services rendered in ***"Management & Ecological Restoration of Grassland with Bio-mass Management"*** atMahavir HarinaVanashtali National Park, Hayathnagar Range, Shamshabad Division, Rangareddy District, Rangareddy Circle - reg.

-x-x-x-

This is with great pleasure that, I acknowledge and immensely appreciate your technical guidance & expertise for the development of grasslands in Rangareddy Circle and the contribution towards the capacity building& field demonstrationto our Forest Front Line staff &Field Officers.

Your visit on 29th January 2021, to Mahavir HarinaVanasthali National Park, Hayathnagar Range of Shamshabad Division, Rangareddy District and your valuable inputs provided in *the"Management & Ecological Restoration of Grassland with Bio-mass Management"* Workshop at Mahavir HarinaVanasthali National Parkhave enriched and considerably enhanced to our understanding of improvement, restoration and management of Grassland with respect to Bio-mass management.

I thank you for your support and expertise imparted to our Officers & staff and expect the same co-operation in future also towards the cause of conservation of grasslands in Rangareddy Circle.

With Best wishes,

29/01/2021

(Smt. Sunita M. Bhagwat, IFS.,)

Appreciation

महाराष्ट्र शासन
वन विभाग

वनसंरक्षक तथा क्षेत्र संचालक, ताडोबा-अंधारी व्याघ्र प्रकल्प, चंद्रपूर यांचे कार्यालय

दुरध्वनी क्रमांक (07172) 251414
ई-मेल ccffdtadoba2@mahaforest.gov.in

मुल रोड, चंद्रपुर-442401

Desk No-4/Steno/20-21/1733

Chandrapur, Date : **20/10/2020**

Sir,

Subject :- Letter of appreciation

On behalf of Tadoba-Andhari Tiger Reserve, Chandrapur, I place on record our sincere appreciation towards Prof. G. D. Muratkar, for his invaluable contribution towards improvement of grassland management practices in Tadoba-Andhari Tiger Reserve. He has conducted field visits and counducted on field training and workshops involving Forest officials from the cadre of Forest Beat Guards to Field Director on the grassland management, Wild legume identification, grass seed collection and weed eradication. This has resulted in visible change in different grasslands spread over this Tiger Reserve and we express our gratitude and acknowledge the services rendered by him, and hope for his continuing technical support and guidance.

(Dr. Jitendra S. Ramgaokar, IFS)
Conservator of Forests & Field Director,
Tadoba-Andhari Tiger Reserve, Chandrapur

To,
The Principal,
Arts Science and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State-444 807

News Paper Cuttings

लोकमत

मेळघाटच्या 'ग्रास मॅन'ने १२ राज्यातील ३० व्याघ्र प्रकल्पात फुलविले कुरण

आंतरराष्ट्रीय व्याघ्र दिन : 'गवत असेल तरच वाघ वाचेल'ची संकल्पना

स्पेशल रिपोर्ट

नरेंद्र जावरे
लोकमत न्यूज नेटवर्क

चिखलदरा (अमरावती) : जंगल असेल तर वाघ दिसेल, वाघासाठी आवश्यक असलेले तृणभक्षी प्राणी आणि त्या प्राण्यांसाठी अति आवश्यक असलेले गवती कुरण अशा या अन्नसाखळीला तयार करण्यासाठी चिखलदरा येथील एका महाविद्यालयाच्या प्राध्यापकाने एक दोन नव्हे, तब्बल देशातील १२ राज्यातील ३० पेक्षा अधिक व्याघ्र प्रकल्पात तृणभक्षी प्राण्यांसाठी कुरणक्षेत्र तयार केले आहे. त्यामुळे पर्यावरणासह व्याघ्र संवर्धनात मोठी मदत झाली आहे.

चिखलदरा येथील कला, वाणिज्य महाविद्यालयात पर्यावरणशास्त्राचे विभागप्रमुख प्रा. गजानन मुरतकर असे या प्राध्यापकाचे नाव आहे. गवती कुरणामुळे जमिनीची धूप, तापमान थांबण्यासह पाण्याचा निचरा, कीटक, सरपटणाऱ्या प्राण्यांना नैसर्गिकरीत्या आश्रयस्थान, तृणभक्षी प्राण्यांना आवडते खाद्य व वाघ, बिबट्यासारख्या मांसभक्षी प्राण्यांना जंगलातच शिकार मिळत असल्याने शहरात जाऊन मानव-वन्यजीव संघर्ष थांबण्यास मदत झाली आहे.

व्याघ्र प्रकल्पात झालेले कार्य दाखविताना प्रा. गजानन मुरतकर.

तृणभक्षी प्राण्यांत गवताच्या आवडीनिवडी

- मानवांमध्ये जेवणाच्या आवडीनिवडी आहेत त्याचप्रमाणे चितळ, गवा, सांबर, अशा विविध तृणभक्षी प्राण्यांच्या आवडीनिवडी आहेत, काहींना मुलायम व कडक गवत आवडते. त्यानुसार चितळ मार्दल गवत हे रसगुल्लाप्रमाणे आवडते, तर गवा कुसळी व गोंधळी, सांबर गवत कमी व झाडांची पाने, फुले, फळे जास्त खाती. तृणभक्षी प्राण्यासाठी दुर्वा, पवन्या, रानतूर, रानमूग, रानसोयाबीन, बांबू, अशा विविध प्रजातींचे गवत आहे.

या राज्यात गवती कुरण

- मध्यप्रदेश : कान्हा, सातपुडा, पन्ना, पेंच, बांधवगड.
- महाराष्ट्र : मेळघाट, सह्याद्री, पेंच, ताडोबा, नवेगाव, टिपेश्वर, नानज, भीमाशंकर, रहेकुरी.
- छत्तीसगड : अंचानकमार व इतर ४ अभयारण्यात.
- राजस्थान : रणथंबोर, मुकुंद-राहिल्स.
- कर्नाटक : बंदीपूर नागरहोले काली भद्रा बीआरटी.
- तामिळनाडू : के एम टी आर.
- ओडिशा : सिमलीपाल सातखोशिया.
- तेलंगणा : कवल अमराबाद.
- बिहार : वाल्मीकी टायगर रिझर्व्ह.
- उत्तराखंड : जिम कार्बेट आदी.

एकंदर मुंगी ते हत्तीपर्यंत गवत अन्नसाखळीचा दुवा ठरले आहे. मेळघाट व्याघ्र प्रकल्पात इतर व्याघ्र प्रकल्पांपेक्षा ११६ पेक्षा अधिक गवताच्या प्रजाती आहेत. ताडोबात केवळ बांबू असल्याने मेळघाटच्या सांभरपेक्षा तेथील तृणभक्षी प्राणी कमी वजनाचा असल्याचे निष्कर्ष पुढे आल्याचे मुरतकर यांनी सांगितले.

Nagpur Main
Page No. 2 Jul 29, 2021
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लोकमत

मेळघाटच्या 'ग्रास मॅन'ने १२ राज्यातील ३० व्याघ्र प्रकल्पात फुलविले कुरण

आंतरराष्ट्रीय व्याघ्र दिन : 'गवत असेल तरच वाघ वाचेल'ची संकल्पना

नरेंद्र जावरे
लोकमत न्यूज नेटवर्क

चिखलदरा (अमरावती) : जंगल असेल तर वाघ दिसेल, वाघासाठी आवश्यक असलेले तृणभक्षी प्राणी आणि त्या प्राण्यांसाठी अति आवश्यक असलेले गवती कुरण अशा या अन्नसाखळीला तयार करण्यासाठी चिखलदरा येथील एका महाविद्यालयाच्या प्राध्यापकाने एक दोन नव्हे, तब्बल देशातील १२ राज्यातील ३० पेक्षा अधिक व्याघ्र प्रकल्पात तृणभक्षी प्राण्यांसाठी कुरणक्षेत्र तयार केले आहे. त्यामुळे पर्यावरणासह व्याघ्र संवर्धनात मोठी मदत झाली आहे.

चिखलदरा येथील कला, वाणिज्य महाविद्यालयात पर्यावरणशास्त्राचे विभागप्रमुख प्रा. गजानन मुरतकर असे या प्राध्यापकाचे नाव आहे. गवती कुरणामुळे जमिनीची धूप, तापमान थांबण्यासह पाण्याचा निचरा कीटक, सरपटणाऱ्या प्राण्यांना नैसर्गिकरीत्या आश्रयस्थान, तृणभक्षी प्राण्यांना आवडते खाद्य व वाघ बिबट्यासारख्या मांसभक्षी प्राण्यांना जंगलातच शिकार मिळत असल्याने शहरात जाऊन मानव-वन्यजीव संघर्ष थांबण्यास मदत झाली आहे. एकंदर मुंगी ते हत्तीपर्यंत गवत अन्नसाखळीचा दुवा ठरले आहे. मेळघाट व्याघ्र प्रकल्पात इतर व्याघ्र प्रकल्पापेक्षा ११६ पेक्षा अधिक गवताच्या प्रजाती आहेत. ताडोबात केवळ बांबू असल्याने मेळघाटच्या सांभरपेक्षा तेथील तृणभक्षी प्राणी कमी वजनाचा असल्याचे निष्कर्ष पुढे आल्याचे मुरतकर यांनी सांगितले.

तृणभक्षी प्राण्यांत गवताच्या आवडीनिवडी

मानवांमध्ये जेवणाच्या आवडीनिवडी आहे त्याचप्रमाणे चितळ, गवा, सांबर, अशा विविध तृणभक्षी प्राण्यांच्या आवडीनिवडी आहेत, काहींना मुलायम व कडक गवत आवडते. त्यानुसार चितळ मार्दल गवत हे रसगुल्लाप्रमाणे आवडते, तर गवा कुसळी व गोंधळी, सांबर गवत कमी व झाडांची पाने फुले फळे जास्त खाती, तृणभक्षी प्राणी दूर्वा, पवन्या, रानतूर, रानमूग, रानसोयाबीन, बांबू, अशा विविध प्रजातीचे गवत आहेत.

व्याघ्र प्रकल्पात झालेले कार्य दाखविताना प्रा. गजानन मुरतकर

या राज्यात गवतीकुरण

मध्यप्रदेश : कान्हा, सातपुडा, पन्ना, पेंच, बांधवगड, महाराष्ट्र : मेळघाट, सह्याद्री, पेंच, ताडोबा, नवेगाव, टिपेश्वर, नानज, भीमाशंकर, रहेकुरी, छत्तीसगड : अंचानकमार व इतर ४ अभयारण्यात, राजस्थान : रणथंबोर, मुकुंदराहिल्स, कर्नाटक : बंदीपूर नागरहोले काली भद्रा बीआरटी. तामिळनाडू : के एम टी आर, ओरिसा : सिमलीपाल सातखोशिया, तेलंगणा कवल अमराबाद, बिहार वाल्मिकी टायगर रिझर्व, उत्तराखंड जिमकार्बेट आदी १२ राज्यापेक्षाआ आधिक ठिकाणी त्यांनी गवती कुरण तयार केले आहेत.

New Delhi
Page No. 4 Jul 29, 2021
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एमपी का ग्रास लैंड अफ्रीकन चीतों की तैयारियों के कारण सुर्खियों में आए कूनो अभ्यारण्य में कई विशेषताएं

वन विहार, कान्हा और सतपुड़ा रिजर्व में लगेगी कूनो की 'रसगुल्ला घास'

वीरेंद्र पंवार
ग्वालियर

अफ्रीका के चीतों की आमद से पहले की जा रही तैयारियों को लेकर सुर्खियों में आए कूनो-पालपुर अभ्यारण्य की घास की भी प्रदेशभर में डिमांड है। भोपाल के वन विहार, कान्हा और सतपुड़ा के टाइगर रिजर्व ने यहां की मारवेल घास की मांग की है। दरअसल, 748.8 किलोमीटर में फैले कूनो अभ्यारण्य में करीब 40 फीसदी क्षेत्र में घास के मैदान हैं। यहां 86 तरह की घास होती है। इनमें मारवेल घास सबसे खास है। इसे विशेष कार्यक्रम चलाकर पिछले 10 सालों में बढ़ाया गया है। इस घास को खाने से चीतल, सांभर व दूसरे शाकाहारी वन्यजीवों की संख्या कई गुना तक बढ़ी है इसलिए अब दूसरे टाइगर रिजर्व भी वन्यजीवों की तादात बढ़ाने के लिए इस घास को अपने यहां लगाएंगे।

प्रोएक्टो फ्रेंक वर्मा के मुताबिक, बारिश के बाद इस घास के बीज वन विहार व अन्य नेशनल पार्क में भेजे जाएंगे। इस घास को महाराष्ट्र के घास विशेषज्ञ प्रो. जीडी मुरतकर की देखरेख में पिछले कुछ सालों में बढ़ाया गया है। प्रदेश में कूनो के घास के मैदान सबसे अच्छे हैं। इस घास की वजह से ही कूनो पालपुर अभ्यारण्य में शाकाहारी वन्यजीवों की तादात तेजी से बढ़ रही है।

ग्वालियर से 150 किलोमीटर दूर स्थित कूनो पालपुर अभ्यारण्य में 'मारवेल घास' के मैदान, इसी रसगुल्ला घास भी कहा जाता है।

86 प्रजातियों की घास कूनो पालपुर अभ्यारण्य में पाई जाती है

- 42 प्रजाति की घास वन्यजीव खाते हैं, शेष अप्राप्य होती हैं
- कूनो नदी की घास वन्यजीवों के लिए दवा का काम करती है

खासियत.. प्रोटीन, शुगर के साथ फाइबर-कार्बो हाइड्रेट ज्यादा

कूनो में मारवेल घास सबसे अधिक पाई जाती है। इसकी छोटी, बड़ी, मध्यम और जमीन से चिपककर रहने वाली प्रजातियां होती हैं। सबसे अधिक छोटी और बड़ी मारवेल घास यहां लगाई गई है। इसमें प्रोटीन, शुगर, फाइबर व कार्बो हाइड्रेट होता है। इसमें पानी की मात्रा भी ज्यादा होती है।

भोपाल के वन विहार सहित तीन जगह से घास की डिमांड आई है

"कूनो की मारवेल घास को खाने से शाकाहारी वन्यजीवों की संख्या बढ़ी है। इस घास के लिए वन विहार भोपाल से पत्र मिला है। कान्हा और सतपुड़ा टाइगर रिजर्व ने भी घास की मांग की है। जल्द बीज इन स्थानों पर भेजेंगे।
-पीके वर्मा, डीएफओ, कूनो सेंक्चुरी

2011 से की थी घास को बढ़ावा देने की शुरुआत

"कूनो सेंक्चुरी में सबसे उपयुक्त घास के मैदान हैं। यहां मिलने वाली मारवेल घास को खाकर चीतल, सांभर व दूसरे शाकाहारी वन्यजीवों की संख्या तेजी से बढ़ी है इसलिए इस घास की डिमांड अधिक है। 2011 से 2014 तक मैं नेतृत्व में इस घास को बढ़ावा देने के लिए नर्सरी बनाकर घास के मैदानों को बढ़ाया था। अब ये घास कूनो की पहचान बन गई है। इसे हम रसगुल्ला घास कहते हैं। **- प्रो. 'जीडी मुरतकर,** घास विशेषज्ञ, भोपाल

Kawal
Grasslands Management

Sahyandri
Grasslands Management

Tadoba
Grasslands Management

Satpuda
Grasslands Management

Bandipur
Grasslands Management

Kanha
Grasslands Management

Panna
Grasslands Management

Amrabad
Grasslands Management

Pench
Grasslands Management

Extension Activity Report

"Training to the Frontline Staff of Forest Department for Grasslands Management in Protected Areas"

Training by

Prof. G. D. Muratkar

Assist. Prof. & Head Dept. of Environmental Science

Arts ,Science &Commerce College Chikhaldara

Dist. Amravati 444807 M. S.

Duration of Activity

2018-19 & 2019-20

Department of Environmental Science

Arts , Science & Comm. College Chikhaldara

Dist. Amravati 444807

Extension Activity Report

Department of Environmental Science

Academic Year 2019-20

Format for presentation of best Practices

1. Title

Training to the frontline forest staff for grasslands Management in Protected Areas of Telangana State.

2. Goal

To develop grazing habitat for herbivores in Protected Areas specially in Tiger Reserve , Sanctuary and National park**.**

Participants in the field workshop

DCF, Field Director, RFO, Section officer, Bit guard of tiger reserve .

1. Kawal Tiger Reserve
2. Amrabad Tiger Reserve and Vansthali National Park Hydrabad.

Duration of Activity (Workshop) : 28th October to 2nd November 2019

Concept

To know the soil characters, profile for grassland development in natural pastures, degraded areas of forest and lantana removed areas for restoration of grasslands. To manage the grazing, browsing, breeding, nesting habitats.

To train the frontline staff for

- Grasses, weeds and wild leguminous plants identification from forest areas.
- Enrichment of grasslands
- Eradication of weeds from grasses for habitat improvement
- Brushwood management
- Geo mapping of grasslands
- Restoration of grasslands
- Grasses seeds collection, storage and enrichment.

The Context

The Protected Areas includes Tiger Reserves, National Parks, Wildlife Sanctuaries, the wildlife like Herbivores, Omnivores, Carnivores habited in the protected areas. The grasses are the producers, soil binders , provides chemical energy to the wildlife in the form of fodder species. The protected areas forest are with 2-4.5 % grasses naturally it should be 6.5 %- 7.9%. Now recently natural grasslands and relocated areas of the Protected Areas are developing in to good grasslands for the herbivores.

Grasslands are the green ground cover of protected areas in forest. The grasses are useful for grazing habitat of wildlife (Herbivores). The threats to the grasslands are soil degradation, loss of soil moisture, leach out of nutrients of the soil, forests fires, weed infestation, woody species encroachment, change in grasslands composition, exotic species and decrease in nutritive value of the fodder grasses.

The faculty member of the department of the college has the good expertise in the grasses, weeds and forests flora identification and their nutritive values.

The grassland management practices includes

1. To give the field training to the forests field staff in the natural grasslands and relocated areas of the Protected Areas in each season of the year.
2. To know the exact area of grassland year wise by demarcation of grassland area by GPS.
3. Grasses identification training to field staff by local names and scientific names.
4. Weeds identification with local names and their flowering season.
5. Browsing species identification with local names.
6. Field training to collect the grasses seeds and wild legumes seeds.
7. Weed eradication programme two times in a year
8. Grasslands enrichment by seed broadcasting in May - June season.
9. Grasses biomass management practices in mosaic pattern.
10. Wild fruit trees identification and addition in relocated areas.
11. Complete training programmes are organized by the CCF & Field Director of the respective Tiger Reserves in each season.

The practices in the field

Kawal Tiger Reserve, Telangana State

Ecological Impact Assessment of Relocated villages of Akot Wildlife Division Melghat Tiger Reserve , Amravati

Interim Progress Report

Project Name	Ecological Impact Assessment of Relocated villages of Akot Wildlife Division Melghat Tiger Reserve , Amravati
Project report compiled from	Prof. G. D. Muratkar (Grass Expert) Head Department of Environmental Science Arts , Science & Commerce College , Chikhaldara Dist. Amravati
Contributors	Mr. Chetan R. Joshhi , Mr. T. R. Akhande
Reporting period	**July 2019 to October 2020**
Summery	The relocated villages of Melghat Tiger Reserve are Amona , Barukheda , Bori,Churni , Dhargad , Gullarghat ,Kund , Nagartash , Somthana and Vairat. All these villages are relocated from the core area of MTR from 2002 to 2014. The main objective of the relocation was to develops and extend the good grasslands , grazing , browsing , breeding , nesting and hidden habitats in the large area of MTR. The baseline data before relocation was collected time to time by me and my field team. After relocation of villages what ecological ,phyto sociological and physical changes are occurred are to be studied in the form of Ecological Assessment of the grasslands. The forests type of the Melghat is Tropical dry deciduous type with ***Tectonagrandis*** L. (Teak) as a dominant tree vegetation.The grasslands of MTR are mostly heterogeneous with annual , palatable grasses. The dominant useful Dicanthiumannulatum ,Dicanthiumcaricosum fodder grasses are Apludamutica , Brachiariamutica , Heteropogoncontortus ,

<table>
<tr><td></td><td>Themedaquadrivalvis . The wild leguminous plants are distributed in the grasslands of MTR. The grasses maintain the productivity of the grassland ecosystem and play a vital role in grazing food chain. The grasslands maintain the prey base for the Carnivores and useful for the flow of kinetic energy in the ecosystem.</td></tr>
<tr><td>Activities and progress</td><td>Ecological and taxonomical Survey of the grasslands
Soil pH analysis of each grassland.
To lay down the ecological quadrates in grasslands.
Identification and enumeration of grasses.
Identification and enumeration of wild leguminous plants.
Observations of grasses associates.
To study the % of Perennial and annual Palatable grasses.
To study the % of Perennial and annual non palatable grasses.
Weeds Species identification.</td></tr>
<tr><td>Outputs of the survey and case study.</td><td>The intensive survey was carried out in the Monsoon season as a first season of the year.
The soil ecology was determined :
<table>
<tr><td>Relocated Village</td><td>Soil PH</td><td>Soil colour</td><td>Soil moisture</td></tr>
<tr><td>Barukheda</td><td>7.48</td><td>Brown - white</td><td>1.786 gm / kg</td></tr>
<tr><td>Nagartash</td><td>7.15</td><td>Black - Brown</td><td>1,981 gm /kg</td></tr>
<tr><td>Amona</td><td>7.67</td><td>Murmi - Brown</td><td>1.47 gm</td></tr>
</table></td></tr>
</table>

Gullarghat Dhargad	7.7 to 8.2	Brown - Black - Red	1.2 to 1,6 gm
Bori	7.8	Black - brown and murmi	1,95gm / kg
Somthana	7.46	Red murmi and brown	1.85 gm
Churni	7.32	Murmi red	1.64gm
Vairat	7.41	Red Murmi	1.58 gm
Kund	7.45	Murmi red	1.62 gm

- Rainfall varries from 850 mm t0 1900 mm
- Temperature Ranges from 6.5 to 48 degree celcious
- Humidity is variable from grasslands to grasslands 66 to 84 %
- The dominant perennial palatable grasses are : Dicanthiumannulatum. Dicanthiumcaricosum , Dicanthiumpersutum, DicanthiumStrictum, Heteropogoncontortus, Cynodondactylon, Cynodonbarberi, Iselimalaxum, Paspaladiumflavedium.
- The dominant annual palatable grasses are : Themedaquadrivalvis, Setariapumilla, Setaria intermedia, Brachiariamutica, Echinochloacolonum,

<table>
<tr><td></td><td>Dinebraretroflexa , Digitariaabludens, Urochloamutica, Panicumtyhoides, Chloris virgata, Chloris barbata.
• Wild leguminous plants : Wild mungo, tur, soyabean, udid , methi, matki, etc.
• Weeds : The dominant weeds are Rantulas, Gokharu, Aghada, Gajar grass, Kena, Reshimkata, Kombada or kardu, Ageratum conyzoides, Tarota, Tridaxprocumbens.
• Wild fruit trees : Moha, Bor, Tendu, Awala, Behada, Tiwas, Umber, Wad, Bel, Amaltash, Bahuniaspp all etc.</td></tr>
<tr><td>Progress towards the Grasslands Management practices.</td><td>Grassland Management practices from last 5 years shows the following positive ecological successions.
1. Heterogeneous grasslands.
2. Marvel grass along the boundaries of the cultivated fields and in open grasslands.
3. Marvel grass replaces most of the weeds.
4. Species diversity index increases.
5. Association of the grasses with wild legumes.
6. Soil texture changes.
7. Intermediate grasslands formation.
8. Reduction in the % of unwanted weeds plants.</td></tr>
<tr><td>Evaluation report.</td><td>
<table>
<tr><td>Relocated Site</td><td>Grasses association</td><td>Wild legumes %</td><td>Soil texture</td><td>Weeds %</td></tr>
<tr><td>Amona</td><td>Good with more annual grasses, Tikhadi grass dominent.</td><td>100 %</td><td>Murmi, red coloured</td><td>Moderate unc control.</td></tr>
<tr><td>Barukheda</td><td>Good grassland</td><td>Wild tur,</td><td>Murmi, red,</td><td>Under contro</td></tr>
</table>
</td></tr>
</table>

		with heterogeneous association. 45 % perennial grasses & 50 % annual grasses.	soyabeand ominant	black	
	Bori	Taller grassland with Heteropogon, Themeda , Apluda with species diversity. Grassland at the climax stage.	Very less	Murmired	Under contro but threat of Lantana in future.
	Churni	Mixed type of grassland.	Very less	Murmi red soil	Very high % weeds
	Dhargad	Mixed types of grasses.	Moderate	Red - murmi soil	Under contro but village ar with more % weeds.
	Gullarghat	Very good grassland only threat of wild Jowar in future.	Moderate	Red - Murmi soil	Weeds controlled.
	Kelpani	Good grasses in black loamy soil. Good potential for the	Very less	Black and murmi soil	More weeds i new relocated area.

		heterogeneous grassland development due to soil texture diversity.			
	Kund	Taller grassland with Heteropogon as dominant grass.	60 %	MURMI RED	Under controlled.
	Nagartash	Mixed grassland.	35%	Red murmi	Controlled
	Vairat	Mixed grassland. more patches of Dicanthium along Anikets And in open areas.The taller perrenial grassland developed near the back side of temple in 36 hectares area.	10 %	Red murmi soil	Controlled ,weed eradication in progress and regular.

Grasslands Development & Management Plan For

Relocated sites of Protected Areas

Grasslands sites of the protected areas (Relocated areas) composed of natural grasses, weeds, small shrubs, woody climbers, parasites and wild leguminous plants. Such area soil is degraded by the grazing pressure of domestic cattle's and anthropogenic factors. The exotic weeds are invaded on large scale.

In protected areas the main objectives are :

- To manage the weed species in limited period.
- To know the natural grass flora distribution.
- To develop good heterogeneous grassland for herbivores.
- To reduce the woodland species.

Management Practices (Plan for the Development of grasslands)

- To plough the soil of relocated areas in summer or in pre-monsoon period.
- To increase the aeration of soil by ploughing.
- Ploughing useful for removal of weeds like Alternanthera, runners or prostrate plants.
- Collection and burning of weed species. (May
- Addition of Browsing bamboo species along the boundaries of village area. (June- July)
- Addition of wild fruit trees by grid line randomly. (July)
- Addition of annual / perennial palatable grasses in plough areas by seed broadcasting. (Duration : May – 25^{th} to 30^{th})
- Management of natural water bodies by de-siltation.
- Weed Eradication programme

  1) June – July for new weed comers.

  2) September – October : weed removal before flowering stages.

  3) December – January : removal of succulent weeds .
- Seed collection of wild legumes.
- Weed removal: for continuous three years in proper period which will be useful for reduction of weed species.
- Management of Cuscuta reflexa, Cucurbits form relocated sites in premonsoon period.

- Use of natural compost of the villagers in grasslands.
- On priority firstly: Manage the house places of the villages in which the weeds are on large percentage.
- Prepare the grass seed bank of two hectares by fence to develop the grass seed plot.
- After relocation: collect the grass seeds from the different locations in November – December, and broad cast the seeds in next pre monsoon period.

Grasslands Development & Management Plan For

Degraded grasslands in Protected Areas

Grasslands of protected areas naturally composed of good heterogeneous grasses like Themeda, Aluda, Heteropogon, Dicanthium, Eragrostis, Sprobolus, wild sorghum and some wild fruit trees, browsing species for the herbivores.

Reasons for the grassland degradation

- Loss of soil moisture.
- Loss of mineral nutrients.
- Low water holding soil capacity.
- Pressure of exotic weed species.
- Growth of woody hardy species.
- Biotic pressure.
- In proper management in puts.
- Management of grasslands in un proper manner.
- Ratio of grass species and woody species.

Management Protocol

- Manage the natural water bodies like lakes, ponds, by de-siltation, linkages.
- Soil moisture conservation practices in proper period.
- Reduction woodlands species under 20-30 cm.
- Broadcasting of perennial palatable grass in May 25^{th} 31^{st}. Seeds of grass species, like Dicanthium annualtum, Dicanthium caricosum, Themeda triandra, Themeda quadrivalvis, Panicum milliare, Setaria pumilla, S. intermedia, Apluda mutica.
- Addition of indeginious wild leguminous plants like wild moog, wild arhar, wild udid.
- Cutting of tall grasses twice in a year – November and January to maintain the grass biomass.
- Weed eradication programmes thrice in a year for continuous two to three years.
- To increase the % of perennial grasses by slips / tusks / seed broadcasting.
- Grass slips addition – June – july.

- Seed collection – November – December.
- Weed eradication _ Woody hardy species – June – July , Herbs weeds – in flowering stages or before seed formation
- Addition of browsing species like Bahunia, Helictoris, Bamboo along the boundries.
- Maintain eco friendly water holes.

Grasslands Development & Management Plan For

Natural Grasslands in Protected Areas

Natural grasslands : "Grasslands with indeginious grasses species in the form of natural mesarch succession in the form of annual , perennial , palatable , non palatable grasses and wild fruit trees , browsing shrubs , climbers , runners and aquatic , amhiterrestrial grasses are the natural grasslands".

Composition

- Natural grasses : Heteropogon contortus, Themeda triandra, Themeda quadrivalvis, Dicanthium caricosum, D. annulatum, D. faveolatum, D. tuberculatum, D. strictum, D. strictum, Setaria verticellata, S. intermedia, S. pumilla, Spodiopogon rhizophorus, Sorghum prupureum, S. deccanensis, Apluda mutica, Anthraxon lanceolatus, Rottbolia cochinchinensis , etc

Types of Natural grasslands

1) Taller grasslands

2) Intermediate grasslands

3) Smaller grasslands.

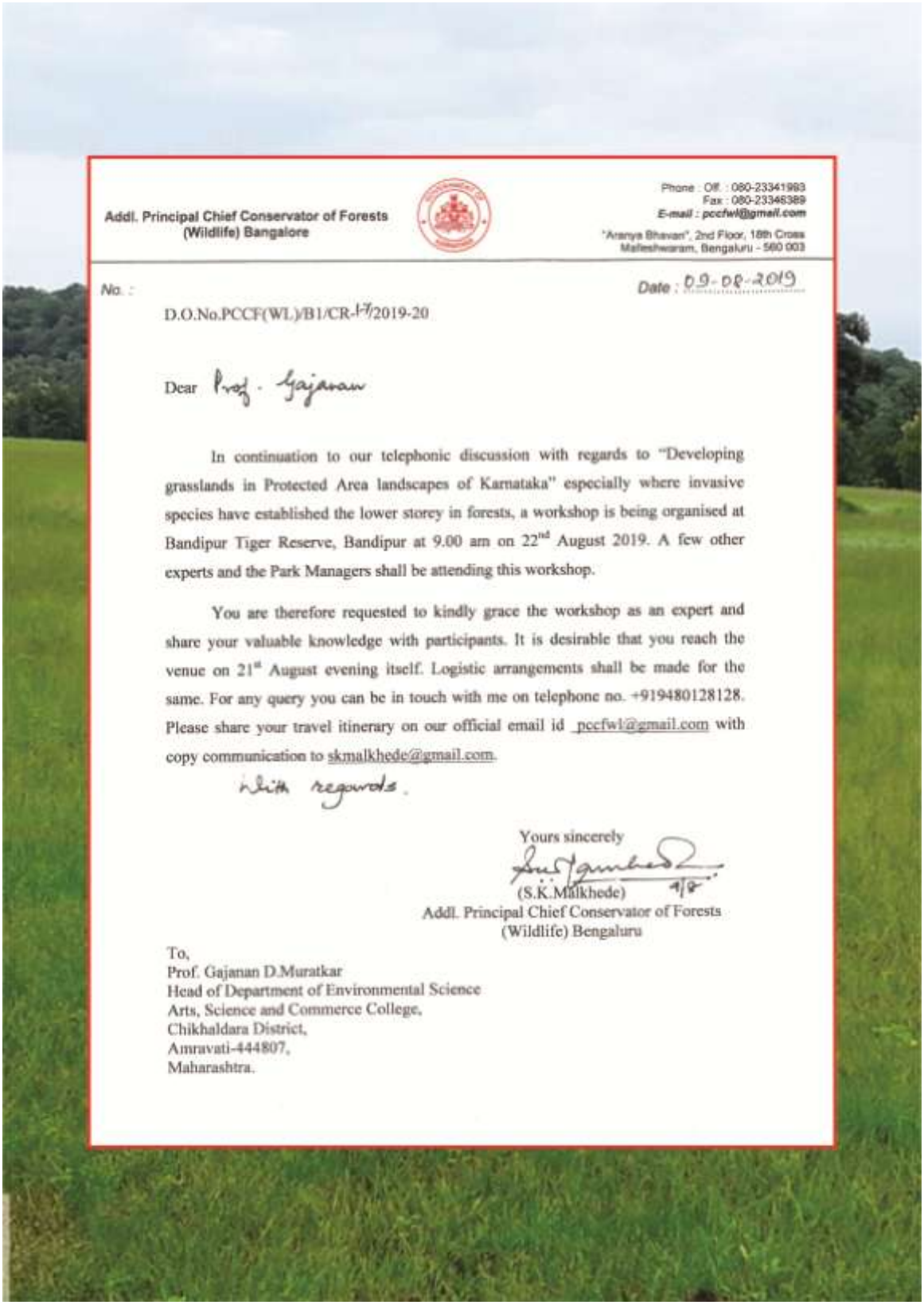
4) Wild legumes, Browsing plants , wild fruit trees.

Management Protocol

- To increase the % of perennial palatable grasses like
  1) Dicanthium caricosum
  2) D. annulatum
  3) Bothrichloa pertusa
  4) Themeda quadrivalvis
  5) Sacciolepis indica
  5) Elusine indica
  6) Heteropogon triticeous
  7) Cynodon dactylon
- Management of exotic invasive species like Pennesetium pedunculatum.
- Reduction of hard grasses like Aristida funiculata, A. reducta.
- To increase the % of wild legumes in grasses by seed collection and seed

broadcasting.

- Add perennial grasses near water bodies.
- To maintain grass biomass of perennial, tall grasses like Heteropogon, Dicanthium.
- Weed eradication programme in proper period.
- Addition of wild fruit trees.
- To maintain the browsing plants in natural grasslands.
- Grass seed bank.
- Manage parasitic plants in proper way.



Addl. Principal Chief Conservator of Forests
(Wildlife) Bangalore

Phone : Off. : 080-23341993
Fax : 080-23346389
E-mail : pccfwl@gmail.com
"Aranya Bhavan", 2nd Floor, 18th Cross
Malleshwaram, Bengaluru - 560 003

No. :

Date : 09-08-2019

D.O.No.PCCF(WL)/B1/CR-17/2019-20

Dear Prof. Gajanan

In continuation to our telephonic discussion with regards to "Developing grasslands in Protected Area landscapes of Karnataka" especially where invasive species have established the lower storey in forests, a workshop is being organised at Bandipur Tiger Reserve, Bandipur at 9.00 am on 22nd August 2019. A few other experts and the Park Managers shall be attending this workshop.

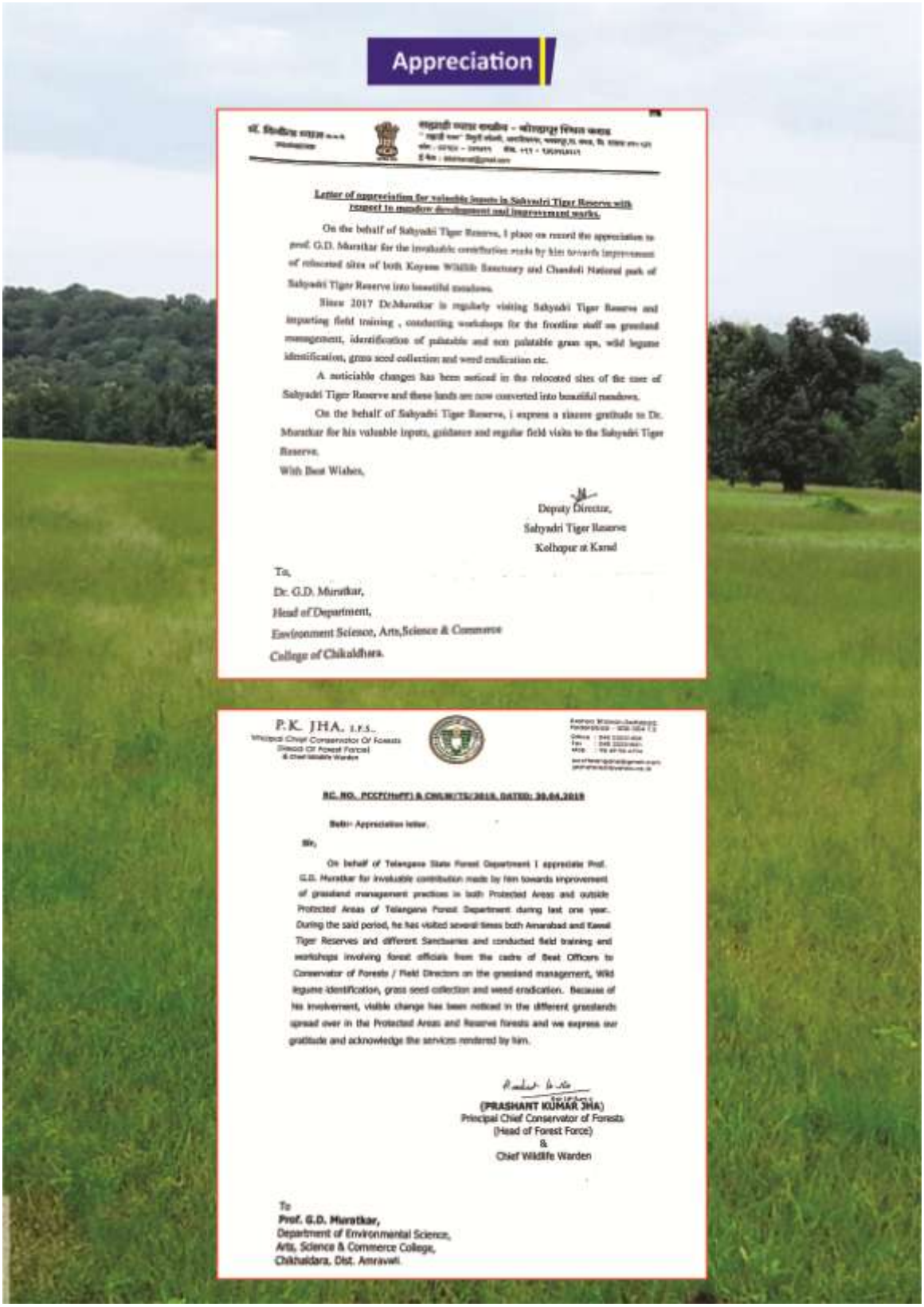
You are therefore requested to kindly grace the workshop as an expert and share your valuable knowledge with participants. It is desirable that you reach the venue on 21st August evening itself. Logistic arrangements shall be made for the same. For any query you can be in touch with me on telephone no. +919480128128. Please share your travel itinerary on our official email id pccfwl@gmail.com with copy communication to skmalkhede@gmail.com.

With regards.

Yours sincerely

(S.K.Malkhede)
Addl. Principal Chief Conservator of Forests
(Wildlife) Bengaluru

To,
Prof. Gajanan D.Muratkar
Head of Department of Environmental Science
Arts, Science and Commerce College,
Chikhaldara District,
Amravati-444807,
Maharashtra.



Appreciation

Letter of appreciation for valuable inputs in Sahyadri Tiger Reserve with respect to meadow development and improvement works.

On the behalf of Sahyadri Tiger Reserve, I place on record the appreciation to prof. G.D. Murathar for the invaluable contribution made by him towards improvement of relocated sites of both Koyana Wildlife Sanctuary and Chandoli National park of Sahyadri Tiger Reserve into beautiful meadows.

Since 2017 Dr.Murathar is regularly visiting Sahyadri Tiger Reserve and imparting field training , conducting workshops for the frontline staff on grassland management, identification of palatable and non palatable grass spp, wild legume identification, grass seed collection and weed eradication etc.

A noticiable changes has been noticed in the relocated sites of the core of Sahyadri Tiger Reserve and these lands are now converted into beautiful meadows.

On the behalf of Sahyadri Tiger Reserve, i express a sincere gratitude to Dr. Murathar for his valuable inputs, guidance and regular field visits to the Sahyadri Tiger Reserve.

With Best Wishes,

Deputy Director,
Sahyadri Tiger Reserve
Kolhapur at Karad

To,
Dr. G.D. Murathar,
Head of Department,
Environment Science, Arts,Science & Commerce
College of Chikaldhara.

P.K. JHA. I.F.S.,
Principal Chief Conservator Of Forests
Director Of Forest Force
& Chief Wildlife Warden

RC. NO. PCCF(HoFF) & CWLW/TS/2019, DATED: 30.04.2019

Sub:- Appreciation letter.

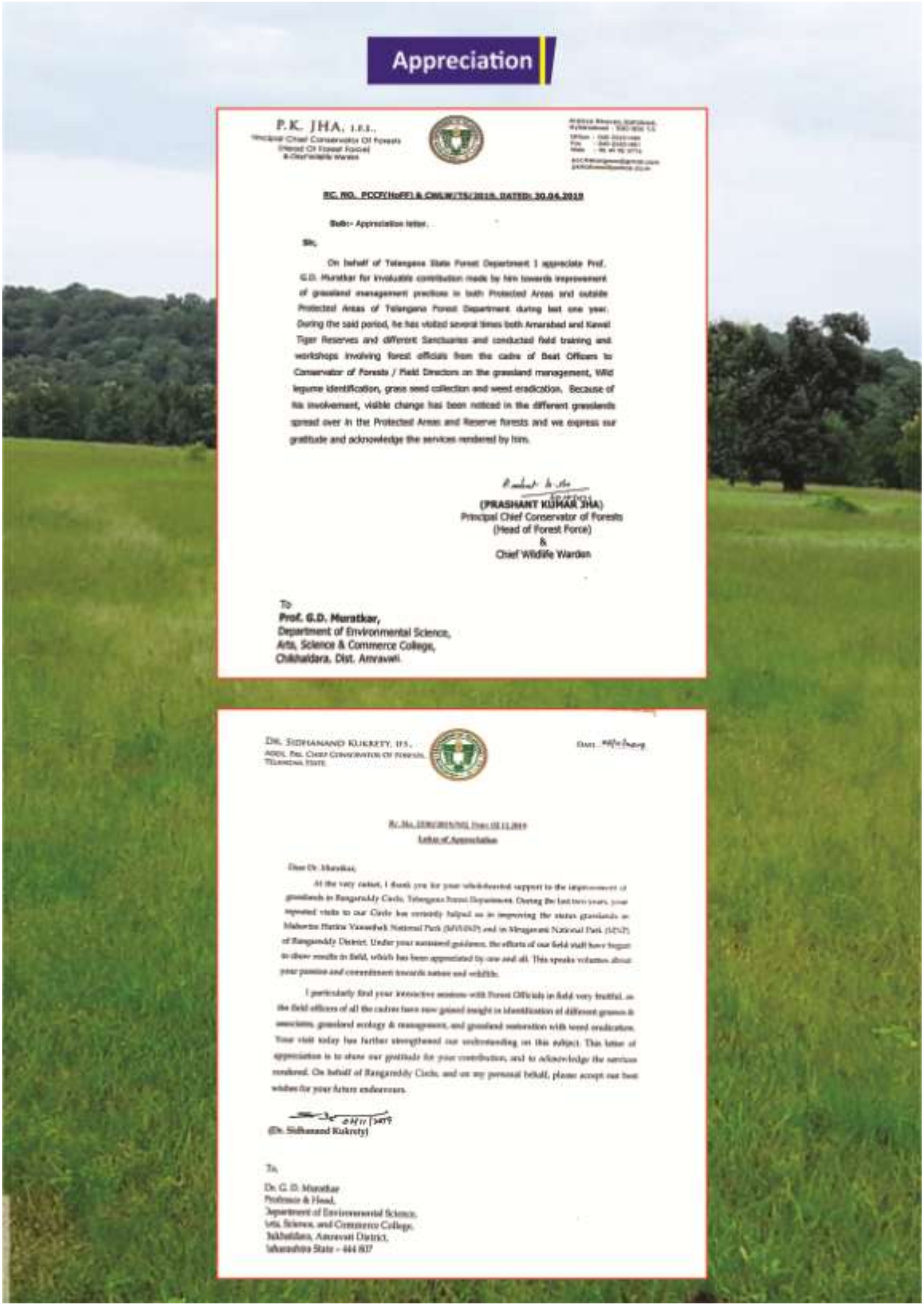
Sir,

On behalf of Telangana State Forest Department I appreciate Prof. G.D. Murathar for invaluable contribution made by him towards improvement of grassland management practices in both Protected Areas and outside Protected Areas of Telangana Forest Department during last one year. During the said period, he has visited several times both Amarabad and Kawal Tiger Reserves and different Sanctuaries and conducted field training and workshops involving forest officials from the cadre of Beat Officers to Conservator of Forests / Field Directors on the grassland management, Wild legume identification, grass seed collection and weed eradication. Because of his involvement, visible change has been noticed in the different grasslands spread over in the Protected Areas and Reserve forests and we express our gratitude and acknowledge the services rendered by him.

(PRASHANT KUMAR JHA)
Principal Chief Conservator of Forests
(Head of Forest Force)
&
Chief Wildlife Warden

To
Prof. G.D. Murathar,
Department of Environmental Science,
Arts, Science & Commerce College,
Chikhaldara, Dist. Amravati.

Appreciation



P.K. JHA, I.F.S.,
Principal Chief Conservator Of Forests
(Head Of Forest Force)
& Chief Wildlife Warden

[illegible]

RC. NO. PCCF(HoFF) & CWLW/TS/2019, DATED: 30.04.2019

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&
Chief Wildlife Warden

To
Prof. G.D. Muratkar,
Department of Environmental Science,
Arts, Science & Commerce College,
Chikhaldara, Dist. Amravati.

DR. SIDHANAND KUKRETY, IFS.,
ADDL. PRL. CHIEF CONSERVATOR OF FORESTS,
TELANGANA STATE

Date: [illegible]

Rc. No. [illegible]
Letter of Appreciation

Dear Dr. Muratkar,

At the very outset, I thank you for your wholehearted support to the improvement of grasslands in Rangareddy Circle, Telangana Forest Department. During the last two years, your repeated visits to our Circle has certainly helped us in improving the status grasslands in Mahavir Harina Vanasthali National Park (MHVNP) and in Mrugavani National Park (MNP) of Rangareddy District. Under your sustained guidance, the efforts of our field staff have begun to show results in field, which has been appreciated by one and all. This speaks volumes about your passion and commitment towards nature and wildlife.

I particularly find your interactive sessions with Forest Officials in field very fruitful, as the field officers of all the cadres have now gained insight in identification of different grasses & associates, grassland ecology & management, and grassland restoration with weed eradication. Your visit today has further strengthened our understanding on this subject. This letter of appreciation is to share our gratitude for your contribution, and to acknowledge the services rendered. On behalf of Rangareddy Circle, and on my personal behalf, please accept our best wishes for your future endeavours.

(Dr. Sidhanand Kukrety)

To,

Dr. G. D. Muratkar
Professor & Head,
Department of Environmental Science,
Arts, Science, and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State – 444 807

Appreciation

The Indian Science Congress Association, Kolkata, Sponsored

NATIONAL CONFERENCE ON

SCIENCE AND TECHNOLOGY : RURAL DEVELOPMENT

(Sustainable Development through Science and Technology)

November 27- 28, 2019

Hosted by

SHRI SHIVAJI EDUCATION SOCIETY AMRAVATI'S

SCIENCE COLLEGE, CONGRESS NAGAR,

Nagpur- 440012, (M.S.) INDIA.

Outstanding Contribution in Wildlife Conservation

We are pleased to present this award to

Dr. G. D. Muratkar

of

Sipna College, Chikhaldara

for Outstanding Contribution in the field of Science

At National Conference on Science and Technology : Rural Development

(NCSTRD-2019) held during November 27-28, 2019

at SSES Amt's Science College, Congress Nagar, Nagpur

r. A. D. Bobdey
Convenor
NCSTRD-2019

Dr. M. P. Dhore
Chairman, NCSTRD-2019
Principal, SSES Amt's Science College,
Congress Nagar, Nagpur

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మండల కేంద్రంలోని జిల్లా పరిషత్ ఉన్నత పాఠశాల కల్యాణం నిర్వహిస్తారు.

పకడ్బందీగా గడ్డిక్షేత్రాల నిర్వహణ

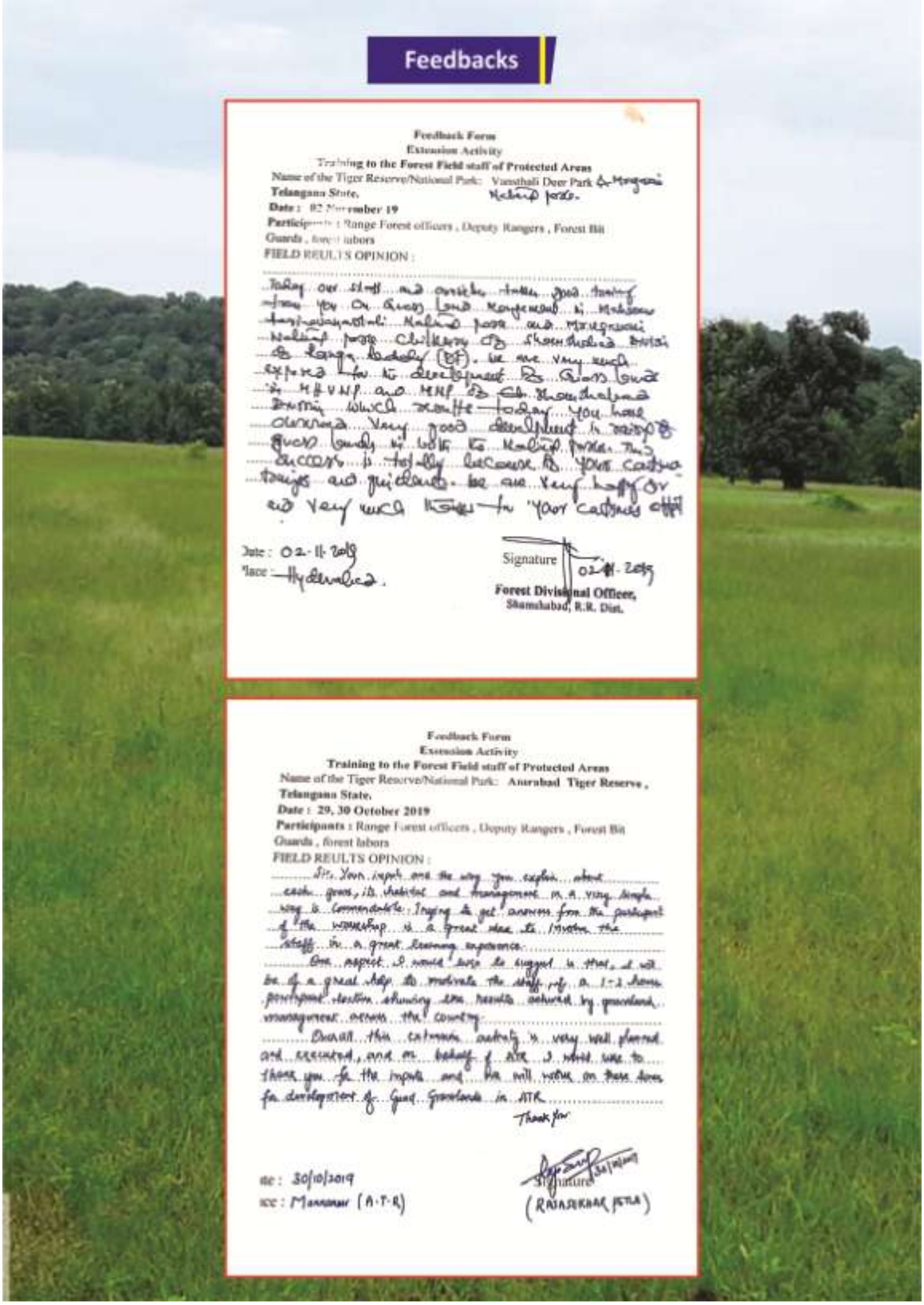
జన్నారం, న్యూస్‌టుడే : కవ్వాల్ పులుల సంరక్షణ కేంద్రంలో గడ్డి క్షేత్రాలను పకడ్బందీగా నిర్వహిస్తున్నామని జన్నారం ఎఫ్‌డీఓ మాధవరావు అన్నారు. శుక్రవారం ప్రత్యేకాధికారి డా.మురాద్యుర్ సమక్షంలో కవ్వాల్‌లో పెంచుతున్న గడ్డి క్షేత్రాలు, తీసుకుంటున్న జాగత్తలు గురించి ప్రొజెక్టర్ ద్వారా ఎఫ్‌డీఓ వివరించారు. పులికి ఆహారంగా ఉపయోగపడే శాకాహార జంతువులకు తగిన ఆహారాన్ని సమకూర్చే లక్ష్యంతోనే ఇక్కడ గడ్డిని పెంచుతున్నట్లుగా ఆయన చెప్పారు. కార్యక్రమంలో కవ్వాల్ పులుల సంరక్షణ కేంద్రం ఫీల్డ్ డైరెక్టర్ సీవీ వినోద్‌కుమార్, మంచిర్యాల, ఆదిలాబాద్, కుమురం భీం ఆసిఫాబాద్, నిర్మల్ జిల్లాల డీఎఫ్‌ఓలు శివానిదొగ్రే, డా.ప్రభాకర్, రంజిత్ నాయక్, ప్రసాద్, ఉమ్మడి ఆదిలాబాద్ జిల్లాలోని ఎఫ్‌డీఓలు, రేంజి, డిప్యూటీ రేంజి, సెక్షన్ అధికారులు పాల్గొన్నారు.

మాట్లాడుతున్న ఎఫ్‌డీఓ మాధవరావు

హాజరైన అటవీశాఖ అధికారులు

Date : 02/11/2019 EditionName : TELANGANA(NIRMAL) PageNo : 11

Feedbacks



Feedback Form
Extension Activity
Training to the Forest Field staff of Protected Areas

Name of the Tiger Reserve/National Park: Vanasthali Deer Park & Mrugavani National Park.
Telangana State.
Date : 02 November 19
Participants : Range Forest officers , Deputy Rangers , Forest Bit Guards , forest labors
FIELD REULTS OPINION :

Today our staff and ourselves taken good training from you on Grass Land Management in Mahavir Harinavanasthali National Park and Mrugavani National Park Chilkur of Shamshabad Division & Ranga Reddy (Dt). We are very much exposed for the development of Grass land in MHVNP and MNP of Shamshabad Division which results today. You have observed very good development in raising of grass lands in both the National Parks. This success is totally because of your cautious training and guidance. We are very happy for and very much thanks for your cautious effort

Date : 02-11-2019
Place : Hyderabad.

Signature 02-11-2019
Forest Divisional Officer,
Shamshabad, R.R. Dist.

Feedback Form
Extension Activity
Training to the Forest Field staff of Protected Areas

Name of the Tiger Reserve/National Park: **Amrabad Tiger Reserve , Telangana State.**
Date : 29, 30 October 2019
Participants : Range Forest officers , Deputy Rangers , Forest Bit Guards , forest labors
FIELD REULTS OPINION :

Sir, Your inputs and the way you explain about each grass, its habitat and management in a very simple way is commendable. Trying to get answers from the participant of the workshop is a great idea to involve the staff in a great learning experience.

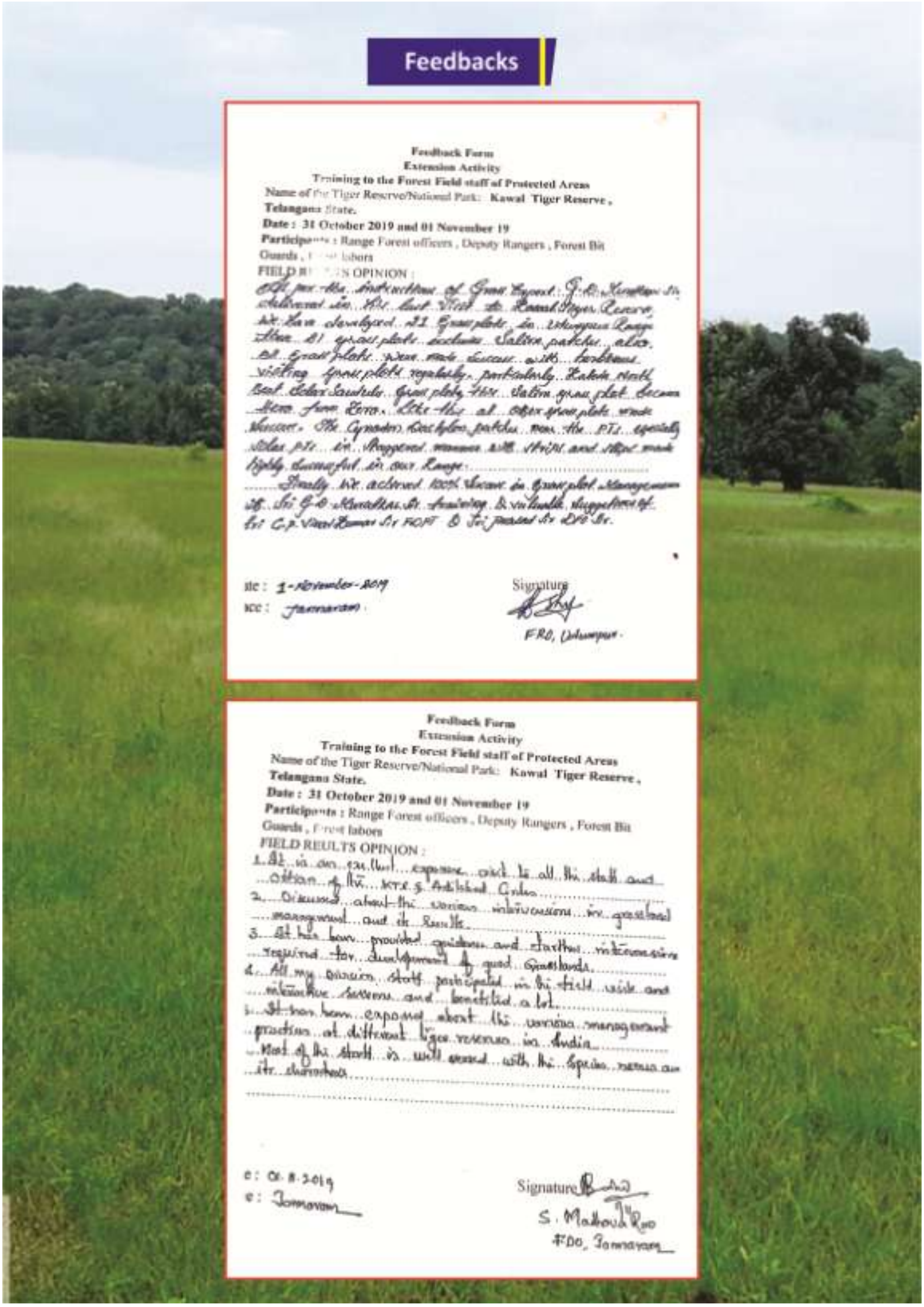
One aspect I would like to suggest is that, it will be of a great help to motivate the staff if a 1-2 hours powerpoint section showing the results achieved by grassland management across the country.

Overall this extension activity is very well planned and executed, and on behalf of ATR I would like to thank you for the inputs and we will work on these lines for development of Good Grasslands in ATR.

Thank you

Date : 30/10/2019
Place : Mannanur (A.T.R)

Signature 30/10/2019
(RAJASEKHAR, IFS)



Feedbacks

Feedback Form
Extension Activity
Training to the Forest Field staff of Protected Areas

Name of the Tiger Reserve/National Park: **Kawal Tiger Reserve, Telangana** State.

Date : 31 October 2019 and 01 November 19

Participants : Range Forest officers, Deputy Rangers, Forest Bit Guards, Forest labors

FIELD R[illegible] OPINION :

As per the instructions of Grass Expert Sri G.D. Kurulkar Sir, delivered in his last visit to Kawal Tiger Reserve, we have developed 21 grass plots in Udumpur Range. Here 21 grass plots includes Saltin patches also. All grass plots were made success with [illegible] visiting grass plots regularly, particularly [illegible] North Beat [illegible] grass plots this Saltin grass plot became [illegible] from zero. Like this all other grass plots made success. The Cynodon dactylon patches near the PTs especially solar PTs in staggered manner with [illegible] and [illegible] made highly successful in our Range.

Finally we achieved 100% success in grass plot management with Sri G.D. Kurulkar Sir training & valuable suggestions of Sri C.P. Vinod Kumar Sir FDPT & Sri [illegible] Sir DFO Sir.

Date : 1-November-2019
Place : Jannaram

Signature
[signature]
FRO, Udumpur.

Feedback Form
Extension Activity
Training to the Forest Field staff of Protected Areas

Name of the Tiger Reserve/National Park: **Kawal Tiger Reserve, Telangana State.**

Date : 31 October 2019 and 01 November 19

Participants : Range Forest officers, Deputy Rangers, Forest Bit Guards, Forest labors

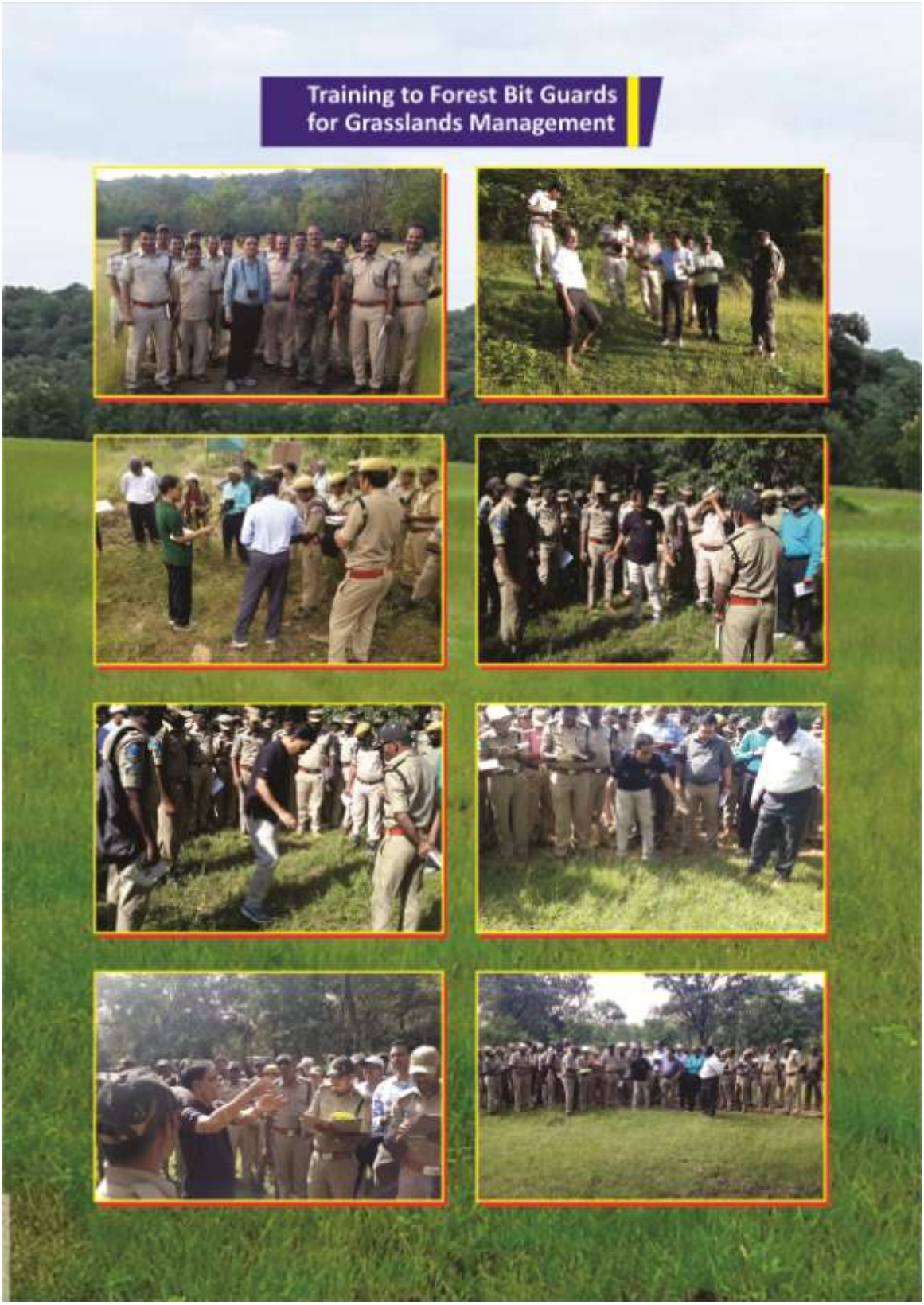
FIELD REULTS OPINION :

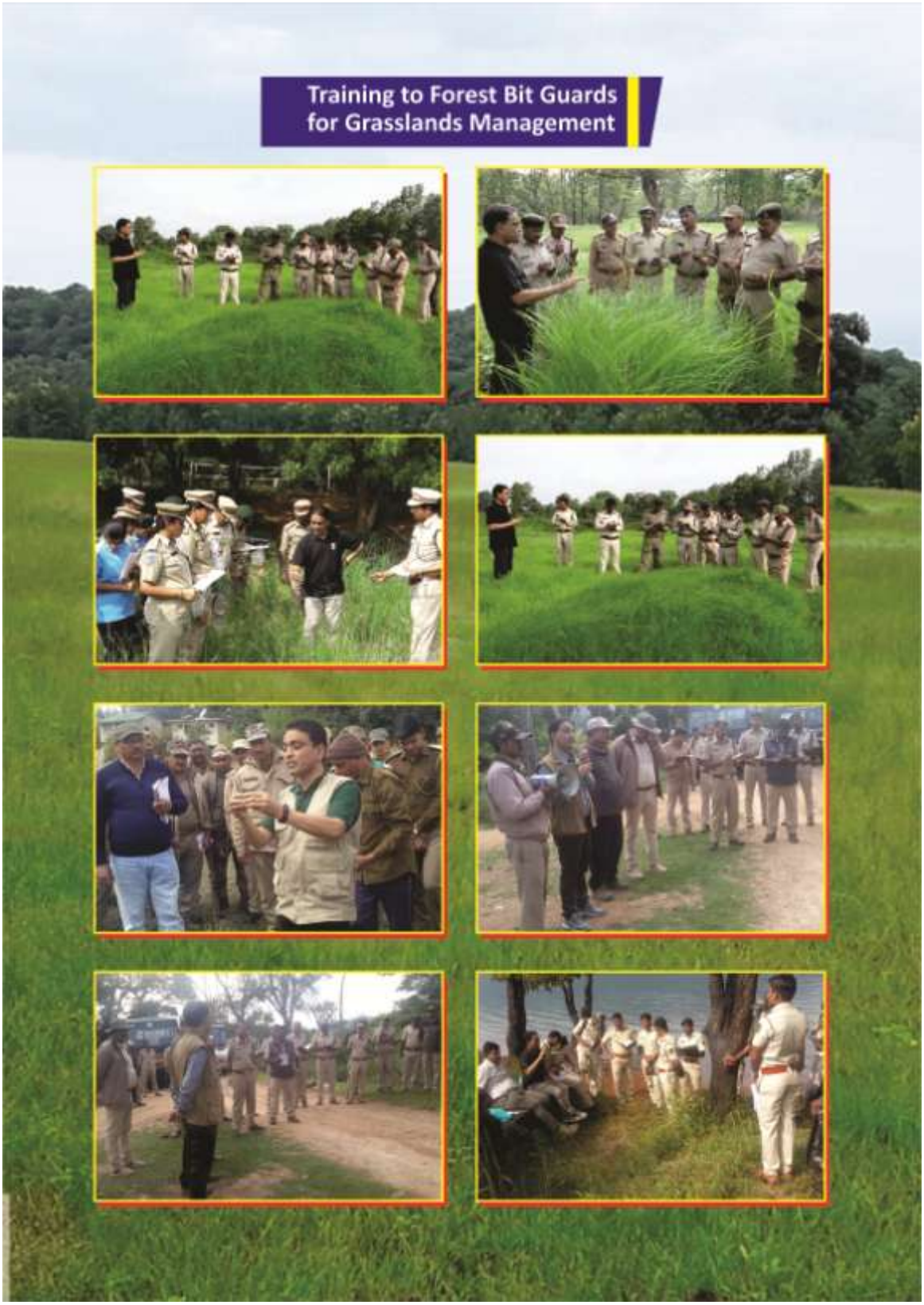
1. It is an excellent exposure visit to all the staff and officers of the KTR & Adilabad Circle.
2. Discussed about the various interventions in grassland management and its Results.
3. It has been provided guidance and further interventions required for development of good Grasslands.
4. All my division staff participated in the field visit and interactive sessions and benefitted a lot.
5. It has been exposed about the various management practices at different tiger reserves in India.

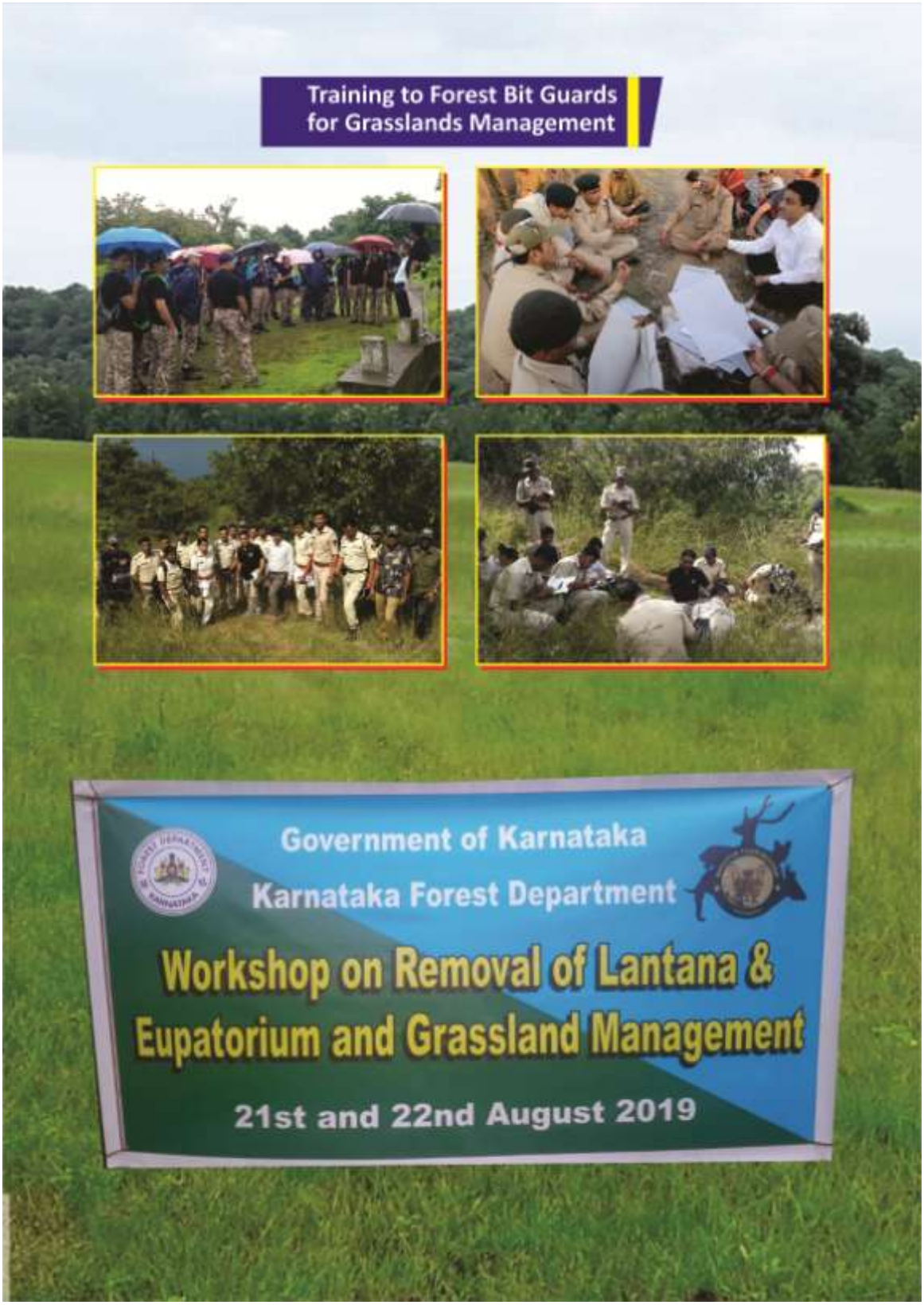
Most of the staff is well versed with the species names and its characters.

Date : 01.11.2019
Place : Jannaram

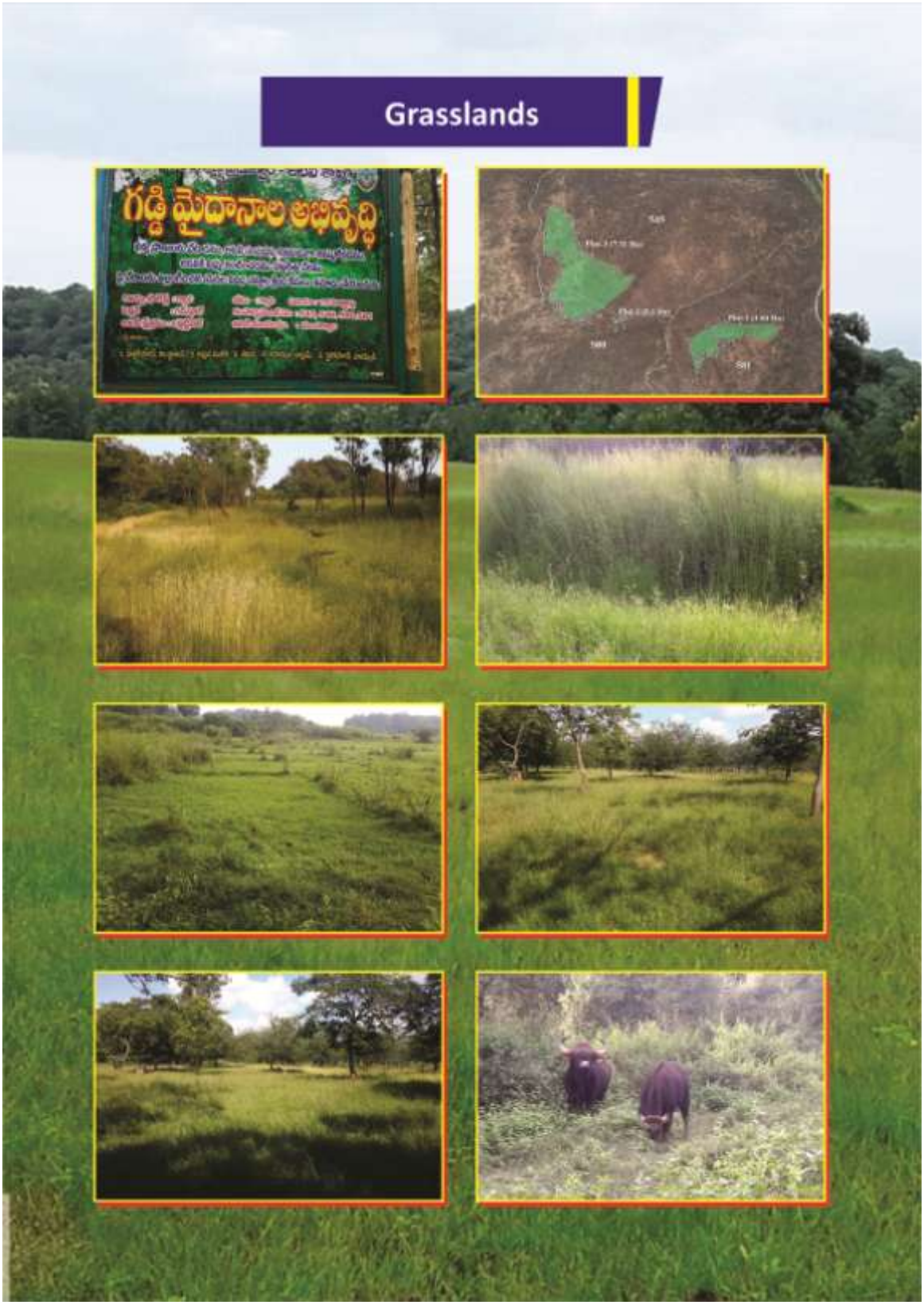
Signature [signature]
S. Madhava Rao
FDO, Jannaram

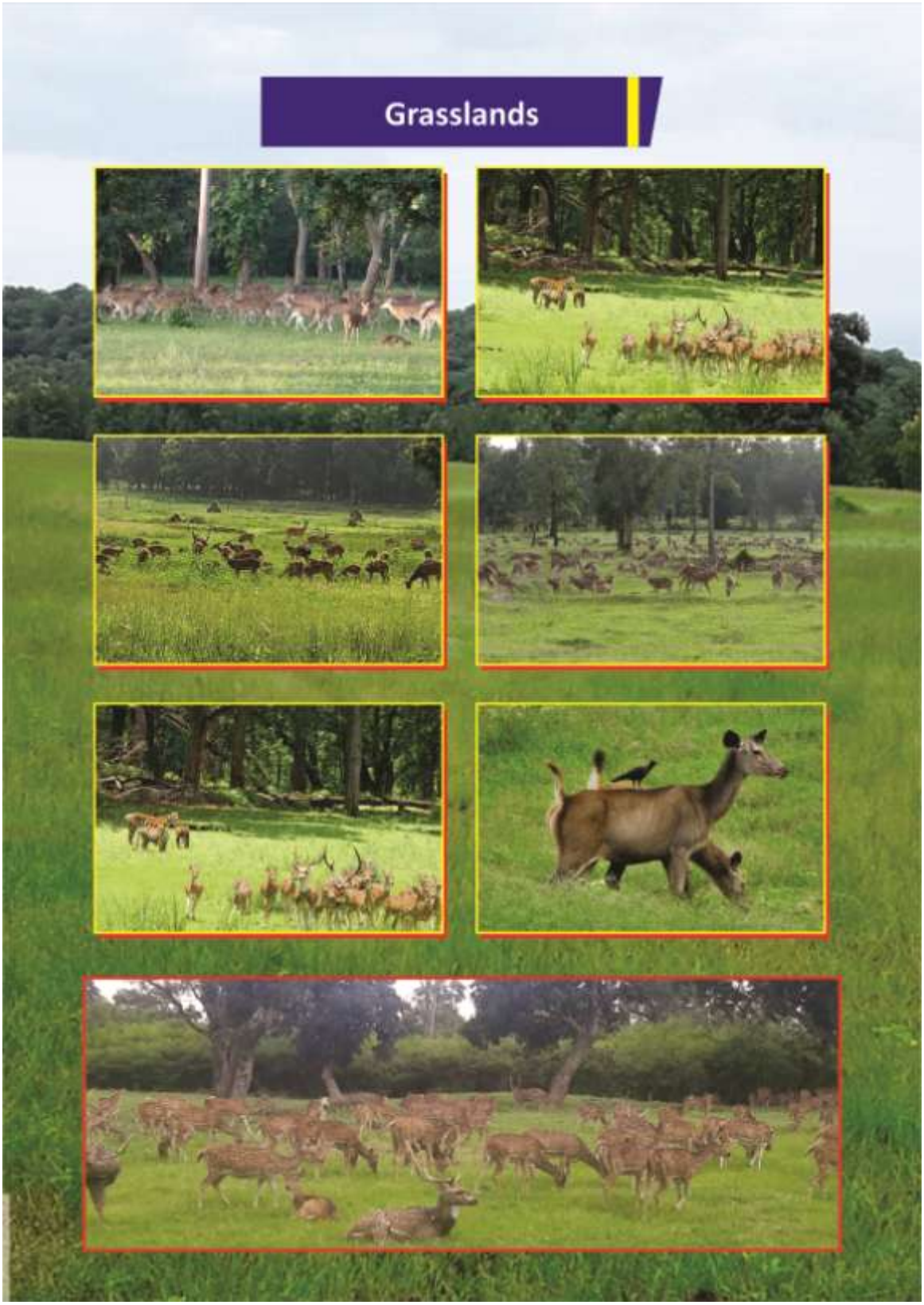

Training to Forest Bit Guards
for Grasslands Management

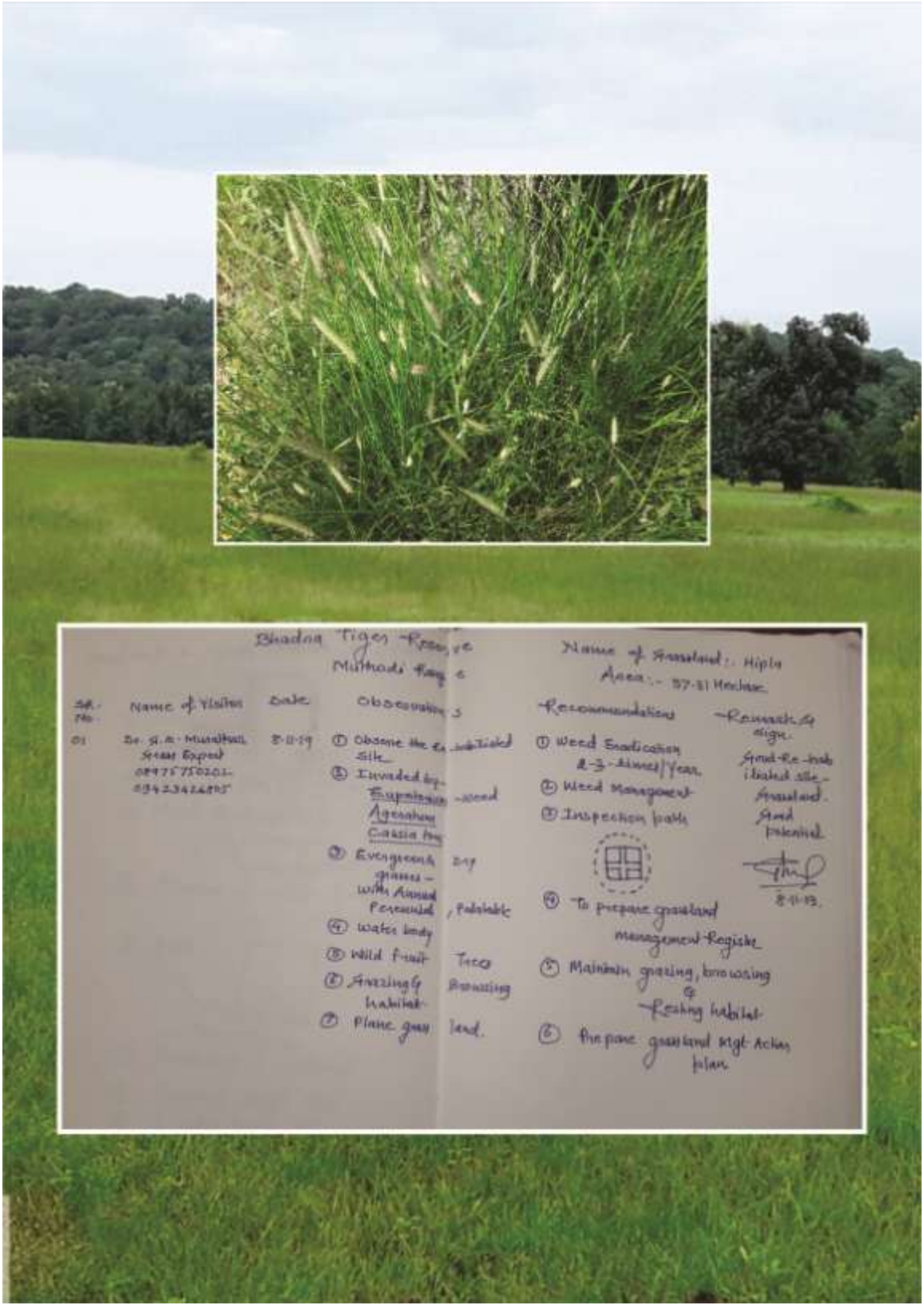

Training to Forest Bit Guards
for Grasslands Management


Training to Forest Bit Guards
for Grasslands Management
Government of Karnataka
Karnataka Forest Department
Workshop on Removal of Lantana &
Eupatorium and Grassland Management
21st and 22nd August 2019

Grasslands




Grasslands



Bhadra Tiger Reserve
Muthodi Range

Name of Grassland :- Hipla
Area :- 57-31 Hectare

Sr. No.	Name of Visitor	Date	Observations		Recommendations	Remarks & sign.
01	Dr. G. R. Murali... Grass Expert 08975750201 09423426805	8-11-19	① Observe the re-habilitated site ② Invaded by Eupatorium weed, Ageratum, Cassia tora ③ Evergreen & dry grasses with Annual, Perennial, Palatable ④ Water body ⑤ Wild fruit Trees ⑥ Grazing & Browsing habitat ⑦ Plane grass land.		① Weed Eradication 2-3 times/Year ② Weed Management ③ Inspection path ④ To prepare grassland management Register ⑤ Maintain grazing, browsing & Resting habitat ⑥ Prepare grassland Mgt Action plan	Good Re-habilitated site - Grassland. Good potential 8-11-19.

Extension Activity Report

"Training to the Frontline Staff of Forest Department for Grasslands Management in Protected Areas"

Training by

Prof. G. D. Muratkar

Assist. Prof. & Head Dept. of Environmental Science

Arts ,Science &Commerce College Chikhaldara

Dist. Amravati 444807 M. S.

Duration of Activity

2018-19 & 2019-20

Department of Environmental Science

Arts , Science & Comm. College Chikhaldara

Dist. Amravati 444807

Extension Activity Report

Department of Environmental Science **Academic**

Year 2018-19

1. Title of the Practice

Training to forest field staff for grasslands management in Protected Areas of India.

2. Goal

To train and motivate the forests field staff for grassland management and habitat improvement in Protected Areas.

Concept

To develop nutritive grasslands for herbivores in Protected Areas by Eradication of invasive weeds from grasses. To enrich the grasslands by broadcasting fodder grasses seeds in pre monsoon. Taller perennial, fodder grasses biomass management by cutting the grasses. To conduct field workshops for grasses seeds collection and weed eradication. To provide action plan for grassland management to field staff.

3. The Context

Grasslands are the green ground cover of protected areas in forest. The grasses are useful for grazing habitat of wildlife (Herbivores). The rehabilitated areas of Melghat Tiger Reserve and other tiger reserves have more cultivated lands, these lands are converted into the good grasslands by the field staff and forests labors.

The challenges in grassland management are woody species, brush woods, Weeds invasive. The eradication of weeds play vital role to increase the productivity of grasslands. Eradication of weeds, grasses seeds collection, enrichment of grasslands by seed sowing useful to develop and manage the good nutritive grasslands. The regular field guidance in grasslands in each season increases the confidence of field staff to develop good grasslands for the herbivores and works for habitat improvement and maintain prey predator relationship.

As per the request and invitation by Principle Chief Conservator of Forest and Head of Forest Force Telangana State the field workshop was organized to restore the grasslands and enrichment in August 2018 and May 2019.

The field Workshops was organized for root level frontline staff and the forest officers.

Beneficiary

Sr. No.	Name of State	Title of Activity	Beneficiary No.
1	**Telangana State**	To train and motivate the forests field staff for grassland management and habitat improvement	100 Bit Guard , Range officers , DFO , CCF
2	**Chhattisgarh State**	To train and motivate the forests field staff for grassland management	Bit Guard , Range officers , DFO , CCF

4. The Practice

The grassland development and management training practices in the field workshop are:

- Demarcation of grassland area by GPS
- Grasses identification
- Grasses seeds collection
- Weeds identification and eradication
- Seeds drying
- Seeds broadcasting technique to staff.
- Grasses plot management : Weeding , Demarcation , inspection path , monitoring
- Interconnection of grasslands
- Brushwood cutting in grasslands & along roadside areas

5. Evidence of Success

A) Developed the good grasslands for herbivores.

B) Field staff gets confidence to manage the grasslands.

C) Increase in the density of herbivores.

D) Habitats : Grazing , Browsing improved.

E) In relocated areas of the tiger reserves the cultivated lands are converted in to good grasslands.

6. Problems Encountered and Resources Required

Funding by state government to the forest department for grasslands management inadequete. Grasslands Management is time bound program.

The grassland management practices includes

1. To give the field training to the forests field staff in the natural grasslands and relocated areas of the Protected Areas in each season of the year.
2. To know the exact area of grassland year wise by demarcation of grassland area by GPS.
3. Grasses identification training to field staff by local names and scientific names.
4. Weeds identification with local names and their flowering season.
5. Browsing species identification with local names.
6. Field training to collect the grasses seeds and wild legumes seeds.
7. Weed eradication programme two times in a year
8. Grasslands enrichment by seed broadcasting in May - June season.
9. Grasses biomass management practices in mosaic pattern.
10. Wild fruit trees identification and addition in relocated areas.
11. Complete training programmes are organized by the CCF & Field Director of the respective Tiger Reserves in each season.

The practices in the field

Kawal Tiger Reserve, Telangana State

Arts, Science & Commerce College Chikhaldara

(Prof. S. D. Munakar)

PRINCIPAL
Art, Science & Commerce
College, Chikhaldara

32

Grassland Management Plan

Protected Areas of Telagana State

G. D. Muratkar, grass expert

Grasslands Restoration & Management Plan

 May : Geo-mapping of grassland areas.

 June : Brushwood identification and uprooting or cutting in proper way. **May**

25 -31 0r June 1-12th : **Grasses seeds broadcasting. (Nutritive grasses)**

- **July second week** : first de-weeding in proper way with identification.
- **August** : observation of grasses seeds germination.
- **September** : IInd phase of de weeding (Weed eradication should be before fruit formation)
- **October-November** : grasses identification & herbarium preparation.
- **September** : Wild leguminous plants identification.
- **November - December** : useful grasses seeds collection. These grasses seeds are useful for restoration practices after Lantana and Brush woods plants species eradication.
- **December**- January : grasses seeds drying, labelling and storages in Protection Camps areas.
- **December** : Identification of wild fruit trees and browsing plants species by plants expert.
- **November**- December : After rainy season management of all natural & artificial water bodies. (Removal of aquatic weeds, aquatic unwanted algal flora, remove terrestrial weeds) check eutrophication in water ponds.

Monitoring of grasslands in each season and its documentation by forests guard and deputy ranger staff of the protected area.

- To prepare grasslands observation and management register in each range of the Tiger Reserve.

Bandipur Tiger Reserve

Lantana Eradication and Restoration of Grasslands in Protected Area

Restoration Plan for grasslands (Duration 02 Years)

Sr. No.	Season	Management inputs	Remark
1	March - April	Site selection for Lantana uprooting as per need of habitat improvements	Lantana removal as per habitats of wildlife
2	April	Geo-mapping of Lantana eradicated area	To know the exact area for restoration of grasslands
3	April	Soil sampling of selected area	To know the suitability of grasses in soil as per physical and chemical characters
4		Identification of local grasses composition , wild fruit trees , browsing	To know the native grasses for grasslands restoration
5	May last week or June first week	1) Grasses seeds broadcasting 2) Rhizomes of grasses	To develop grassland as per soil parameters and topography
6	July	Bamboo rhizomes plantation	To maintain browsing spp ratio
7	August	Wild fruit trees plantation local only	To provide supplementary food to herbivores

8	August - September	To observe the rate of grasses seeds germination	
9	September	To prepare the inspection path in grasslands	For accurate monitoring
10	Season wise per year	Observations , documentation of habitat improvements work / restoration success rate	
11	February next year June Second year	Rate of seed dispersal and germination	Natural seeds dispersal and enrichment of grasslands with nutritive grasses
12		**Grasses species selection** 1) Dicanthiumannulatum 2) Dicanthiumcaricosum 3) Chlorisbarbata 4) Chlorisvirgata 5) Themedatriandra 6) Themedaquadrivalvis 7) Heteropogoncontortus 8) Cynodonbarberi 9) Iselimalaxum	All are nutritive /palatable grasses for herbivores Improves habitat of wildlife

Standard Operating Procedure for Grassland Management

Grasses are the Monocotylydones in angiosperms plants of the family Poaceae. The grasses are considered as ecologically well adopted plants. The grasses, shrubs, weeds, wild legumes, trees united to form the grasslands. The composition of the grasslands depends upon the topographical, climatic and edaphic factors. The grasses are of different types like annual, perennial, smaller, taller, intermediate, palatable (Fodder) and non-palatable (Non Fodder). The grasslands are of three types Smaller, intermediate and taller on the basis of the height of the grasses. The fodder or the nutritive value of the grasses depends upon the % of nutrients, fiber, ash and the water in aerial parts of the grasses. The grasses forms the green cover of the forests ecosystem and acts as major producers of the ecosystem.

The grasslands are composed of Grasses, weeds, Shrubs as browsers, wild leguminous plants, wild fruit bearing plants, water bodies (Seasonal /permanents), bamboos etc. The grasslands plays important role in wildlife habitat improvement like grazing, browsing, breeding, veloving, nourishing etc. The Palatability of grasses and their distribution in grasslands determines the utility percentage of the grasslands for grazing wildlife habitat.

The ecological significance of the grasses are

1) The grasses acts as soil binders in forests ecosystem.
2) Increases water holding capacity of the soil.
3) Maintain the nutrients level in soil.
4) Maintain humus % in soil.
5) Acts as good producers for herbivores and omnivores.
6) Maintain grazing food chain in forest ecosystem.
7) Nutritive value of the grasses maintains the health of the wild herbivores in Protected Areas.
8) Habitat management of wildlife in forests areas.

The forests ecosystem determines the type and composition of the grassland. The grassland management practices include.

1) To maintain the % of grasses in forest.
2) To increase the % of palatable or fodder grasses.
3) To maintain the % of wild leguminous plants for biological nitrogen fixation practices.
4) To eradicate the unwanted weeds from the grasslands in rainy, winter seasons.
5) To manage the grasses biomass by cutting practices.
6) Enrichment of the grasslands by broadcasting the seeds of wild legumes and more nutritive grasses.
7) The grasses seeds collection.
8) Brushwood cutting in proper season.
9) To prepare the grasses seed bank in each forest range areas.
10) Grasses seed broadcasting for enrichment of the grasslands.
11) To motivate and train the forests field staff for grasslands Management.
12) Regular monitoring of the grasslands by field staff.

Grasslands Management Practice

Soil : The earthy material present in troposphere belt of atmosphere is termed as soil . The process of soil formation is pedogenesis. The soil texture includes clay, silt, sand, loam, murum. The soil colors are black, red, white. Depending upon types of soil grasses distribution is variable, for example murmi soil : Themeda, Heteropogon, **Black soil :** Dicanthium, Iselima, Chloris, **Dry soil :** Schiema, **Moist soil :** Cynodon.

Soil moisture: Soil moisture depends upon the soil water (Capillary water, gravitational water, underground water), water bodies in grasslands, river water etc. Grasslands plays an important role in soil moisture conservation.

Grasses : Grasses are the monocotyledonous plants of the family Poaceae (Angiosperms). The advanced, modified family with modified root system, modified leaves, modified floral structure and seeds. The adventitious root system plays an

important role in soil conservation, water retention, moisture conservation and soil binders.

Grasses are of two types : Fodder and non fodder, annual, perennial.

Annual grasses : Apluda , Chloris

Perennial grasses : Cynodon . Dicanthium

Grasses can identify in flowering stage in October –November.

After identification with local names classify it in fodder or non-fodder category.

Prepare the grasses herbarium by using blotting paper and herbarium sheet in October –November.

Grasses seeds collection : Season of grasses seeds collection – November, December for annual or perennial grasses, except February for Themeda and Heteropogon.

Grasses seeds drying and storage : Grasses seeds after collection dry in direct sunlight for 10 days label it and sore in larger storage bag with proper ventilation. Label of grasses seeds include following data :

Grasses seeds collection data

1) Local name ----------
2) Botanical name ----------
3) Date of collection ----------
4) GPS Coordinates ----------
5) Bit number / Compartment number ----------
6) Name of seed collector ----------

Grasses seeds enrichment: grasses seeds after drying enrich in selected areas for enrichment of grasslands.

- Site selection in May
- Soil suitability for grasses
- Topography
- Enrichment season : May last week
- Demarcation with labelling
- GPS coordinates of enrichment

Grasslands : grasslands are of three types

1) Smaller grasslands
2) Intermediate grasslands
3) Taller grasslands

smaller and intermediate grasslands are most useful for grazing habitat.

Grasslands biomass management : Cutting of taller palatable and perennial grasses **before flowering is grasses biomass,**

Season : October First week, December

Weeds : herbs which degrade the grasslands are termed as weeds. Weeds are annual and perennial.

Weeds Management : Eradication or uprooting of weeds before flowering and fruiting is termed as weed management.

Weeds uprooting season : July and October

Weeds should be eradicated before fruiting and when soil is soft.

Wild Leguminous Plants : The concept of wild relatives of cultivated plants in a simple and lucid manner and described them „„as the wild plant taxon that has an indirect use, derived from its relatively close genetic relationship to a cultivated plant.Wild legumes are essential for providing a source of biological nitrogen fixation for enriching soil fertility (15–40 kg fixed N/ha), reduction in land degradation, disease breaks and for mitigating climate change. N2 fixation values of forage and fodder legumes will be less reliable and also estimates of % Ndfa (nitrogen derived from atmosphere) of fodder legumes in those lands.

Root nodule

The bacterium, rhizobium japonicum, colonizes the roots and establishes a nitrogen fixing symbiosis. Nitrogen is the most commonly limiting nutrient in plants. Legumes use nitrogen fixing bacteria, specifically symbiotic rhizobia bacteria, within their root nodules to counter the limitation. Rhizobia bacteria fix nitrogen which is then converted to ammonia. Ammonia is then assimilated into nucleotides, Amino Acids, vitamins and flavones which are essential to the growth of the plant. The plant root cells convert sugar into organic acids which then supply to the rhizobia in exchange, hence a symbiotic relationship between rhizobia and the legumes.

Root nodules occur on the roots of plants (primarily Fabaceae) that associate with symbiotic nitrogen-fixing bacteria. Under nitrogen-limiting conditions, capable plants form a symbiotic relationship with a host-specific strain of bacteria known as rhizobia.

The common wild leguminous plants in grasslands are :

Legumes : *Atylosiascarabaeoides, Crotalaria juncea, Crotalaria oryxense, Indigoferamoniliformis, Indigoferalinifolia, Indig oferatriga, Lathyru saphaca, Microtylomainiformis, Phaseolus vulgaris, Rhynchosia minima, Rhyncosiamaxima, Ureriapicta, Vignaaconitifolia, V. catjang,V. radiata var. radiatsa, V. radiata var. sublobata, V. trilobata , V. trilobata var. trilobata, Glycine soja.*

Wild Arhar

Wild Urd

Season of seed collection **:** November

Season of seed drying : December –January (20 days in direct sunlight)

Seeds enrichment : June

Importance of wild leguminous plants

- Increases fertility of soil

- Changes soil chemical composition
- Promotes the growth of grasses
- Legume presence significantly increased soil fertility, abundance and/or diversity of soil biota.
- Increases fodder value of grasses
- Enrichment of grasslands with leguminous plants.
- Legume presence is a good forest management practices. ▪ Increases association of grasses, heterogeneous grasslands ▪ Biological nitrogen fixation increases the % of N in soil.
- Increases the biomass of grasses
- Legumes can improve the resistance of soils to ecosystem disturbances, legumes may enhance the resistances of soil physico-chemical and biological properties to the ecosystem disturbance.
- legume plants is well known to improve soil N level and net primary productivity; besides, it may deliver other ecosystem benefits such as increasing soil carbon sequestration and soil food web complexity.
- Maintenance of soil health: leguminous crops fix the atmospheric nitrogen so it requires less inorganic fertiliser which protects the soil from its harmful effect. These crops also add the nitrogen into the soil which improves the soil fertility.
- Nutritional importance: leguminous crops are good source of protein
- Leguminous crops are important because they increase the fertility of soil by addition of nitrogen. In fact a nitrogen fixing bacterium named Rhizobium forms symbiotic association with the roots of leguminous crops and fixes nitrogen. The nitrogen fixed by the bacterium is also released in the soil thus contributing to soil fertility.
- Increases the humification of soil which is useful to maintain the soil nutrients, soil moisture in grasslands ecosystem.

Browsing plant species : the plants which provides food to wildlife are browsing species , Examples – Bamoo, Bahunia, Ber, Bel Leaves, Tiwasetc

Wild fruit bearing plants : Ber, Jamun, Tendu, Amla, Hilda, Belaetc

Management plan

Grasslands Development & Management Plan For :

Relocated sites of Protected Areas

Grasslands sites of the protected areas (Relocated areas) composed of natural grasses, weeds, small shrubs, woody climbers, parasites and wild leguminous plants.
Such area soil is degraded by the grazing pressure of domestic cattle"s and anthropogenic factors. The exotic weeds are invaded on large scale.

In protected areas the main objectives are To

manage the weed species in limited period.

- To know the natural grass flora distribution.
- To develop good heterogeneous grassland for herbivores.
- To reduce the woodland species.

Management Practices (Plan for the Development of grasslands)

- Collection and burning of weed species. (May)
- Addition of Browsing bamboo species along the boundaries of village area. (June- July)
- Addition of wild fruit trees by grid line randomly. (July)
- Addition of annual / perennial palatable grasses in plough areas by seed broadcasting. (Duration : May – 25^{th} to 30^{th})
- Management of natural water bodies by de-siltation.
- Weed Eradication programme : 1) June – July for new weed comers. 2) September – October : weed removal before flowering stages. 3) December – January : removal of succulent weeds .
- Seed collection of wild legumes.
- Weed removal: for continuous three years in proper period which will be useful for reduction of weed species.
- Management of Cuscutareflexa, Cucurbits form relocated sites in premonsoon period.

- Use of natural compost of the villagers in grasslands.
- On priority firstly: Manage the house places of the villages in which the weeds are on large percentage.
- Prepare the grass seed bank of two hectares by fence to develop the grass seed plot.
- After relocation : collect the grass seeds from the different locations in November – December , and broad cast the seeds in next pre monsoon period.

Grasslands Development & Management Plan For :

Degraded grasslands in Protected Areas

Grasslands of protected areas naturally composed of good heterogeneous grasses like Themeda, Apluda, Heteropogon, Dicanthium, Eragrostis, Sprobolus, wild sorghum and some wild fruit trees, browsing species for the herbivores.

Reasons for the grassland degradation

- Loss of soil moisture.
- Loss of mineral nutrients.
- Low water holding soil capacity.
- Pressure of exotic weed species.
- Growth of woody hardy species.
- Biotic pressure.
- In proper management in puts.
- Management of grasslands in un proper manner.
- Ratio of grass species and woody species.

Management Protocol

- Manage the natural water bodies like lakes, ponds , by de-siltation, linkages.
- Soil moisture conservation practices in proper period.
- Reduction woodlands species under 20-30 cm.

- Broadcasting of perennial palatable grass in May 25th 31st. Seeds of grass species, like Dicanthiumannualtum, Dicanthiumcaricosum, Themedatriandra, Themedaquadrivalvis, Panicummilliare, Setariapumilla, S. intermedia, Apludamutica.
- Addition of indeginious wild leguminous plants like wild moog, wild arhar, wild udid.
- Cutting of tall grasses twice in a year – November and January to maintain the grass biomass.
- Weed eradication programmes thrice in a year for continuous two to three years.
- To increase the % of perennial grasses by slips / tusks / seed broadcasting.
- Grass slips addition – June – july.
- Seed collection – November – December.
- Weed eradication _ Woody hardy species – June – July , Herbs weeds – in flowering stages or before seed formation
- Addition of browsing species like Bahunia, Helictoris, Bamboo along the boundries.
- Maintain eco friendly water holes.

Grasslands Development & Management Plan For :

Natural Grasslands in Protected Areas

Natural grasslands : "Grasslands with indeginious grasses species in the form of natural mesarch succession in the form of annual, perennial, palatable, non palatable grasses and wild fruit trees, browsing shrubs, climbers, runners and aquatic, amhiterrestrial grasses are the natural grasslands".

Composition

Natural grasses : Heteropogoncontortus, Themedatriandra, Themedaquadrivalvis, Dicanthiumcaricosum, D. annulatum, D. faveolatum, D. tuberculatum, D. strictum, D. strictum, Setariaverticellata, S. intermedia, S. pumilla, Spodiopogonrhizophorus, Sorghum prupureum, S. deccanensis, Apludamutica, Anthraxonlanceolatus,

Rottboliacochinchinensis , etc

Types of Natural grasslands

1) Taller grasslands

2) Intermediate grasslands

3) Smaller grasslands.

Wild legumes , Browsing plants , wild fruit trees.

Management Protocol

- To increase the % of perennial palatable grasses like –
    1. Dicanthiumcaricosum
    2. D. annulatum
    3. Bothrichloapertusa
    4. Themedaquadrivalvis
    5. Sacciolepisindica,
    6. Elusineindica
    7. Heteropogontriticeous
    8. Cynodondactylon
- Management of exotic invasive species like Pennesetium pedunculatum.
- Reduction of hard grasses like Aristida funiculata, A. reducta.
- To increase the % of wild legumes in grasses by seed collection and seed broadcasting.
- Add perennial grasses near water bodies.
- To maintain grass biomass of perennial, tall grasses like Heteropogon, Dicanthium.
- Weed eradication programme in proper period.
- Addition of wild fruit trees.
- To maintain the browsing plants in natural grasslands.
- Grass seed bank.

Threats to grasslands

- Forest fires
- Invasive / exotic weeds
- Soil degradation , loss of soil moisture
- Weeds infestation
- Human interference
- Exotic grasses

Grasses Seeds Broadcasting process / technique

Grasses seeds are very tiny / minute in size generally collected in December to February in each year. The seed dispersal take place by air/ wind.

Grasses Seeds of Dicanthiumannulatum

Stored collected grasses seeds

Procedure for grasses seed broadcasting in selected areas for enrichment / restoration

- Prepare the action plan for grasses enrichment.

- Dry the grasses seeds for 2 days in direct sunlight in May 3rd week to remove the moisture

- Mix the grasses seeds as per soil conditions or topography.
- Black soil – Dicanthium, Chloris, Digitaria.
- Red soil – Themeda, Heteropogon.
- Mix and rub the grasses with wooden stick before sowing.
- Take the grasses seeds in plastic container of suitable size.

- Take soil in container and add few quantity of suitable seeds in container.
- 250gm seeds in 2 kg soil with clay texture.
- Add few drops of water by hands to prepare the moist mixture.

- Shake the pot by two hands for 5 minutes to prepare grasses seeds ball of suitable size.

Grasses seed balls

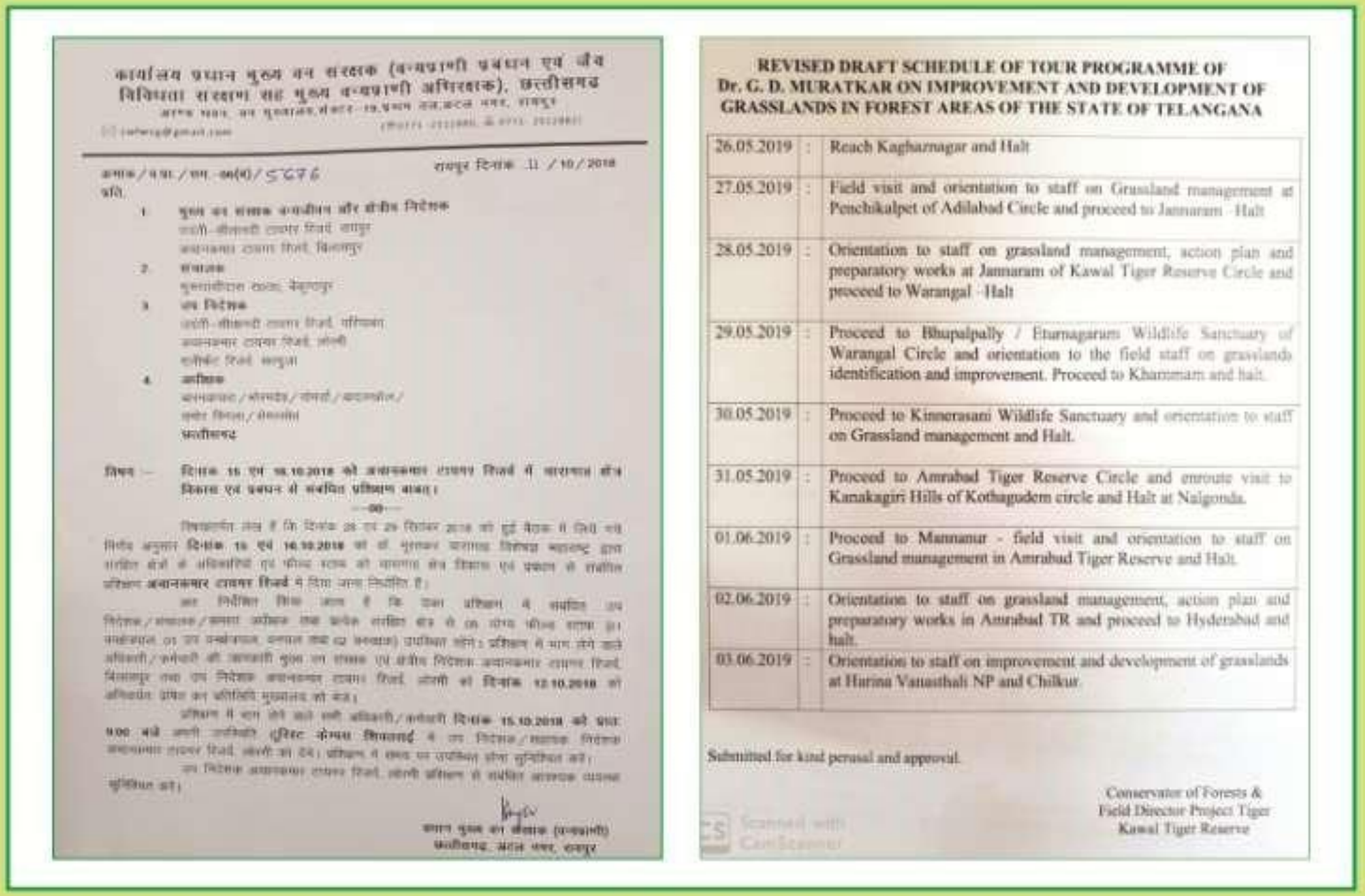
- You can simply add the punch of grass seeds in loose soil by covering after adding soil.
- The seed balls are used in older grassland but degraded by weeds.
- Simple punch of grasses seeds in open loose / fertile soil with good clay and moisture.
- Demarcate the soil area where grass seeds are added to observe the rate of seed germination after 17 days by good shower of rains.

Germinated grasses seeds after 17 days

- Grasses seeds to be broadcasted in last week of May or first week of June, as per rainfall pattern of forest area and climate.
- For wild legumes seeds no need of seed ball simply throw seeds 200 gmsin ½ hectares or 500gms per hectare with grasses mixture to get positive association.

Wild Legumes seeds

- After one month the results will be as under.
- Monitor the seed germination results regularly and take photograph of each and every step and maintain the record in grasslands management register. Results after grasses seeds broadcasting



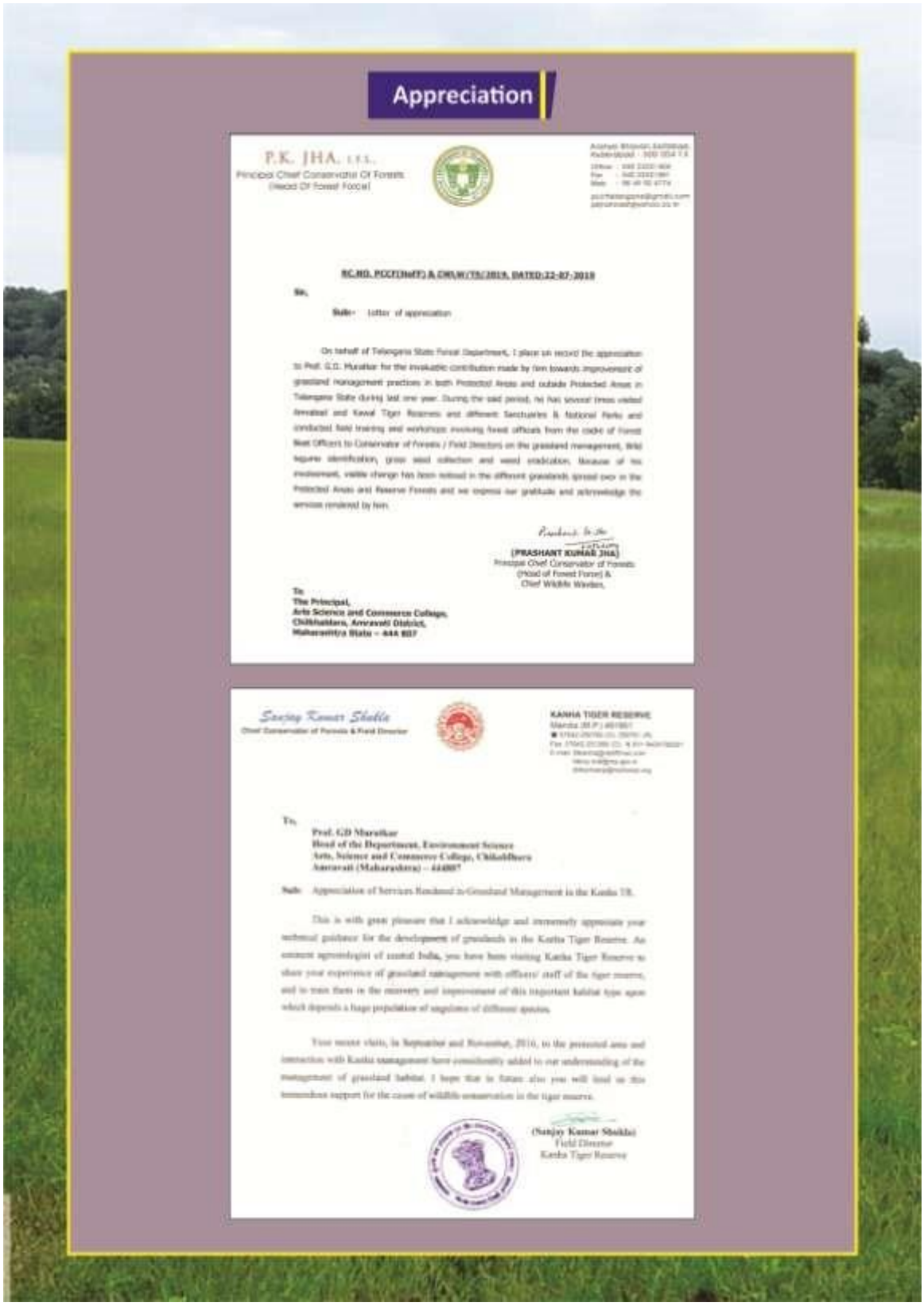
कार्यालय प्रधान मुख्य वन संरक्षक (वन्यप्राणी प्रबंधन एवं जैव विविधता संरक्षण सह मुख्य वन्यप्राणी अभिरक्षक), छत्तीसगढ़

REVISED DRAFT SCHEDULE OF TOUR PROGRAMME OF Dr. G. D. MURATKAR ON IMPROVEMENT AND DEVELOPMENT OF GRASSLANDS IN FOREST AREAS OF THE STATE OF TELANGANA

26.05.2019	:	Reach Kaghaznagar and Halt
27.05.2019	:	Field visit and orientation to staff on Grassland management at Penchikalpet of Adilabad Circle and proceed to Jannaram - Halt
28.05.2019	:	Orientation to staff on grassland management, action plan and preparatory works at Jannaram of Kawal Tiger Reserve Circle and proceed to Warangal - Halt
29.05.2019	:	Proceed to Bhupalpally / Eturnagaram Wildlife Sanctuary of Warangal Circle and orientation to the field staff on grasslands identification and improvement. Proceed to Khammam and halt.
30.05.2019	:	Proceed to Kinnerasani Wildlife Sanctuary and orientation to staff on Grassland management and Halt.
31.05.2019	:	Proceed to Amrabad Tiger Reserve Circle and enroute visit to Kanakagiri Hills of Kothagudem circle and Halt at Nalgonda.
01.06.2019	:	Proceed to Mannanur - field visit and orientation to staff on Grassland management in Amrabad Tiger Reserve and Halt.
02.06.2019	:	Orientation to staff on grassland management, action plan and preparatory works in Amrabad TR and proceed to Hyderabad and halt.
03.06.2019	:	Orientation to staff on improvement and development of grasslands at Harina Vanasthali NP and Chilkur.

Submitted for kind perusal and approval.

Conservator of Forests &
Field Director Project Tiger
Kawal Tiger Reserve



Appreciation

P.K. JHA, I.F.S.
Principal Chief Conservator Of Forests
(Head Of Forest Force)

RC.NO. PCCF(HoFF) & CWLW/TS/2019, DATED:22-07-2019

Sir,

Sub:- Letter of appreciation

On behalf of Telangana State Forest Department, I place on record the appreciation to Prof. G.D. Muralkar for the invaluable contribution made by him towards improvement of grassland management practices in both Protected Areas and outside Protected Areas in Telangana State during last one year. During the said period, he has several times visited Amrabad and Kawal Tiger Reserves and different Sanctuaries & National Parks and conducted field training and workshops involving forest officials from the cadre of Forest Beat Officers to Conservator of Forests / Field Directors on the grassland management, Wild legume identification, grass seed collection and weed eradication. Because of his involvement, visible change has been noticed in the different grasslands spread over in the Protected Areas and Reserve Forests and we express our gratitude and acknowledge the services rendered by him.

(PRASHANT KUMAR JHA)
Principal Chief Conservator of Forests
(Head of Forest Force) &
Chief Wildlife Warden,

To
The Principal,
Arts Science and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State – 444 807

Sanjay Kumar Shukla
Chief Conservator of Forests & Field Director

KANHA TIGER RESERVE

To,
Prof. GD Muralkar
Head of the Department, Environment Science
Arts, Science and Commerce College, Chikaldhara
Amravati (Maharashtra) – 444807

Sub: Appreciation of Services Rendered in Grassland Management in the Kanha TR.

This is with great pleasure that I acknowledge and immensely appreciate your technical guidance for the development of grasslands in the Kanha Tiger Reserve. An eminent agrostologist of central India, you have been visiting Kanha Tiger Reserve to share your experience of grassland management with officers/ staff of the tiger reserve, and to train them in the recovery and improvement of this important habitat type upon which depends a huge population of ungulates of different species.

Your recent visits, in September and November, 2016, to the protected area and interaction with Kanha management have considerably added to our understanding of the management of grassland habitat. I hope that in future also you will lend us this tremendous support for the cause of wildlife conservation in the tiger reserve.

(Sanjay Kumar Shukla)
Field Director
Kanha Tiger Reserve

Appreciation

Punati Sridhar, IFS
Principal Chief Conservator of Forests
(Wildlife), Bangalore

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Fax : 080-23346389
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Aranyabhavan, 2nd Floor,
18th Cross, Malleswaram,
Bangalore-560 003
Date: 23-02-2018

No. PCCF(WL)/B1/CR-159/2017-18

To,
Prof.G.D.Muratkar,
Head of Dept. Environmental Science,
Arts, Science & Commerce College, Chikaldhara,
Amravati,
Maharashtra-444807

Sir,

Sub: Appreciation for grassland improvement work in protected areas of Karnataka State.

* * *

This is to acknowledge with gratitude your immense contribution to the capacity building of our field as well as supervisory staff of the many protected areas for management and improvement of the grass lands.

The grasslands are an important component of the food pyramid of the PAs. Therefore, personally I feel that the increase in tiger numbers in B.R.T, Nagarahole & Dandeli in Karnataka in recent years can be attributed partly to your efforts.

I have no words to thank you for taking out your time to visit not only Tiger Reserves but also the lesser known sanctuaries and national park of the State multiple times in a year to train the staff and follow up on their progress on the ground. It has helped the staff in identification of palatable grasses and timely eradication of weeds, thereby constantly improving the quality of the grass lands. The training manual prepared by you will go a long way in further improving their capacity.

Once again we are grateful to you for your efforts and time and hope that you will continue to be associated with our protected areas in future also.

Yours faithfully,

Principal Chief Conservator of Forests
(Wildlife) Bengluru.

News Paper Cutting

గర్భ మైదానాల పెంపుపై అవగాహన

Grassland management expert visits Bejjur

Prof. G.D. Marattar with forest officials at a fodder plot in Bejjur range of Kagaznagar division on Monday.

News Paper Cuttings

Grassland management training begins

STATE BUREAU

A week-long grassland management training began in Kaghaznagar Forest division on Monday. Renowned grasslands expert Dr GJ Muratkar of Maharashtra is training forest officials in raising the grasslands and thus to protect herbivores that give rise to population of tigers.

Renowned grasslands expert Dr Muratkar of Maharashtra is training forest officials in raising the grasslands

Dr Muratkar explains tips to manage grasslands to forest officials in Kaghaznagar Forest division on Monday

During the event, Murathar explained insights and techniques to improve existing grassland habitat by enriching them with grass seeds. He trained the foresters in creating grasslands in solar-powered percolation tanks.

He visited compartment number 246 in Bejur Forest block under the Kaghaznagar division. He opined that Kaghaznagar Forest Division, being the gateway of Telangana for tigers inhabiting in Tadoba Andhari Tiger Reserve of Maharashtra, had the rich scope to become an important tiger habitat. He is scheduled to conduct a training session on the grassland management slated to be held in Jannaram forest division on Tuesday.

Field Director to Project Tiger, Kawal Tiger Reserve, and Conservator of Forests CP Vinod Kumar and District Forest Officials of Komram Bheem Asifabad, Mancherial, Nirmal and Adilabad district, L Ranjith Naik, Shivani Dongre, Prasad, Dr B Prabhakar, respectively, took part in the event. Kaghaznagar Forest Divisional Officer Rajaramana Reddy also present.

జీవ వైవిధ్యాన్ని కాపాడుకోవడమే లక్ష్యం

జూపార్కుల అభివృద్ధికి మాస్టర్‌ప్లాన్

Training to Forest Bit Guards for Grasslands Management








Training to Forest Bit Guards for Grasslands Management








Training to Forest Bit Guards for Grasslands Management








Training to Forest Bit Guards for Grasslands Management

Guidance to Forest Staff by Lecture

Extension Activity Report

Department of Environmental Science

Academic Year 2017-18

1. Title of the Practice

Training to forest frontline field staff for grasslands management and habitat management in Protected Areas of India.

2. Goal

To train and motivate the forests field staff for grassland management and habitat improvement in Protected Areas.

Concept

To develop nutritive grasslands for herbivores in Protected Areas by Eradication of invasive weeds from grasses. To enrich the grasslands by broadcasting fodder grasses seeds in pre monsoon. Taller perennial, fodder grasses biomass management by cutting the grasses. To conduct field workshops for grasses seeds collection and weed eradication. To provide action plan for grassland management to field staff.

3. The Context

Grasslands are the green ground cover of protected areas in forest. The grasses are useful for grazing habitat of wildlife (Herbivores). The rehabilitated areas of Melghat Tiger Reserve and other tiger reserves have more cultivated lands, these lands are converted into the good grasslands by the field staff and forests labors.

The challenges in grassland management are woody species, brush woods, Weeds invasive. The eradication of weeds play vital role to increase the productivity of grasslands. Eradication of weeds, grasses seeds collection, enrichment of grasslands by seed sowing useful to develop and manage the good nutritive grasslands. The regular field guidance in grasslands in each season increases the confidence of field staff to develop good grasslands for the herbivores and works for habitat improvement and maintain prey predator relationship.

As per the request and invitation by Principle Chief Conservator of Forest and Head of Forest Force Telangana State the field workshop was organized to restore the grasslands and enrichment in August 2018 and May 2019.

The field Workshops was organized for root level frontline staff and the forest officers.

Beneficiary

Sr. No.	Name of State	Title of Activity	Beneficiary No.
1	**Telangana State**	To train and motivate the forests field staff for grassland management and habitat improvement	40 Bit Guard , Range officers , DFO , CCF and field Director Saheb
2	**Karnataka State**	To train and motivate the forests field staff for grassland management	35-Bit Guard , Range officers , DFO , PCCF
3	**Madhya Pradesh**	To train and motivate the forests field staff for grassland management in Protected Areas of Madhya Pradesh –Satpuda Tiger reseve , Bandhavgad Tiger Reserve , Pench Tiger Reserve	68 Bit Guard , Range officers , DFO , CCF and Field Director saheb

4. The Practice

The grassland development and management training practices in the field workshop are:

- Demarcation of grassland area by GPS
- Grasses identification
- Grasses seeds collection

- Seeds broadcasting technique to staff.
- Grasses plot management : Weeding , Demarcation , inspection path , monitoring
- Interconnection of grasslands
- Brushwood cutting in grasslands & along roadside areas

5. Evidence of Success

A) Developed the good grasslands for herbivores.

B) Field staff gets confidence to manage the grasslands.

C) Increase in the density of herbivores.

D) Habitats : Grazing , Browsing improved.

E) In relocated areas of the tiger reserves the cultivated lands are converted in to good grasslands.

6. Problems Encountered and Resources Required

Funding by state government to the forest department for grasslands management inadequete. Grasslands Management is time bound program.

G. D. Muratkar
Asst. Professor & H.O.D.
Deptt. of Environmental Science
Arts,Science & Commerce College,
Chikhaldara

Arts, Science & Commerce College, Chikhaldara

PRINCIPAL
Art, Science & Commerce
College, Chikhaldara

Grassland Management Plan For Protected Areas of Telangana State

G. D. Muratkar(Grass expert)

Grasslands Restoration & Management Plan

- **May** : Geo-mapping of grassland areas.
- **June** : Brushwood identification and uprooting or cutting in proper way.
- **May 25 -31 0r June 1-12th : Grasses seeds broadcasting. (Nutritive grasses)**
- **July second week** : first de-weeding in proper way with identification.
- **August** : observation of grasses seeds germination.
- **September** : IInd phase of de weeding (Weed eradication should be before fruit formation)
- **October-November** : grasses identification & herbarium preparation.
- **September** : Wild leguminous plants identification.
- **November - December** : useful grasses seeds collection. These grasses seeds are useful for restoration practices after Lantana and Brush woods plants species eradication.
- **December-** January : grasses seeds drying, labelling and storages in Protection Camps areas.
- **December** : Identification of wild fruit trees and browsing plants species by plants expert.
- **November-** December : After rainy season management of all natural & artificial water bodies. (Removal of aquatic weeds, aquatic unwanted algal flora, remove terrestrial weeds) check eutrophication in water ponds.

Monitoring of grasslands in each season and its documentation by forests guard and deputy ranger staff of the protected area.

- To prepare grasslands observation and management register in each range of the Tiger Reserve.

Extension Activity Report

Department of Environmental science

Arts , Science & Commerce College Chikhaldara
Dist. Amravati

Training to the Front-line Staff For Grassland Management in Protected Areas

Academic Year

2017-18

The field Workshops was organized for root level frontline staff and the forest officers.

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Principal Chief Conservator Of Forests
(Head Of Forest Force)

RC.NO. PCCF(HoFF) & CWLW/TS/2019, DATED:22-07-2019

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(PRASHANT KUMAR JHA)
Principal Chief Conservator of Forests
(Head of Forest Force) &
Chief Wildlife Warden,

To
The Principal,
Arts Science and Commerce College,
Chikhaldara, Amravati District,
Maharashtra State – 444 807

Sanjay Kumar Shukla
Chief Conservator of Forests & Field Director

KANHA TIGER RESERVE

To,

Prof. GD Murarkar
Head of the Department, Environment Science
Arts, Science and Commerce College, Chikaldhara
Amravati (Maharashtra) – 444807

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(Sanjay Kumar Shukla)
Field Director
Kanha Tiger Reserve

Appreciation

Punati Sridhar, IPS
Principal Chief Conservator of Forests
(Wildlife), Bangalore

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18th Cross, Malleswaram,
Bangalore-560 003

No. PCCF(WL)/B1/CR-137/2017-18

Date: 23-02-2018

To,
Prof.G.D.Muratkar,
Head of Dept. Environmental Science,
Arts, Science & Commerce College, Chikaldhara,
Amravati,
Maharashtra-444807

Sir,

Sub: Appreciation for grassland improvement work in protected areas of Karnataka State.

* * *

This is to acknowledge with gratitude your immense contribution to the capacity building of our field as well as supervisory staff of the many protected areas for management and improvement of the grass lands.

The grasslands are an important component of the food pyramid of the PAs. Therefore, personally I feel that the increase in tiger numbers in B.R.T, Nagarahole & Dandeli in Karnataka in recent years can be attributed partly to your efforts.

I have no words to thank you for taking out your time to visit not only Tiger Reserves but also the lesser known sanctuaries and national park of the State multiple times in a year to train the staff and follow up on their progress on the ground. It has helped the staff in identification of palatable grasses and timely eradication of weeds, thereby constantly improving the quality of the grass lands. The training manual prepared by you will go a long way in further improving their capacity.

Once again we are grateful to you for your efforts and time and hope that you will continue to be associated with our protected areas in future also.

Yours faithfully,

Principal Chief Conservator of Forests
(Wildlife) Bengluru.

EXTENSION

Memorandum of Understanding

Memorandum of Understanding in Between Field Director and Chief Conservator of Forests Melghat Tiger Reserve , Amravati And Principal Arts , Science & Commerce College , Chikhaldara Talq. Chikhaldara , Dist Amravati 444807

Being Party of the First Part : Field Director and Chief Conservator of Forests Melghat Tiger Reserve , Amravati

Being Party of the Second Part : Principal Arts , Science & Commerce College , Chikhaldara Talq. Chikhaldara , Dist Amravati Where as Sipna Shikshan Prasarak Mandal , a public trust duly registered under the provision of Bombay Public Trust Act , 1950 , is running the Arts , Science and Comm. College Chikhaldara offers various courses in Arts , Commerce and Science streams for the students and also has expert faculties working in the college for imparting education to the students. And Where AS Chikhaldara comes under the Melghat tribal region , which is mainly a forest area having rich biodiversity. The Party of the First Part requires the Honorary Consultation Services and Scientific , Technical support from the Department of Environmental Science and Botany in the field of 1) identification of Grasses of Melghat Tiger Reserve , 2) Classification of grasses in to Palatable and Non Palatable ,3) Weeds identification ,4) Wild leguminous plants identification 5) Grasses Seeds Collection ,6) Grassland Management Practices for the herbivores 7) Preparation of Action Plan for Grassland Management. And Where As Prof. G. D. Muratkar , Head Dept. of Environmental Science of the college offered his selfless valuable consultation services and technical support in grassland management practices for the relocated sites of the Melghat Tiger Reserve from the year 2012-13 to current period of the year 2016-17.The Field Director and Chief Conservator of the Melghat Tiger Reserve , Amravati requested to provide the expertise services of Prof. G. D. Muratkar on honoray baisis.And Where As looking to the nature of work and its benefit to the forest and grassland ecosystem , food chain for herbivores and carnivores in general the Principal , Arts , Science & Commerce College , Chikhaldara accepted the request of the Hon,ble Field Director and Chief Conservator of Melghat Tiger Reserve.

Prof. G. D. Muratkar and his team will carry out the following training programmes for the field staff of the Melghat Tiger Reserve in the suitable season specially in Sunday , Holidays and vacations without any remuneration.

1) Grasses identification. 2) Weeds identification 3) Wild Leguminous plants identification 4) Seeds collection , storage and broadcasting 5) Enrichment of grasslands 6) Field workshop for field staff 7) Ecological Impact Assessment of Relocated Villages sites of MTR.

Date: 23/12/2016

Principal
Arts , Science and Commerce College
Chikhaldara

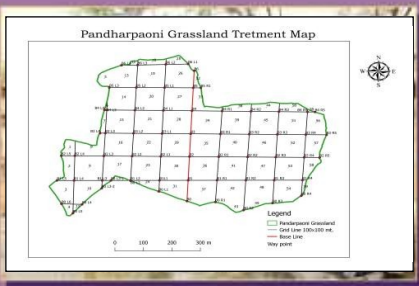
Field Director and Chief Conservator of Forests
MELGHAT TIGER RESERVE , AMRAVATI
Amravati.

Training to Forest Bit Guards for Grasslands Management

Training to Forest Bit Guards for Grasslands Management

Training to Forest Bit Guards for Grasslands Management

RESULTS



Intervention results

Sipna Shikshan Prasarak MandleAmravati's

Arts, Science And Commerce College Chikhaldara
Botany Department
Report on
Certificate Course in Ethnobotany
Academic Year 2017-18

Objectives – 1) Propogation and Conservation of Medicinal Plants
2) To aware the students of Botany about the Medicinal plants and their uses.
3) Identification,enumeration of Medicinal Plants of Melghat Forest.

Number of Beneficiatiary – B.Sc I yr 20 students (Botany)

Brief Report – Ethnobotany is the branch of Botany in which medicinal plants use by the tribal people for the cure of their diseases are studied.Under the XI plan Certificate course in Ethnobotany is granted. In this course we selected 20 students of Botany department , we prefare tribal students for the course. In the course we studied how the plants are identified on morphological characters. Then practically how the plants are propogated are studied,after that students collected the seeds of the medicinal plants. In this way, Identification, propogation and collection of seeds are studied.At the last practical and theory exam of students are taken and then certificate are provided to the students.

Incharge – Dr. Ujwala Ramesh Kokate, Head Department of Botany.

Dr. U. R. Kokate
Coordinator
Asst. Professor & H.O.D. (Botany)
Arts,Science & Commerce College
Chikhaldara

Principal
PRINCIPAL
Art, Science & Commerce
College Chikhaldara

Dr. U.R.Kokate, teaching the students

Students propogated the Medicinal

SIPNA SHIKSHAN PRASARAK MANDAL, AMRAVATI'S

ARTS, SCIENCE & COMMERCE COLLEGE, CHIKHALDARA

University Grants Commission, New Delhi Approved

Certificate Course in "Ethnobotany"

CERTIFICATE

This is to certify that

Mr/Ms. Devendra S. Waghmare

the withinsigned has successfully completed the prescribed Course of Studies and passed the Certificate Course in "Ethnobotany" approved by University Grants Commission, New Delhi in _____ *Division in the year 2014-15.*

Dated : 22 April 2015

Place : Chikhaldara.

Course Co-ordinator

Seal of College

Principal

PRINCIPAL
Art, Science & Commerce College, Chikhaldara