The book gives an overview of Waghai Botanical Garden (WBG) and its resources, Primarily the book deals with the thirty exclusive flowering trees of Waghai Botanical Garden with colorful plates, their scientific name, local name, distribution, phenology and uses. These are endemic or indigenous trees, introduced in the garden from various region of India viz., Western Ghats, North East Himalayas, Eastern Ghats, and from other tropical countries. The book also gives insight into the recent developments in the garden such as Dang e-herbaria, Floral safari (An Android-based application for Trees of WBG) and FLoral Diversity of WBG. The book also takes you into Journey of BOTANY FEST- An annual programme for the younger generation for popularization of Botany and its utility.

Dr. Padamnabhi Nagar is actively engaged from last twenty years in plant biodiversity study of Gujarat. Dr. Dheeraj Mittal, DCF, South Dang Forest Division, Dangs, is involved in conserving the biodiversity of South Gujarat and developing the Waghai Botanical Garden. Mr. Akash Vanzara is plant taxonomist working on legumes of Central Gujarat

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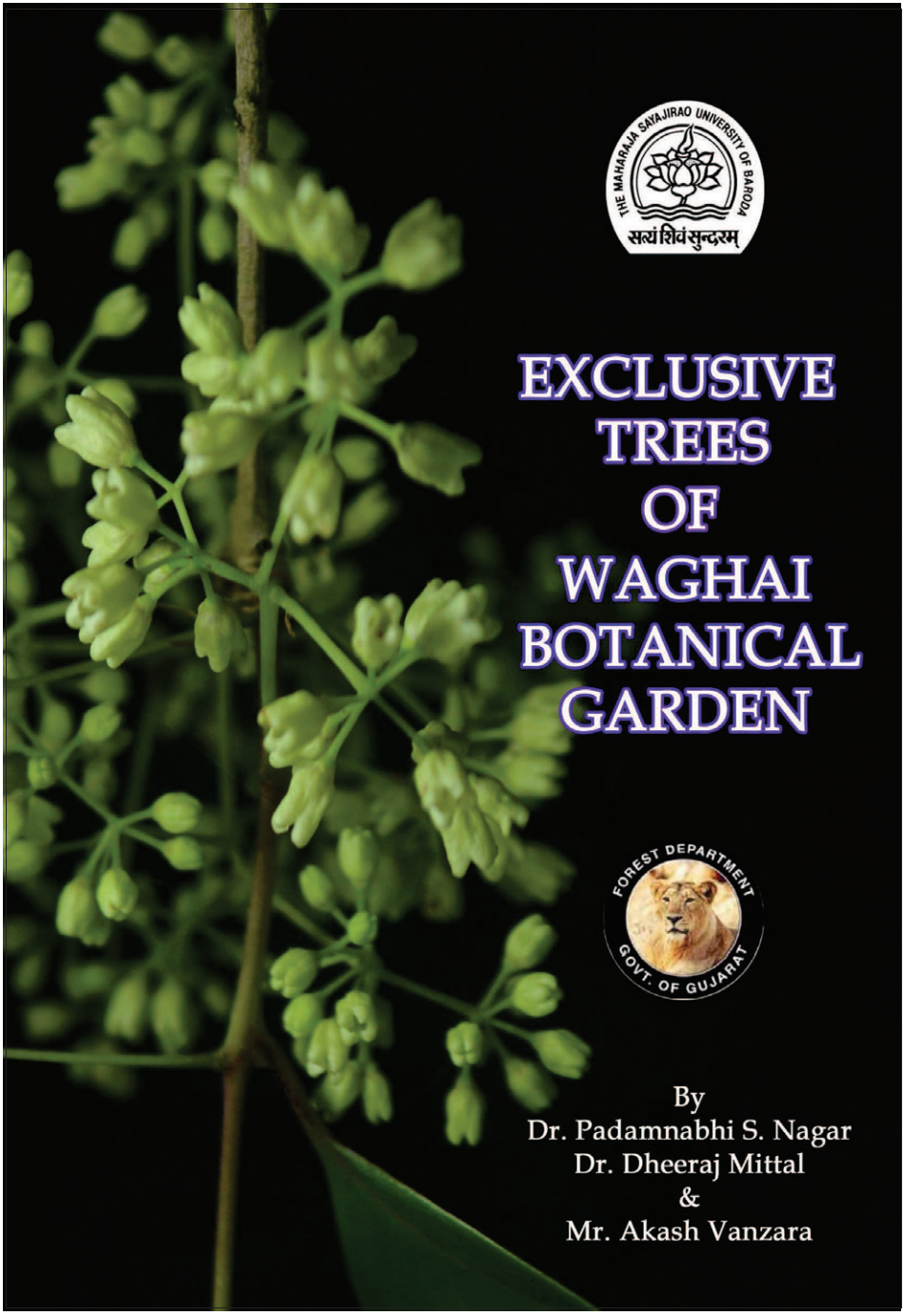

EXCLUSIVE TREES OF WAGHAI BOTANICAL GARDEN

By
Dr. Padamnabhi S. Nagar
Dr. Dheeraj Mittal
&
Mr. Akash Vanzara

EXCLUSIVE TREES OF WAGHAI BOTANICAL GARDEN

Principal contributor: Dr. Padamnabhi. S. Nagar, Dr. Dheeraj Mittal, Mr. AkashVanzara

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Photographs: Dr. Padamnabhi. S. Nagar
Mr. AkashVanzara
Mr. Karan Rana
Mr. Mital Bhatt
Mr. Ankur Rajwadi

FOREWORD

Waghai Botanical Gardens (WBG) was established in 1966, there after innumerable people have contributed substantially to bring the WBG to its present stage and I earnestly feel that still it has to go miles ahead in future. The progress had been multi-directional and fulfils different aspects like conservation of Biodiversity, sustainable use and education and research in the field of botany and forestry.

The book **"Exclusive Trees of Waghai Botanical Gardens"** is a step further in enhancing its utility not only to foresters, scientists and researchers, but to all those people, who all are fascinating about plants and want to achieve some insight and awareness. It is amazing to witness the stupendous efforts put forth by the authors to include all relevant information on the trees growing in the Garden and also to the herbarium specimens which are deposited at the Garden's Herbarium.

Besides to the botanical aspects, authors had also incorporated all the information about map, location, layout and the latest development of the garden like the establishment of Orchid House in the garden.

I must appreciate the step towards the concept of preparing Dang's *e-Herbarium* and the beginning of an android based software application *"Floral Safari"* programme and which is the online information of all the trees species of WBG.

My heartfelt congratulations are due to all those who have passed through this painful process, their hard work and efforts have gifted me with the most valuable souvenir depicting my own life time work of developing this garden at some point of recent past. This book is the most ever handbook for all, who cares for the plants and are curious enough to know the plants with their names.

My heartiest congratulation is due to Dr. P. S. Nagar, Dr. Dheeraj Mittal and Mr. Akash Vanzara and the whole team of The Maharaja Sayajirao University of Baroda for making this a reality.

Dr. Bharat G. Vashi
Former Prof. of Forestry
ASPEE College of Horticulture and Forestry
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Navsari, Gujarat, India

PREFACE

Botanical gardens are important centers for education. There are 1600 botanical gardens in the world which, between them, maintain the largest collection of plant species outside nature. As many as 60000 of these plant species may be threatened with genetic impoverishment or even extinction within the next 30-40 years. Threats include factors such as habitat loss and fragmentation, invasive species, over-exploitation of plant and animal species, pollution of soil, water and atmosphere, global climate change, industry, agriculture and forestry.

Botanical gardens have an obvious and vital role to play in conserving plants but conservation cannot succeed without education. Gardens are uniquely placed to teach people about the importance of the plants in our lives and in the global ecosystem. In the above context the booklet deals with some of the most unique flowering trees, scandent shrub of Waghai Botanical Garden, Gujarat. Waghai Botanical Garden is the largest garden of Gujarat spread in an area of **24 Hectares**. The Garden has been divided into different plots, which represent the various forest types occurring in India as classified by Champion and Seth. Various trees have been introduced in the Garden, from various biogeographical zones of India and from other tropical countries. The booklet is first of its kind which gives insight into the unexplored plants of Waghai Botanical Garden, of which some of them has been not even incorporated in the Flora of Gujarat too. The information in the book will definitely ignite the interest of among researchers, foresters and environmentalist.

An effort has been made to give a brief account on Waghai Botanical garden and a colorful journey into the exclusive trees of the garden. The information on plants given in the book gives insight into their common/local names, origin, distribution, uses and phenology. It aims to serve those who wish to learn about exclusive trees of Gujarat.

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ACKNOWLEDGMENT

At the foremost we would like to give tribute to all those unknown foresters and researchers who have contributed to the real treasure of Waghai Botanical Botanical Garden since its inception. We are highly thankful to the Vice-Chancellor and Registrar of The Maharaja Sayajirao University Vadodara, for taking interest in plant diversity awareness and providing necessary permission for the research work. Authors are also thankful to Prof. G. Sandhya Kiran, Head, Department of Botany, Faculty of Science, The Maharaja Sayajirao University Vadodara, for providing the necessary assistance and research lab facilities.

Authors are also highly thankful to Shri. M. J. Parmar, (IFS) Chief Conservator of Forests, Valsad Circle, for their kind support, valuable suggestions, and necessary assistance to work out on the trees of Waghai Botanical Garden. Authors are also highly thankful Retd. Prof. B. G. Vashi Botanist, Botanical Garden, Waghai (Dangs) (1973-1980) for giving his value able inputs, Authors are thankful to Late Mr. J. V. Aras (IFS) ACF Botanical Garden Waghai during (1973-1978) without his hard work and pain taking knees Garden would not be able to stand upon. We would like to thank Late Mr. Gangaram who has taken care about all the plant species which were laid in the garden during that period. Our thanks are due to Late Mr V. P. Gosavi, Forester of the Garden during (1971-1979) the real artist and sculpturist of the garden. Thanks are due to Retd. Prof. Minoo Parabia for sharing his valuable knowledge and observations on exclusive trees of WBG. Thanks are due to Mr. Pratik Pandya, Mr. Dinesh Rabari, Mr. Kiran Patel, forest guides Mr. Lasu and Kasu bhai and other staff of Waghai Botanical Garden (WBG) who went updating us with the latest information on the plants flowering in the WBG. Authors are thankful to Mr. Karan Rana, Ms. Mittal Bhatt, Mr. Roshan Parmar, and Mr. Paresh Patil, who have contributed immensely for the identification of various plant species. Authors would like to thank Mr. Ilesh Katara, Mr. Ravi Patel, Mr. Ronak Kachiyapatel, Mr. Amit Gondaliya, Ms. Mannu Diwedi, Ms. Kalpana Pal and other research scholars who have helped us and support for compilation the book. Thanks are due to Dr. Kishore Rajput, Dr. Dharmendra Shah, Prof. Vinay Raole and Dr. Rinku Desai for unconditional support. We are also thankful to all Forest Officials of Gujarat and to the local guide for sharing their valuable field knowledge.

Dr. Padamnabhi S. Nagar
Dr. Dheeraj Mittal (IFS)
Mr. AkashVanzara

CONTENTS

Abbreviations:

IFS- Indian Forest Service

ACF- Assistant Conservator of Forest

Prof- Professor

Retd- Retired

WBG- Waghai Botanical Garden

CBD- Conservation on Biological Diversity

MDGs- Millennium Development Goals

°C- Degree Celsius

Lat- Latitude

Long- Longitude

Fl- Flowering

Fr- Fruiting

E. Asia- East Asia

Introduction

Botanical gardens basically are place of collection cultivation and display of floral diversity. Over a period of time botanical garden have been established as institutions expanding their roles for the purpose of education and research, conservation, sustainable use, tourism and recreational activities and production on of plant based products. Botanical garden developed and flourished through a long tradition of exchanging, studying, displaying and conserving plants from around the world. They have served as places of serenity and wonder and centers of medical and taxonomic research. Botanical garden has also played a center role in the historical distribution of useful plants worldwide. In current scenario as plant species worldwide are declining due to a potent mixture of threats –habitat degeneration and loss invasive alien species, overexploitation, pollution and climate change *ex situ* conservation is becoming a vital rationale for existing botanical gardens and the further development of new botanical garden.

Today, individual botanical gardens place varying emphases on local or global plant diversity, public education and horticulture, *in situ* conservation initiatives, *ex situ* conservation techniques and investigation of new environmentally sustainable uses of plants. All of these activities fall within the scope of the United Nations Convention on Biological Diversity (CBD), an international framework convention that has led to the development of many new national laws, policies and initiative around the world. Botanical gardens provide important bridges between the researcher and conservationist, government authorities, local communities and pharmaceutical industries. These links are valuable to society, need to be recognized and considered.

Botanical garden exchanging plant material across regional boundaries require a good understanding of the many, sometimes contentious issues that surround access to genetic resources and the sharing of benefits derived from their use, including the concept of prior informed consent and fair and equitable benefits-sharing, The CBD approach-stressing benefits-sharing, scientific and technical cooperation and technology transfer-relies on partnership and communication between providers and users of biodiversity; gardens can provide many inspiring examples of successful partnership, and should continue to create more. Botanical gardens also need to demonstrate to government how vital their contributions are towards implementation of the CBD's objectives. It is crucial that botanical gardens understand the legal, social and ethical implications of this global treaty to continue their work constructively and reputably. Further, there is need to establish the Botanical gardens as gene pool centers

Human beings depend on biodiversity for survival, and its protection and sustainable management is central to the achievement of the Millennium Development Goals (MDGs). The MDGs focus on poverty alleviation, health and sanitation, education, equity and sustainability; no single MDG explicitly addresses biodiversity, but healthy, functioning ecosystems, sustainable food production system and rich genetic resources for medicines are essential to achieve the goals. As the primary international instrument covering the conservation and sustainable use of biodiversity, the CBD provides a framework for action at all levels, and it aids botanical gardens to situate their work in the broader development context.

CBD cross-cutting issues: most relevant to botanical gardens

2010 Biodiversity Target

- Access to genetic resources and benefit-sharing
- Climate change and biodiversity
- Communication , education and public awareness
- Economics, trade and incentive measures
- Ecosystem approach
- Global strategy for plant conservation
- Global taxonomy initiative
- Identification, monitoring, indicators and assessment
- Impact assessment
- Invasive alien species
- Liability and redress
- Protected areas
- Sustainable use of biodiversity
- Tourism and biodiversity
- Traditional knowledge, innovations and practices
- Technology transfer and cooperation

Waghai Botanical Garden (WBG)

Waghai Botanical Garden was established by the Forest department in 1966. WBG is situated near about 2 Km from Waghai on Waghai-Saputara Road in Dangs District, Gujarat. It is largest garden in Gujarat spreads over an area of 24 Hectares. Waghai Botanical Garden has a systematic network of roads with a stretch of 7 Km in length. The climate detail of WBG includes, average rainfall between 1600 mm to 2000 mm; average minimum temperature is of 10 °C (December, January) and maximum temperatures goes up to 45 °C (June, July) has been recorded.

The Waghai Botanical Garden is divided into 12 different plots, which represent all forest types occurring in India as classified by Champion and Seth as shown in Figure 1.

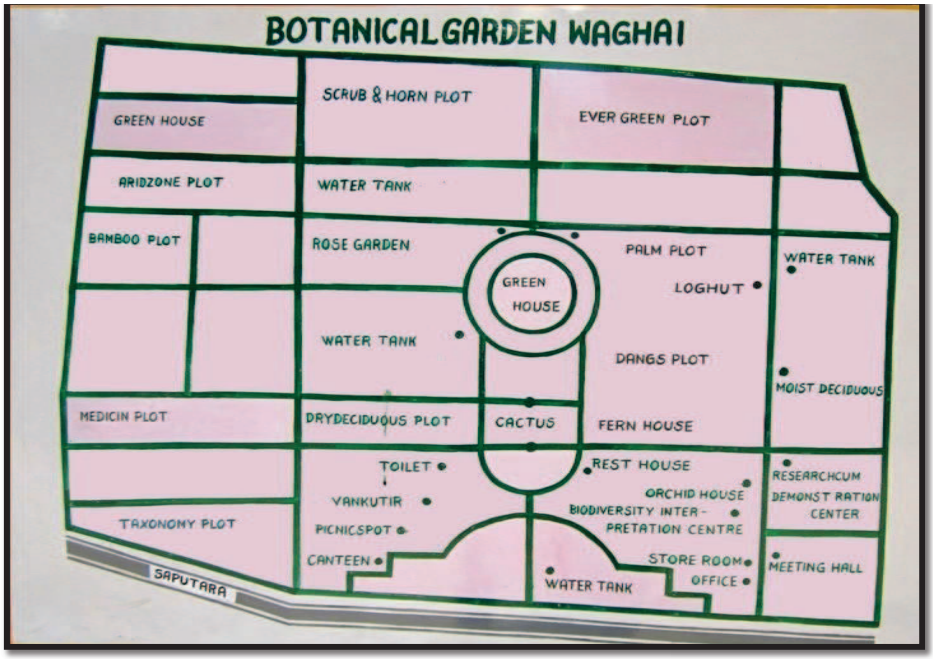


Figure 1: Map of different plots in Waghai Botanical Garden

1) **Evergreen Plot:**
   Evergreen plot is a mimic of forest type observed in Southern and North Eastern part of India. This plot has more than 328 plant species which includes plants like *Callophylum*, *Mesua*, *Artocarpus heterophyllus*, *Duabanga grandiflora* etc.

2) **Moist Deciduous Plot:**
   The plot is prepared by considering forest species available in the Southern Western Ghats, North India and Andaman & Nicobar Island. It has more than 323 plant species such as *Largerstromia indica*, *Shorea robusta*, *Dillenia indica*, *Albizia procera* etc.

3) **Dry Deciduous Plot:**
   Dry Deciduous plot has vegetation similar to that of forest type of Madhya Pradesh, Gujarat, Andra Pradesh, Karnataka, Tamilnadu, and Punjab which comprises of more than 42 species. The representative species in such forest type are *Terninalia arjuna*, *Anogeissu latifolia*, *Diosphyros montana*, *Semicarpus anacardium*, etc.

4) **Scrub and Thorn Plot:**
This plot includes plants found in forest of Madhya Pradesh, Maharashtra, Andhra Pradesh and Rajasthan. This plot represents 101 plant species few examples are *Acacia pinnata*, *Zizyphus mauritiana* etc.

5) **Arid Zone Plot:**
The plot comprised of environment than that of arid zone of India as found in North Gujarat and Rajasthan. More than 114 plant species of the respective forest types were planted in this plot. The vegetation of the plot includes species like *Cappris zeylanica*, *Tamrix indica*, *Opuntia ficus-indica* and some perennial grasses.

6) **Taxonomy Plot:**
The plot was developed for the identification, nomenclature and classification of plant kingdom. The significance of the plot is to provide insight details of the complexity in plant diversity with the help of many plant species herbaria present in the WBG.

7) **Medicinal Plot:**
This plot was added to the garden in subsequent years of its formation. It has collection of 257 species which have medicinal usages in Ayurveda, Unani, Siddha, Homeopathy and modern medicines.

8) **Bamboo Plot:**
The plot comprised of 6 bamboo species found in different regions of India, such as *Bamboosa tuldodies, Bamboosa vulgaris* etc.

9) **Dangs Plot:**
This plot represents the species occurring in Dang forest. It has more than 468 species.

10) **Cacti and Succulent Plot:**
Cacti and succulents have always attracted people across world. The plot includes 142 different varieties of Cacti and Succulents.

11) **Research and Demonstration Center:**
WBG has Library of 552 books which includes books on different Flora, Horticulture, Floriculture, Agriculture and the published forest reports.

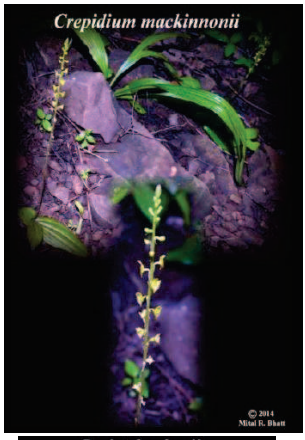
RECENT DEVELOPMENTS AT WAGHAI BOTANICAL GARDEN

ORCHID PLOT

Orchids are the most highly evolved flowering plants which exhibits an incredible range of diversity in size, shape and color of their stunning flowers. In this plot 19 species of orchids have been conserved of which 9 are epiphyte and 10 are terrestrial.

Figure: 2. Diversity of Orchids in Waghai Botanical Garden (Picture courtesy: Mital Bhatt)

Conservation of different wild orchid species in Waghai Botanical Garden



Conservation of different wild orchid species in Waghai Botanical Garden

DANG E-HERBAIUM (www.waghaibotanicalgarden**):**

It is a unique electronic herbaria having collection of Dr. R. I. Patel - An eminent Taxonomist of Gujarat. There are 3644 plant specimens belonging to 3245 Dicot, 399 Monocot and 2 Pteridophytes. The collection is mainly of Dr. B. G. Vashi, Dr. J. R. Parmar and Mr. K. L. Dubey. This is a useful reference website for Students, Research scholars, Forest Guards, Forest officials, Herbalist, Ayurvedacharya, Environmentalist visiting Garden.

Figure: 3. Dangs e-herbaria webpage

Figure: 4. Dangs e-herbaria web search page

Highlights of E-Herbaria:

- All the plant specimens are well arranged in alphabetical manner based on their family along with their other taxonomical details, which commences from Acanthaceae Family and ends up with Zingiberaceae family.
- The website contains all the necessary information about any plant starting from its botanical name, their family, its English name subspecies, variety name, and local names, also the time of flowering and fruiting, with some general information about the plant.
- Herbarium images are of high resolution with zoom facility to observe the minute morphological details of respective plant species for example their leaf margin, apex, stem striation, and hairs if present.
- The website also provides information regarding plants site of locations or collection site, collector's name, date of the collection and some of the key specific information about its taxonomic identification.

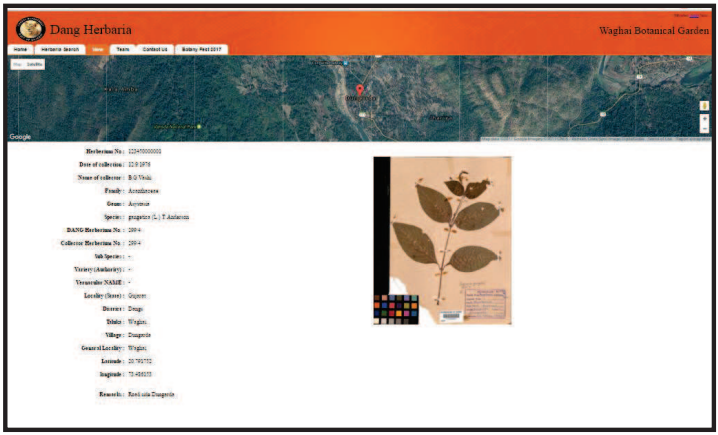


Figure: 5. Digital herbarium

This herbarium website was officially launched by Shri. S. M Patel (IFS), Chief Conservator of Forest, Valsad Circle, during the Botany Fest 2017.

Figure: 6. Launching of e-herbaria

FLORAL SAFARI

Floral safari is an android based programme for the trees of Waghai Botanical Garden. The application provides information on the scientific details of plant i.e. local name, family, origin, meaning of scientific names, phenology, and medicinal and consumable uses.

All together details of 274 plant species are tagged in WBG of which 242 plants are dicots and 32 plants are monocots.

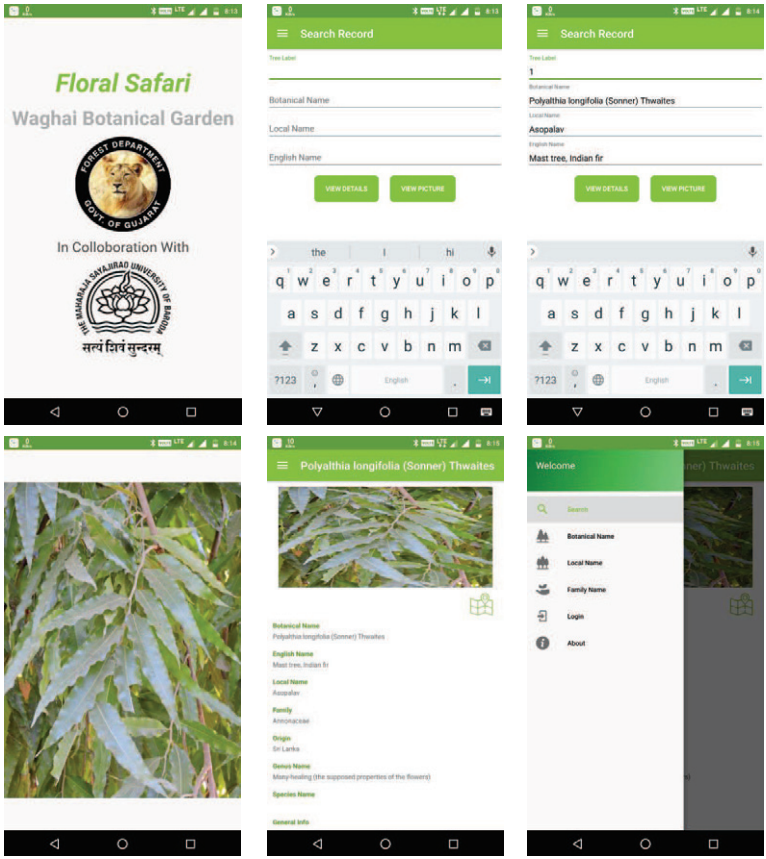


Figure: 7. Android based application

Benefits of the software

1. Awareness about common, rare, endangered and threatened trees.
2. Practical way for identification of plant species.
3. Indigenous plant diversity is studied in field.
4. Why trees should be conserved?
5. Understanding the canopy and bark ornamentation.
6. To study the morphological variation with respect to time prevailing in the plants.
7. Aesthetic values of different trees.
8. Medicinal uses of trees.
9. Description on the seeds of different trees and to differentiate them from every species point of view.
10. Trees usefulness for landscape planning.

FLORISTIC DIVERSITY OF DANGS

Waghai Botanical Garden is rich in floristic diversity having wide varieties of plant species. In order to understand the diversity of WBG a project on **Floristic diversity of Waghai Botanical Garden** was taken up for study in August 2017**.** Till now 450 different plant species have been collected and have been uploaded on Dangs e-herbaria (webpage www.waghaibotanicalgarden).

Figure: 8. Floristic diversity of Waghai Botanical Garden

EXCLUSIVE TREES OF WAGHAI BOTANICAL GARDEN

Duabanga grandiflora **(DC.) Walp. [Lyhraceae]**

Common name	: Duabanga
Local name	: Duvalbangal
Plant Growth Form	: Tree
Distribution	: East Asia - southern China, India, Myanmar, Malaysia, Laos, Thailand, Cambodia, Vietnam
Lat. - Long.	
Location in WBG	: 20° 45.269'N, 73° 29.835'E
Uses	: Evergreen Plot
	: Actively used for skin cells such as skin whitening, anti-aging and anti-inflammation. Fruit's very acidic in nature, it can be made into a refreshing drink, and it is boiled used as a vegetable. It is having antiviral and virucidal activities.
Fl. – Fr.	: December – April

Hopea ponga **(Dennst.) Mabb. [Moraceae]**

Common name	: Ponga
Local name	: Kavshi
Plant Growth Form	: Tree
Range	: India (endemic)
Lat. - Long.	: 20° 45.263'N, 73° 29.844'E
Location in WBG	: Evergreen Plot
Uses	: Bark and seed wings having antioxidant and antibacterial activity. Wood is very good source of timber products.
Fl. – Fr.	: October – March

Uvaria littoralis (Blume) Blume [Annonaceae]	
Common name	: South-Indian Uvaria
Local name	: Uvaria
Plant Growth Form	: Climber, Vine & Liana, Shrub (Woody)
Distribution	: South east Asia.
Lat. - Long.	: 20° 45.289'N, 73° 30.004'E
Location in WBG	: Western Ghat Plot
Uses	: Leaves, stem and barks is very good source of essential oils. The stems can be used like rope
Fl. – Fr.	: November – February

Olea dioica Roxb. **[Oleaceae]**

Common name	: Rose Sandalwood
Local name	: Parjamb
Plant Growth Form	: Tree
Distribution	: East Asia, Australia, Pacific.
Lat. - Long.	: 20° 45.126'N, 73° 29.786'E
Location in WBG	: Gandhi road
Uses	: A timber tree with seeds rich in oil with high concentration of oleic acid, it is used in hypotency (reducing blood pressure) and as antioxidant too.
Fl. – Fr.	: October – March

Parmentiera cereifera **Seem. [Bignonaceae]**

Common name	: Candle Tree
Local name	: Pencil Tree
Plant Growth Form	: Tree
Distribution	: Central America
Lat. - Long.	: 20° 45.284'N, 73° 30.020'E
Location in WBG	: Western Ghat Plot
Uses	: Stem and leaves are having antioxidant, anti-inflammatory, skin-lightening, moisturizing effects. Fruits also have antidiarrhoeal, anticancer and antiasthmatic properties.
Fl. – Fr.	: October – March

Cleistanthus collinus **(Roxb.) Benth. ex Hook.f. [Phyllanthaceae]**

Common name	: Garari
Local name	: Garari
Plant Growth Form	: Tree
Distribution	: Asia
Lat. - Long.	: 20.755356, 73.499342
Location in WBG	: Putranjva Road
Uses	: Oil from the seeds are used in rheumatic treatment, cleistanthin present in leaf, which is used as antioxidant
Fl. – Fr.	: October - December.

Glochidion ellipticum **Wight [Phyllanthaceae]**

Common name	: Bhoma
Local name	: Bhoma
Plant Growth Form	: Tree
Distribution	: Asia
Lat. - Long.	: 20.754740, 73.500351
Location in WBG	: Western Ghat Plot
Uses	: Used in alimentary disorders and skin problems. Rich in ascorbic acid, used in anti-cancer, hypotensive and diuretic properties.
Fl. – Fr.	: October – January

Ficus microcarpa **L.f. [Moraceae]**

Common name	: Laurel Fig, Chinese Banyan, Curtain fig
Local name	: Pragvad, NandrakVad
Plant Growth Form	: Tree
Distribution	: South-eastern Asia and Oceania
Lat. - Long.	: 20.754278, 73.497771
Location in WBG	: Near Evergreen Plot
Uses	: The bark and leaves are used in wounds, ulcers, bruises, flatulent colic, hepatopathy, diarrhea, dysentery, diabetes, hyperdipsia, burning sensation, hemorrhages, erysipelas, dropsy, ulcerative stomatitis, hemoptysis, psychopathy, leucorrhoea and vaginal hemorrhage.
Fl. – Fr.	: March – June

Antidesma acidum **Retz. [Moraceae]**	
Common name	**:** Black Currant Tree
Local name	**:** Aamri, Dhakki, Khatua
Plant Growth Form	**:** Shrub
Distribution	**:** Southeast Asia
Lat. - Long.	: 20.754759, 73.500311
Location in WBG	**:** Western Ghat Plot
Uses	**:** The leaves and the roots are used in the treatment of dysentery and bile complaints various parts of the plant are used in the treatment of dropsy, muscular pains, pneumonia.
Fl. – Fr.	**:** March – June

Antidesma ghaesembilla **Gaertn. [Phyllanthaceae]**	
Common name	**:** Black Currant Tree
Local name	**:** Aamri, Dhakki, Khatua
Plant Growth Form	**:** Shrub
Distribution	**:** E. Asia - southern China, Indian subcontinent, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, Indonesia, Philippines, New Guinea, Australia
Lat. - Long.	: 20.755239, 73.499896
Location in WBG	**:** Ragat rohida road
Uses	**:** The leaves are used as a poultice to treat headaches, scurf, abdominal swellings and fevers, stems are emmenagogue, fruit is purgative.
Fl. – Fr.	**:** March – January

Ardisia solanacea **(Poir.) Roxb. [Primulaceae]**	
Common name	**:** Shoebutton Ardisia, Duck's eye
Local name	**:** Bugdi, Dikna
Plant Growth Form	**:** Shrub
Distribution	**:** East Asia
Lat. - Long.	: 20.754759, 73.500311
Location in WBG	**:** Western Ghat Plot
Uses	**:** The juice of the root is used to relieve indigestion; plant possesses stimulant and carminative properties. Roots are febrifuge; used in diarrhoea and rheumatism. Root-bark boiled water is used to wash sores and paste of root bark is applied to heal sores.
Fl. – Fr.	**:** March – January

Carallia brachiata **(Lour.) Merr. [Rhizophoraceae]**	
Common name	: Freshwater Mangrove
Origin	: India, Sri Lanka, China, Malay Archipelago, Australia
Plant Growth Form	: Tree
Distribution	: Madagascar to tropical Asia and northern Australia.
Lat. - Long.	: 20.754254, 73.497548
Location in WBG	: Ever Green Plot
Uses	: The juice from the macerated leaves is used in the treatment of fevers. The pulverized bark is rubbed on the body in the treatment of smallpox. The leaves and bark are used in local medicine to treat septic poisoning and itch.
Fl. – Fr.	: October – February

Chloroxylon swietenia **DC. [Rutaceae]**	
Common name	: East Indian Satinwood
Local name	: Behru, Halda
Plant Growth Form	: Tree
Distribution	: India, Sri Lanka, South East Asia
Lat. - Long.	: 20.754810, 73.499780
Location in WBG	: Evergreen Plot
Uses	: The crushed leaves are applied to treat wounds, snakebites and rheumatism. A bark extract is considered astringent and taken to treat fever, chest pain and in a mixture with other plants to treat asthma
Fl. – Fr.	: January – April

Diospyros malabarica **(Desr.) Kostel. [Ebenaceae]**	
Common name	: Gaub, Malabar Ebony, Indian persimmon
Local name	: Timburi
Plant Growth Form	: Tree
Distribution	: India, Sri Lanka, Nepal, Thailand, Myanmar, Sumatra, Java, Timor, Celebes, Malaysia
Lat. - Long.	: 20.754746, 73.500422
Location in WBG	: Western Ghat Plot
Uses	: Fruit posses anti-bacterial and anthelmintic activity. It is used externally to heal sores and wounds; the fruit is beneficial in treating diarrhoea and dysentery; blood diseases; gonorrhoea and leprosy.
Fl. – Fr.	: March – May

Elaeocarpus sphaericus **Gaertn. K. Schum. [Elaeocarpaceae]**	
Common name	**:** Bead tree
Local name	**:** Rudraksh
Plant Growth Form	**:** Tree
Distribution	**:** India, Myanmar, Nepal, Bangladesh, Malaya
Lat. - Long.	: 20.754282, 73.499726
Location in WBG	**:** Near to the Cactus house
Uses	**:** It is an immune-modulator. It is used in adjuvant therapy for breathing disorders and chronic cough. It assists in faster recovery during liver disorders and abdominal diseases. It is good remedy for controlling epilepsy.
Fl. – Fr.	**:** May-June; November-December

Erinocarpus nimmonii **J. Graham [Malvaceae]**	
Common name	**:** Jangli Bhendi, Nimmo's Erinocarpus
Local name	**:** KadviBhindi, JangliBhindi
Distribution	**:** Endemic to India
Plant Growth Form	: Tree
Lat. - Long.	**:** 20.755125, 73.499686
Location in WBG	**:** Ragat rohida Road
Uses	**:** The bark is used for making the ropes.
Fl. – Fr.	**:** August – September

Falconeria insignis **Royle [Euphorbiaceae]**	
Common name	**:** Tiger's Milk Spruce, Chinese Tallow
Local name	**:** Sherod
Plant Growth Form	**:** Tree
Distribution	**:** India, Sri Lanka, Nepal, Bhutan, Bangladesh, Myanmar, South West China, Laos, Cambodia, Vietnam, Thailand, Malaysia
Lat. - Long.	: 20.754651, 73.499460
Location in WBG	**:** Dang Plot
Uses	**:** Wood very soft and spongy, suitable for floats, packing-cases, toys, drums, sandals and matchboxes. Milky juice acrid and vesicant used for fish poison.
Fl. – Fr.	**:** December – May

Vitex altissima **L.f. [Lamiaceae]**	
Common name	**:** Peacock chaste tree
Local name	**:** Nagod ni jat
Plant Growth Form	**:** Tree
Distribution	**:** E. Asia - Indian subcontinent, Laos, Indonesia, Papua New Guinea
Lat. - Long.	: 20.755712, 73.500148
Location in WBG	**:** Near to the herbarium room
Uses	**:** Bark is used as a fomentation in treating rheumatic swellings,
Fl. – Fr.	**:** March – April

Chukrasia tabularis **A.Juss. [Meliaceae]**	
Common name	**:** Chittagong Wood, Indian Redwood
Local name	**:** Toon ni jat
Plant Growth Form	**:** Tree
Distribution	**:** India, Indo-China & Malay Peninsula.
Lat. - Long.	: 20.755712, 73.500148
Location in WBG	**:** Near to the herbarium room
Uses	**:** Bark extract has powerful astringent properties and is used as a febrifuge and to treat diarrhoea,
Fl. – Fr.	**:** July – October

Artocarpus hirsutus **Lam. [Moraceae]**	
Common name	**:** Chittagong Wood, Indian Redwood
Local name	**:** Wild Jackfrui
Plant Growth Form	**:** Tree
Distribution	**:** E. Asia - southern India..
Lat. - Long.	: 20.754309, 73.496949
Location in WBG	**:** Evergreen plot
Uses	**:** A valuable timber, it is used for house and boat building, furniture, etc.
Fl. – Fr.	**:** July – October

Memecylon umbellatum **Burm. f. [Melastomataceae]**	
Common name	**:** Delek air tree, Ironwood tree
Local name	**:** Kaya
Plant Growth Form	**:** Tree
Distribution	**:** India, Sri Lanka
Lat. - Long.	: 20.754384, 73.497395
Location in WBG	**:** Evergreen Plot
Uses	**:** The leaves are astringent. They are used internally in the treatment of gonorrhea and leucorrhoea it also make a cooling astringent wash and a lotion for treating conjunctivitis.
Fl. – Fr.	**:** March – April

Psydrax umbellata **(Wight) Bridson [Rubiaceae]**	
Common name	: Umbelled Canthium
Local name	: Arsul
Plant Growth Form	: Shrub
Distribution	: India, Nepal, China, Myanmar, Laos, Cambodia, Vietnam, Malaysia
Lat. - Long.	: 20.755118, 73.499856
Location in WBG	: Western Ghat Plot
Uses	: Young branches are used to make brooms.
Fl. – Fr.	: March – May

Vateria indica **L. [Dipterocarpaceae]**	
Common name	**:** The Piney Varnish Tree, The Indian Copal Tree, White Dhup
Local name	: Badasal
Plant Growth Form	**:** Tree
Distribution	: E. Asia - India
Lat. - Long.	**:** 20.754384, 73.497336
Location in WBG	**:** Evergreen Plot
Uses	**:** The resin obtained from the tree used in treating infected wounds, diarrhea, earache, intestinal worm. Oil obtained from the seeds is valued locally as an external application to relieve rheumatism.
Fl. – Fr.	**:** March – April

Wendlandia heynei (Schult.) Santapau& Merchant [Rubiaceae]	
Common name	: Heyne's Wendlandia
Local name	: Tilya
Distribution	: India, Nepal
Plant Growth Form	: Tree
Lat. - Long.	: 20.754384, 73.497395
Location in WBG	: Western Ghat Plot
Uses	: Fresh flower is grounded with milk; a cup of grounded mixture is taken orally from third day of menstrual period for abortion, also used for skin problems.
Fl. – Fr.	: March-April

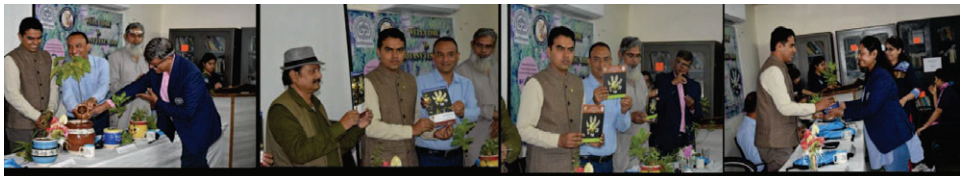
Holigarna arnottiana **Hook.f. [Anacardiaceae]**	
Common name	**:** Black Varnish Tree
Local name	**:** Ranbiba
Distribution	**:** India, Bangladesh and Indo-China
Plant Growth Form	**:** Tree
Lat. - Long.	: 20.754515, 73.496953
Location in WBG	**:** Evergreen Plot
Uses	**:** In ayurveda, the plant is believed to be helpful in treatment of inflammation, arthritis, hemorrhoids, obesity, tumor, cancer, and skin diseases..
Fl. – Fr.	**:** March-April

Shorea robusta **Gaertn [Dipterocarpaceae]**	
Common name	**:** Sal
Local name	**:** Sal
Distribution	**:** E. Asia - Indian subcontinent to south-western China
Plant Growth Form	**:** Tree
Lat. - Long.	: 20.754811, 73.499891
Location in WBG	**:** Western Ghat Plot
Uses	**:** Leaf juice is used in the treatment of dysentery. Oil from the seed is used to treat skin diseases.
Fl. – Fr.	**:** March-April

Croton tiglium L. [Euphorbiaceae]	
Common name	: Croton
Local name	: Croton
Distribution	: E. Asia - China, Indian subcontinent, Myanmar, Thailand, Cambodia, Vietnam, Malaysia, Indonesia, Philippines
Plant Growth Form	: Tree
Lat. - Long.	: 20.754968, 73.500246
Location in WBG	: Western Ghat Plot
Uses	: The seed and seed oil have long been used in tropical Asia as a strong purgative and cathartic. The leaves are used as a poultice to treat snakebites.
Fl. – Fr.	: March-April

Bischofia javanica **Blume. [Phyllanthaceae]**	
Common name	: Bishop Wood
Local name	: Bischofi
Distribution	: E. Asia - China, India, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, Australia and the south Pacific
Plant Growth Form	: Tree
Lat. - Long.	: 20.754763, 73.499959
Location in WBG	: Western Ghat Plot
Uses	: The plant has antiulcer, anthelmintic and antidysenteric activities. Fresh bark is used to treat aching stomachs
Fl. – Fr.	: March-April

Pterygota alata **(Roxb.) R.Br. [Malvaceae]**	
Common name	**:** Buddha Coconut
Local name	**:** Eastowood
Distribution	**:** E. Asia - southern China, India, Bhutan, Bangladesh, Myanmar, Thailand, Vietnam, Malaysia, Philippines
Plant Growth Form	**:** Tree
Lat. - Long.	: 20.753224, 73.499901
Location in WBG	**:** Eastwood Road
Uses	**:** Used as timber, it can be used for making boxes and toys.
Fl. – Fr.	**:** March-April



BOTANY FEST 2017-18

An Innovative way of learning
BOTANY in FOREST

The Waghai Botanical Garden has completed 50 years and with such a huge botanical treasure and having potential of being a knowledge center the authorities have taken one of its own kind initiatives in the form of Botany Fest. The objective of the event was to give a platform to persons interested in botanical knowledge and information viz. students, researchers, teachers, and faculties from different parts of Gujarat to share information, knowledge and experiences. The event was having exiting activities to achieve the above mentioned objectives. The first Botany Fest of Gujarat was organized by South Dang Forest Division in collaboration with The Maharaja Sayajirao University Vadodara at Waghai Botanical Garden 2017, in which there was a grand blend of events such as:

- *Phyto Hunt, (*Memory Game)



- *KudratKaKhajana* (Plant Craft),




- *Mahek Hamari Pehchan Tumhari* (Identification of plants with their natural smells)



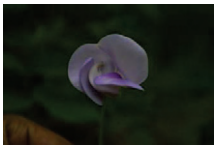
- *Botany Ki Loksabha* (Parliament of Botany)



- *Kaun Banega Best Botanist* (KBBC)



❖ *Hulund Mata Ki Kahani* (unique story of plant conservation)


❖ *Plant For The Planet* (Rare and endangered tree plantation).



Fest was organized on Feb, 19-20, 2017 where students of 16 different colleges of Gujarat, participated and demonstrated their talents in the field of Botany. During the fest, E-Herbaria (Digitalization of Dang herbaria) and Floral Safari (Android base application for identification of plants of Waghai Botanical Garden) was officially launched. The winners of various events felicitated with trophies.


With huge success of Botany Fest 2017, and with lots of appreciation from the participants of different colleges and faculties, the organizing committee has decided to take a step further to make this event a national level event. In Botany Fest 2018, 18 colleges participated. In 2018 the blend of events was even more exiting viz:

- *Phyto Hunt* (finding of the different plants with given clues)

- *Bhujo To Jane* (tag the State/National/World Trees)

❖ *Mahek Hamari Pehchan Tumhari* (Identification of plants with their natural smells)



❖ *Chef of Botany* (collecting plants from natural resources and making food in natural way)



❖ *PushpaSheraz* (to perform an act on plant morphology, without speaking)


❖ *Enlightenment under Pragvad* (story of an ancient Indian tree Pragvad)

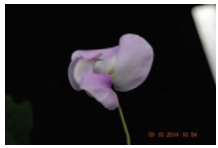


❖ *NagmePhool Ki YadoKe* (identification of different plants by rhythms of songs, and video)


❖ *KudratKaKhajana* (plant craft)


❖ *PrakrutiKi Loksabha* (Parliament of Botany)

❖ *Hulund- An Untold Story* (Documentary on sacred plant of Dangs i.e. *Vigna vexilata*)



❖ *Plant for the Planet* (rare and endangered tree plantation)

Apart from these activities there were presentations by experts during night hours. Dr. Rinku Desai made presentation on Ghas Ke Ghere Raz- (awareness and uses of

grasses and sedges in Gujarat) and second presentation was on Eternal World of Plants (anatomy of different lianas and climbers) by Dr. Kishore S. Rajput.

The fest was followed by National Conference on Plant Biodiversity and Conservation organized by The Maharaja Sayajirao University Vadodara, in collaboration with Gujarat Ecological Commission and South Dang Forest Division Ahwa, Dangs. Wherein all the botany allies were together *viz*., Botany, Forestry, Ayurveda and Agriculture. Concerning to the current issues in the field, most of the dignitaries delivered there lectures on different topics *viz.* "Alien invasive plants of India"- by Dr. Sudhakar Reddy NRSC, Hyderabad, "Gingers: Sustainable utilisation & conservation" by Dr. Ramesh Kumar Paliwal, BSI, Jodhpur, Rajasthan, "Climbing Plants Of Gujarat & Their Conservation In Valsad District" by Dr. Sandip Kumar, S.P University, Vallabh Vidyanagar, "Plants Used In Musical Instruments By Indigenous People" by Dr. Vinod Maina, Joint Director, BSI, Jodhpur, Rajasthan.

In the end of the event, an open forum was called in which all the dignitaries and the research scholars were given time to express their views and share their field knowledge to the audience

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