Research proposal Under the U.G.C.'s
Financial assistance scheme of
“Minor Research project”

---: Title:---

FLORISTIC AND ECOLOGICAL STUDIES OF
RESERVE FOREST OF VADGAM TALUKA OF
BANASKANTHA DISTRICT, NORTH GUJRAT

---: Research Scholar:---
ASHOK. H. PATEL
Municipal Arts & Urban Bank
Science College, Mehsana

Year
2007-2008
PART—A

Proposed Research Work

Proposal for a Minor research project

(1) **Broad Subject** :- Botany

(2) **Area of Specialization** :- Taxonomy

(3) **Duration** :- two year

(4) **Principal Investigator** :-

i  **Name** :- PATEL ASHOK KUMAR HARGOVANBHAI.

ii  **Sex** :- Male

iii  **Date Of Birth** :- 17th Aug. 1975

iv  **Qualification** :- M.Sc, B.Ed.

v  **Designation** :- Lecturer

vi  **Address** :- 23 - Peredise Banglows, Near Swaminarayan temple,

       Modhera road, Mehsana -2. [NORTH GUJARAT]

(5) **Co – Investigator** :-

(i)  **Name** :- DABGAR YOGESH BABULAL

(ii) **Sex** :- Male

(iii) **Date Of Birth** :- 4th Nov. 1970

(iv) **Qualification** :- M.Sc., Ph.D.

vii. **Designation** :- lecturer
viii. Address :-- R.R.MEHTA College of Science, Palanpur- 385001
               {NAAC – B⁺}
               Banaskantha dist. NORTH GUJARAT
               Office:-- ---- Residence:-- 9426041340

5. Name Of the Institute Where the project will be undertaken:
   (a) Department :--
       DEPARTMENT OF BIOLOGY,
       MUNICIPAL ARTS & URBAN BANK SCIENCE COLLEGE,
       MEHSANA    {NAAC – B++}

   (b) College/ University :--
       MUNICIPAL ARTS & URBAN BANK SCIENCE COLLEGE,
       MEHSANA .
       HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY,
       PATAN
       (Please mention the name of the affiliated university)

6. Whether the college/university is approved under section 2(f) and 12 B of
   the UGC Act ?
   -- yes

7. Teaching and research experience of principal investigator:
   (a) teaching experience: UG__9__ Years
       PG__2_ Years

   (b) Research experience: ----- nil
(c) Whether the project has been approved by the university for the doctoral degree? If so, please indicate:

i. Date Of Registration :- 25-09-2007

ii. Name and designation of the supervisor approved by the university :- Dr. B. K. JAIN

M.G. SCIENCE INSTITUTE, AHMEDABAD

iii. Name of the university where the registered:

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

(d) In case the teacher holds a doctoral degree :-

i. Title of the thesis:

ii. Year of the award of degree :

iii. Name of the university:

(e) Publication:

Papers Published :-

Accepted: Communicated:

Nil--- nil-nil--

Books Published :-

Accepted: Communicated:

Nil-- nil-nil—

(please enclose the list of paper and books published and/or accepted during last five years)
8. (i) project title:

FLORISTIC AND ECOLOGICAL STUDIES OF RESERVE FOREST OF VADGAM TALUKA OF BANASKANTHA DISTRICT, NORTH GUJARAT.

(ii) introduction:

- **Origin of the research problem**

  Gujarat is very rich in floristic composition. There are 2198 species of flowering plants belonging to 902 genera and 155 families which represent 12.91% flora of the country. Most of the studies have been made in south Gujarat by the botanists. Little work was done in north Gujarat. R. Asrai (1996) has worked on unpublished flora of Banaskantha. Though the flora of Gujarat is known through the contribution of several taxonomist, Sexton and Sedgwick (1918), Yogi (1970), and Shah (1978), However even today many areas are remained unexplored. The alarming rate of forest depletion due to various anthropogenic activities has considerable impact not only on the sustenance of resource but also on the floristic composition of several areas. These fact are well pronounced in a report – “Biological diversity of Gujarat – current knowledge” prepaid by Gujarat Ecological Commission (1996). Even the information about reserve forest of Vadgam taluka
areas are not well reported in flora of north Gujarat by Sexton and Sedgwick (1918) as well as in the flora of Gujarat state by shah (1978). Keeping these points in mind the reserve forest of Vadgam taluka of Banaskatha district, north Gujarat is selected for the floristic and ecological studies.

- **Interdisciplinary relevance :-**

  The diversity in forms, interdependence, food chains and food webs all are important for survival of all the living creatures on this planate, including the human being. Ours is one of the mega-diversity countries in the world. If we wish to continue to amongst these mega-diversity countries, we ought to pay more attention towards the conservation of species. The world is changing very fast and the environmental concerns are held in the highest esteem. Though late, Yet the conservation era as begun. We too have joined the global biodiversity conservation race too ensure that others do not take any under advantage of our complacency.

  Forest are recognized as substratum of life support system of the nature. They are the repository of heritage. Biodiversity and replensable source of food for the local inhabitants. The almighty as bestowed. The mother earth with the natural resources in such away that all the creatures can fulfill their basics needs. However, the human greed has caused and unlimited exploitation of the resource and today we have reached at the threshold the resource and of many invaluable spurious and sustained efforts towards sustainable conservation and development of
such resource (Singh, 2001). Floristic and ecological studies are to different expect of Botany one remaining taxonomic and other includes ecology, the two different field are more useful and valuable when they are combine studies. We can easily identify the plant, when absence of flowers and fruits. It is strongly proved that each species has specific set of ecological factors, which able to effect its existence. So I will know the floristic and ecological studies.

- **Review of Research and Development in the Subject:-**

  - **International status**

    The study of floristic and ecology of plant is related the concept of biodiversity hotspots the biologically riches and most endangered of forests. To promote the conservation of some of the most important ecosystems in the world of high biodiversity and great beauty.

    The purpose of the ecosystem profile in ecology is to preside and overview of the causes of biodiversity loss in a particular region and to couple this assessment with and inventory of current conservation activities in order to identify the niche.

    Due to rapid environmental changes the recorded flora of several areas have altered a lot and need constant monitoring and proper conservation strategy.

    For conservation of plant wealth of a particular forest area one should have through documentation and also one should know the quantitative as well as qualitative ecological status of plant species.
• **National status**

India is rich in biodiversity and it is one of the 12 mega diversity countries in the world. However rapid strides in agriculture and unbalanced exploration of forest resulted in a rapid decline of many different plant forms.

Even due to increasing demands of forest products and various anthropogenic activities many plant species have been disappearing without even being documented and scenario of forest has been changing day by day.

Forest has great impact on tribal’s life as they derive food, fodder, medicine and housing material from it. They peoples depends upon the forest for their survival in the lean reason as they collect and sell some items like honey, Some plants flowers and fruits, gum and timbre leaf from forest for income.

• **Significance of the study**

The present work will be on utmost value to the forest Department of Gujarat Government. This work will also provided a perfect qualitative and quantitative documentation for the further study.

(iii) **Objectives**

- Detail survey of plant species which includes family-wise life form documentation of flowering plants by means of simple collection.

  Identification and botanical description.

- Abundance, density and frequency of the plant species.
- Study of locally available, rare and endangered plant species.
- Anthropogenic pressure on plant species.
- Recommendation to conserve the plant species in the forest.

(iv) Methodology

The following methods will be used in the present study.

Floristic study will be identify by transect method. The area shall be survey on belt in their various routes on a monthly basic. The plants will be collected with /without and fruit stages and will identified on the spot and the plant which could not be identified will be brought to the Botany Department of Municipal Arts and Urban Bank Science college, Mehsana, for detail study and identification with the held of floristic key of Cooke (1903) and Shah (1978).

For the calculation of abundance, density and frequency of herbs, shrubs, tree and climbers systematic random sampling will applied.

· Year-vise plan of work and targets to be achieve.

First year ---

- Detail survey of plant species which includes family- wise life form documentation of flowering plants by means of simple collection. Identification and botanical description.
- Abundance, density and frequency of the plant species.
- Study of locally available, rare and endangered plant species.
Second year-- -

- Anthropogenic pressure on plant species.
- Recommendation to conserve the plant species in the forest.

• Details of collaboration. If any intended ------ no
• Financial assistance required.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Estimated Expenditure</th>
<th>Total</th>
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<td>Book and Journal</td>
<td>15,000</td>
<td>15,000</td>
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<tr>
<td>2</td>
<td>Equipment, if needed</td>
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<td></td>
<td>Camera, Developing charge</td>
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<td></td>
<td>Abnimetre</td>
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<tr>
<td></td>
<td>Field Microscope</td>
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<td>Vasculum</td>
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<td>Press for Herbarium cutter etc.</td>
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<td>33,700</td>
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<td>Field work</td>
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<td>5</td>
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<td></td>
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<td>1,23,700</td>
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10. Whether the teacher has received support for the research project from the UGC under Major, Minor, scheme of support for research or from any agency?

If so, please indicate:  

-------- Nil---------

(i) Name of the agency from which the assistance was approved
(ii) Sanction letter no. and date under which the assistance was approved
(iii) Amount approved and utilized
(iv) Title of the project for which assistance was approved
(v) In case the project was completed, whether the work on the project has been published
(vi) If the candidate was working for the doctoral degree, whether the thesis was submitted and accepted by the university for the award of degree.
   (A Summary of the report/thesis in about 1,000 words may please be attached with the application)
(vii) If the project has not been completed, please state the reasons

11. {a} Details of the project/scheme completed or ongoing with the P.I

<table>
<thead>
<tr>
<th>Name of the agency</th>
<th>Year Started</th>
<th>Year Completed</th>
<th>Total</th>
<th>Equipment/infrastructural facilities obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

{b} Institutional and Departmental facilities available for the proposed work

   Equipment :---

   **YES ...... some Research facilities available**

   Other infrastructural facilities :---

   **YES**

9. Any other information which the investigator may like to give in support of the proposal which may be helpful in evaluating.
To certify that ;--

a. The University/ College is approved under section 2{F} and 12{B} of the UGC act and is fit to receive grants from the UGC.

b. General physical facilities, such as furniture/space etc. are available in the Department /college.

c. I/We shall abide by the rules governing the scheme in case assistance is provided to me/us from the UGC for the above project.

d. I / We shall complete the project within the stipulated period. If I/We fail to do so and if the UGC is not satisfied with the progress of the research project, the commission may terminate the project immediately and ask for the refund of the amount received by me/us.

e. The above research project is not funded by any other agency.

Name & Signature

(a) Principal Investigator :

(b) Co- Investigator

{i}

(c) Registrar/Principal
TO – Joint secretary
University Grant Commission
Western Regional Office,
Ganesh Khind, PUNE -411007

Sub :-- To submitted minor research project under XI plan.

Respected Sir,

With respect about our subject and U.G.C guide line have I am submitted three copies of my minor research project in title FLORISTIC AND ECOLOGICAL STUDIES OF RESERVE FOREST OF VADGAM TALUKA OF BANASKANTHA DISTRICT, NORTH GUJARAT.

For your kind information our college is 22 year old. Our College is approved under section 2{F} and 12{B} of the UGC act and is fit to receive grants from the UGC

Thanking you,

Forward by
Registrar,
HEM. NORTH GUJARAT UNIVERSITY, PATAN

Your faithfully,
PATEL ASHOK. H.
Municipal arts & Urban bank
Science College, MEHSANA
Subject: Proposal for financial assistance under UGC scheme of Research Funding Council for Major/Minor Research Project during the 10th Plan period.

Madam,

With reference to the subject captioned above, I am forwarding hereinafter a proposal duly prepared in prescribed Performa, as per the following details for financial assistance for undertaking minor research project.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of College</th>
<th>Name of Teacher</th>
<th>Subject</th>
<th>Title of the Research Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Sheth H.P. Arts &amp; T.S.M. Commerce College, TALOD. S.K.</td>
<td>Dr. P.S. Patel</td>
<td>Gujarati</td>
<td>Folk Drama of Ramdev Pr.</td>
</tr>
</tbody>
</table>

The college is affiliated to this University and eligible for development assistance in terms of rules framed under Section-2 (i) and 12 (b) of the UGC Act, 1956.

Your good office is therefore requested to kindly consider the proposal favorably and approve necessary financial assistance to the concerned teacher as per the provisions of the UGC guidelines, at your earliest.

Thanking you.

Yours Faithfully,

I/C Registrar

Encl.- As above

Copy forwarded for information & N/A to:-

Phone : 222745, 230529, 230743, 233848, 220932  Fax : (02766) 231917
E-mail : regi@ngu.ac.in  Web site : www.ngu.ac.in
UNIVERSITY GRANTS COMMISSION  
Western Regional Office  
Ganeshkhind, Pune - 411 007.  

By Registered Post

F. No. 47-314/07(WRO)

The Principal  
Municipal Arts & UB Science College  
Nagalpur Rd. Highway, Mehsana - 384002.

Subject: Release of grants in aid.

Sir/Madam,

Please find enclosed D.D./ Cheque pertaining to release of grant-in-aid to your college as per following details:

- P.I.: Patel A H
- Sanction letter reference: 47-314/07(WRO), Dated 12.03.08
- Plan Period: 10th Plan
- Name of the Scheme: MRP (Science)
- D. D. / Cheque details: Bank Name: Canara Bank
- D. D. No: 326909
- Amount: Rs. 30000/-

Kindly acknowledge of this letter.

Yours faithfully,

Sd/

(Accounts Office)

(Since it is a computer-generated letter, signature is not necessary)
Date: March 12, 2001
Phones: (020) 2569147;
25691178,2569689
Fax: (020) 2569147
Web site: www.ugc.ac.in
E-Mail: ugcwro@gmail.com

File No: 47-314/07 (WRO)

The Accounts Officer
University Grants Commission
Ganeshkhind, Pune-411007


Sir,

The UGC on the recommendations of the Expert Committee has approved the Minor Research Project entitled “Floristic and ecological studies of reserve forest of Banaskantha dist” in the subject- Botany to be undertaken by Patel A H, Municipal Arts & UB Science College, Nagpur Rd. Highway, Mehsana. The financial assistance of the UGC would be limited to Rs.50000/- (Rupees Only) for a period of two years. An amount of Rs.30000/- (Rupees Only) is presently being sanctioned as the first installment.

<table>
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<tr>
<th>Non-Recurring Grant for Two years</th>
<th>Amount (Rs)</th>
<th>Recurring Grant</th>
<th>1 Year Amount</th>
<th>2nd Year Amount</th>
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<td>Books &amp; Journals</td>
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<td>Special Needs</td>
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<td>Chemicals</td>
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<td>5000</td>
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<td></td>
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<td>Extension Activities</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Total (Rs.)</td>
<td>10000</td>
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<td>20000</td>
<td>20000</td>
</tr>
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</table>

Total amount for the project: 50000/-

The grant is subject to the terms and conditions as mentioned below.

1. A Certificate of Acceptance of the conditions governing the research project should be sent immediately to this office.

2. The amount of the grant shall be drawn by the Accounts Officer (D.D.O), University Grants Commission on the grant-in-aid bill and shall be disbursed to and credited to the above-mentioned institute through Cheque/D.D.

3. The sanctioned amount is debatable to the major Head 5.3.3. and is valid for payment during the financial year 2007-2008 only.

4. The grant is subject to adjustment on the basis of Utilization Certificate in prescribed proforma submitted by University/College/Institute.

NOTE:

1. Date of implementation will be the date of sanction and receipt of first installment.

2. Please send the Acceptance Certificate to this office immediately (copy enclosed)

3. Please send one copy of the project completion report (PCR) to Director, INFLIBNET, Gujarat University Campus, Navrangpura, Ahmedabad for records.
FLORISTIC AND ECOLOGICAL STUDY OF RESERVE FOREST OF VADGAM TALUKA OF BANASKANTHA DISTRICT OF NORTH GUJARAT.

Chapter – 1: Introduction.

Biodiversity is the variety of life on the earth. India is rich in biodiversity. Indian flora accounts for 10.78% of the total global flora. Biodiversity such as all forests is currently facing an unprecedented destruction by human and environmental changes which result in the expiration of many forests flora and fauna. Forest has great impact on tribal’s life as they derive food, fodder, medicine and housing material from it. In developing countries the heaviest demand on forests is for fuel wood. Even due to increasing demands of forest products and various anthropogenic activities as a result many plant species have been disappearing without even being documented and scenario of forest has been changing day by day.

We ought to pay more attention towards the conservation of species, because the world is changing very fast and the environmental concerns are held in the highest esteem. However, this rich biodiversity of India is rapid strides in agriculture and unbalanced exploration of forest resulted in a rapid decline of many different plant forms. So its severe threat owing to habitat, destruction, fragmentation and over-exploitation of resources.

Therefore, assessment and documentation of biodiversity has become an urgent need of the day. There is need for repeated floristic studies to assess biodiversity to know the changes in floristic composition of region in time and space, Due to rapid environmental changes the recorded flora of several areas have altered a lot and need constant monitoring and proper conservation strategy. So that required efforts can be made to conserve maximum biodiversity, its utilization in sustainable manner and to provide solutions to the global problems. So I will know the floristic and ecological studies.

Gujarat is very rich in floristic composition. Several taxonomists Asrai (1996), G. L. Shah (1978), Sexton and Sedgwick (1918) did continue to survey the forest areas and many new records for North Gujarat were added at regular intervals. Although the records of some parts of North Gujarat is unknown, there are still many areas, which have yet, remained unexplored. Sebhargog region of Vadgam taluka in Banaskantha district of North Gujarat is remain unexplored and underexplored.

Most of the earlier workers have not covered forests of Vadgam taluka reserve forest for taxonomical study. Moreover, in the work of above mentioned taxonomists about study of the Sebhargog region of Vadgam taluka is remain unexplored.
Keeping the above mentioned point in mind the following work is carried out in the present study.

- Prepared an illustrative scientific documentation of diversity of Angiosperm species occurring in the Vadgam range forest of district Banaskantha,
- Made detail survey of plant species which includes family wise life forms documentation of flowering plants by means of simple collection, Identification and botanical description..
- Studied Abundance, density and frequency of the plant species.
- GBH of individuals of the tree species measured.
- Survey is made to collect information on locally available, rare and endangered plant species.
- Observed vegetation association of plant species.
- Studied Anthropogenic pressure on plant species.
- Recommendations are made to conserve the plant species in the forest.

Chapter – 2 : Review of literature.

In this chapter, an attempt has been made to review the relevant and related literature pertaining to the present study from various floras, research journals, books, websites and other related literature. For developing a conceptual framework and an appropriate design for study, a review of past study is necessary. Therefore, a brief account of the work reported by the past researchers was reviewed.

Flora of a nation is the basic guide to its wealth of vegetation, as the systematic botany mostly deals with wild species. "Flora of India" is long cherished dream of Indian taxonomists. Now many research institutions in India viz. Botanical Survey of India, Forest Research Institute are actively engaged in taxonomic work.

Floristic studies have been carried out by so many scientists in India. J. D. Hooker had published 7 volumes of “Flora of British India” (1872 – 1897). This resulted in the publication of a number of provincial floras, such as the Flora of the Presidency of Bombay (Cooke, 1901-1908). Several floras of small areas such as Flora of Khandla (H. Santapau, 1953), The Flora of Saurasthra (H. Santapau, 1962), Flora of the Rajasthan Desert (M. M. Bhandari, 1977), have been published at stimulating critical taxonomic research in India.

The science literature have made significant contribution to the knowledge of the flora of this region—Records of Botanical Survey of India, Annals of the Royal Botanic Garden,

Most of the studies have been made in south Gujarat by the botanists. Little work was done in north Gujarat Asari (1996) who has worked on unpublished flora of Banaskantha. The flora of Gujarat is known through the contribution of several taxonomist, Sexton and Sedgwick (1918), Yogi (1970), and Shah (1978),

Several taxonomists did continue to survey the forest areas and many new records for North Gujarat were added at regular intervals, such as, "Plants of Northern Gujarat" (Saxton and Sedgwick, 1918; Saxton, 1922) and "A contribution to the Flora of North Gujarat" (Yogi, 1970). Two forest ranges such as Ambaji and Danta of District Banaskantha were explored for floristic study by Patel, (2003) and Patel, (2003). The forest of Sabarkantha (Dholvani) forest range were explored for floristic study by Sidana (2004) & Patel (2004). The Tarngra forest of Mehsana district range was explored for floristic study by Patel, (2004).

Phytosociological work of Danta taluka of Banaskantha district is carried out by Patel (2000) and Patel (2002). Some Ethnobotanical of Aravalli in Banaskantha is carried out by Ant (2000). So it indicates that taxonomical study and Ecological survey on Vadgam taluka is particularly remained unexplored till today.

Looking to this present work is carried out Floristic and Ecological study of reserve forest of Vadgam taluka of Banaskantha District of North Gujarat.

Chapter – 3 : Methodology

For floristic survey, tripe were made at regular intervals to various part of Vadgam taluka and collected plants are preserved by standard method.

For Phytosociological analysis transect method applied, and values were calculated by methods of Sharma (2004).

Endangered species were recorded on the basis of abundance and frequency.

For Anthropogenic pressure regular trips in the study area were made and found some specific character and also interview, discussions with local people.

For conservation of study area several recommendation and suggestion to tribal people, NGOs, government and prepared action plan.
Chapter – 4 : Results and discussion

4.1 Prepare an illustrative scientific documentation of diversity of Angiosperm species occurring in the study area.

The present study enumerated 536 species, which belonged to 369 genera and 109 families of flowering plants.

Out of which, Dicotyledons contributed 446 plant species belonging to 306 genera and 89 families, Which is quite higher than that of Monocotyledons.

<table>
<thead>
<tr>
<th>Class</th>
<th>Sub-Class</th>
<th>No. of Families</th>
<th>No. of Genera</th>
<th>No. of Species</th>
</tr>
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<td>Dicotyledons</td>
<td>Polypetalae</td>
<td>48</td>
<td>145</td>
<td>213</td>
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<tr>
<td></td>
<td>Gamopetalae</td>
<td>27</td>
<td>124</td>
<td>176</td>
</tr>
<tr>
<td></td>
<td>Monochlamydae</td>
<td>14</td>
<td>37</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td><strong>Total (%)</strong></td>
<td><strong>89 (81.65)</strong></td>
<td><strong>306 (83.38)</strong></td>
<td><strong>446 (83.21)</strong></td>
</tr>
<tr>
<td>Monocotyledons</td>
<td><strong>20 (18.35)</strong></td>
<td><strong>61 (16.62)</strong></td>
<td><strong>90 (16.79)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>109</strong></td>
<td><strong>367</strong></td>
<td><strong>536</strong></td>
</tr>
</tbody>
</table>

Dicotyledons:

They are very dominant in this area. The present study enumerated as under:

Polypetalae: Among the Dicotyledons, it is dominant and represented by 203 species, 1 sub species and 9 varieties belonging to 145 genera and 48 families with cultivated and wild plants.

Gamopetalae: It finds the second place and it is represented by 26 families containing 124 genera and 174 species including 2 varieties. The largest family of this subclass is Asteraceae, which is represented by 29 species belonging to 24 genera.

Monochlamydae: It is represented by 14 families, 37 genera and 57 species. The largest family of this group is Euphorbiaceae containing 21 species belonging to 13 genera.

Monocotyledons:

They are very poorly represented as compared to dicotyledons in this area. 61 genera and 90 species belonging 20 families of Monocotyledons found in the study area. Area contains 14 species belonging to Cyperaceae and 40 species to Poaceae, while the remaining 25 species belong to 17 families.
4.2 Detail survey of plant species which includes family wise life forms documentation of flowering plants by means of sample collection, identification and botanical description.

Total 536 plant species were studied for taxonomical purpose. For study of Botanical description, habitat, habit, vegetative characters - stem, root, leaves, inflorescence, floral characters and floral parts- calyx, corolla, stamens, gynoecium, fruit and seed of each plant species were taken into consideration.

Above mentioned the plant species are indentify with the help of standard floras.

The Physiognomic categories of these species are as under,

<table>
<thead>
<tr>
<th>Class</th>
<th>Climber</th>
<th>Herb</th>
<th>Shrub</th>
<th>Tree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicotyledons</td>
<td>69</td>
<td>215</td>
<td>84</td>
<td>78</td>
<td>446</td>
</tr>
<tr>
<td>Monocotyledons</td>
<td>3</td>
<td>80</td>
<td>1</td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>72</td>
<td>295</td>
<td>85</td>
<td>84</td>
<td>536</td>
</tr>
</tbody>
</table>

I have observed total 295 herbs which is represented as a dominant species as seen in Palanpur range forest. It is very less number in Mokeshwer, Sedhani and Serpura(Shebhar) in Danta range. The trees and climbers are distributed in equal numbers in both ranges. Shrubs are dominant in a Danta range forest.

4.3 Abundance, density and frequency of the plant species.

For phytosociological studies sample plots were laid down in all the villages which have reserve and non reserve forest in our study area. Viz. Serpura, near Sebharog temple, Bhakhari, Nava serpura, NaviSedhani, Sedhani, Motipura, Paniari, Dhoda, Jalotra, Joita, Pavathi, Dhori, etc. Total 165 plots were demarcated and studied in these area.

Present area have a good diversity of among tree species totally 84 species have been recorded. Trees which are having more than 10 cm GBH are counted and frequency of all the tree species is calculated.

For the study of dominant tree species, *Acacia nilotica* (L.) Del. is repersenting no. of 3206 trees. five tree species are available in number of 10266 out of 17799 trees, remaining other species having 7533 no. of trees.
For the study of GBH maximum number of trees (15587) fall under 11 to 60 cm GBH range and 1744 trees come under the GBH range between 61 and 120 cm and only 23 trees come under the GBH range between 181 Cm. and above. The maximum GBH is reported in the *Ficus benghalensis*.

Total 295 Herb species were reported in the study area. *Achyranthes aspera* L. var. *aspera*, *Cynodon dactylon* (L.) pers., *Alternanthera sessilis* (L.)Dc., *Indigofera cordifolia* Heyne ex Roth, *Cassia tora* L., *Indigofera linifola* Retz. *Cyperus rotundus* L. having maximum frequency, abundance and density.

The various herbs species are seen in various season. Some herb species passed his life cycle in short period. Ex. *Chlorophytum borivilianum* Sant. & Fernand. *Chlorophytum tuberosum* (Roxb.) Baker *Oxalis corniculata* L.etc.

The following herb species are reported to be growing only in monsoon *Achyranthes aspera* L. var. *aspera*, *Cynodon dactylon* (L.) pers., *Alternanthera sessilis* (L.) Dc., *Indigofera cordifolia* Heyne ex Roth., *Indigofera linifola* Retz. *Cyperus rotundus* L. *Ocimum gratissimum* L., *Phyllanthus fraternus* Webst. etc.

The following herb species are reported to be growing only in summer: *Agave Americana* L., *Argemone maxicana* L., *Asphodelus tenuifolius* Cav., *Barlaria prionitis* L., *Cassia tora* L., *Typha angustata* Bory & Chaub etc.

The following herb species are reported to be growing only in winter in the forest area. *Bergia capensis* L., *Plumbago zeylanica* L., *Polycarpacea corymbosa* (L.) Lam., etc.

Total 84 shrub species were recorded in study area.

**Graph:**-- Dominant shrubs species.
Shrub species having highest frequencies bearing by *Capparis sepiaria* L. (80.61 % frequency), *Capparis decidua* (Forsk.) Edgew. (70.3 % frequency), *Abutilon indicum* Guill. (56.36 % frequency), *Sida ovata* Forsk. (52.73 % frequency), and *Kirganelia reticulata* (Poir.) Baill. (52.73 % frequency).

Climbers are beauty of this area. For the study frequency, density and abundance were calculated. *Ipomoea pes-tigris* L. (74.55 % frequency, 7.28 density and 9.76 abundance), *Rhynchosia minima* (L.) DC. (72.12 % frequency, 6.86 density and 9.51 abundance), *Cocculus hirsutus* (L.) Diels (61.82 % frequency, 5.77 density and 9.33 abundance), *Abrus precatorius* L. (59.39 % frequency, 4.34 density and 7.31 abundance), *Tinospora cordifolia* (Willd) Miers (52.12 % frequency, 6.27 density and 12 abundance), *Asparagus racemosus* Willd. (46.67 % frequency, 5.76 density and 12.3 abundance), *Pergularia daemia* (Forsk.) Chiov. (43.64 % frequency, 3.88 density and 8.9 abundance) are calculated.

Mostly climber species are growing in monsoon after first rain. Climber are much observed in dense area of forest.

### 4.4 Study of locally available Rare and endangered plants species.


### 4.4 Anthropogenic pressure on plant species

Mostly cause of forest destruction have generally been grouped in two categories viz. Natural and Man made (Anthropogenic).

Due to anthropogenic pressure like Over-exploitation of species, Heavy grazing by livestock, Grass cutting, Lopping and cutting of trees for fodder and timber, Fire and firewood collection,
Collection of NWFP, Mining, Construction of chake-dam and road, Poaching, Indiscriminate botanical collection, Encroachment, Ecotourism, and Invasive species leading to decreased forest.

4.5 **Recommendation to conserve the plant species in the forest.**

Present study on anthropogenic pressures in Jalotra, Joita, Pavathi, Dhori reserve areas show that many plant species are threatened so I recommend the forest department to protect the area as early as possible and restricted any kind of activities

Teams of taxonomists/ Para taxonomists have to constantly monitor, evaluate and analyze the impact of NWFP plant collection. Periodic regeneration surveys, harvest assessment, etc should be part of the monitoring programme.

Communities / groups may be given subsidies or encouragement for protecting/conserving an area or certain plants that are critically endangered.

Every school, Colleges & other education institutions, Government as well as private institutions should be encouraged to cultivate NWFP.

Database on the availability of NWFP & sustained conservation practices, of NWFP should be created. Indigenous knowledge of the tribal communities should be incorporated into such studies.

Training programmes for forest officials should be developed for identification and conservation of threatened plants. NGOs involved in conservation should be made associates of conservation initiatives. Financial and technical support should be given for establishment of regional gene banks, caryobanks and tissue culture repositories.

**Chapter – 5 : References :-**


Dabgar, P. J, Dabgar, Y. B and Jain, B. K. (2006) "Biological Spectrum of the vegetation of Balaram Sanctuary Banaskantha Dist (N. Guj)" Advance Bio Science, 2


GEC. 2003. *Rare and Endangered Plants and Animals of Gujarat*.


Joshi P. N. (1997) "*Flora of Kheralu *"


Santapau, H. 1962. ‘*Flora of Khandla*’.

Santapau, H. 1953-54. ‘*Contribution to the Botany of Dangs forest in Gujarat*’.


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