

# Bio prospecting of the local wild edible varieties to address the issue of malnourishment in Palghar district

Prepared for  
JSW Steel Ltd.





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# 1 Executive Summary

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Traditional knowledge should be documented and conserved as it has been proved to provide sustainable solutions to the local issues. The wild edible plants have been an integral source of nutrition for the tribal communities of Palghar district. They follow set of unique practices developed as a result of years of observations and trials and errors; which help them identify, consume and conserve these wild edibles. But it has been lately observed that this traditional knowledge is on a decline as a result of improper documentation and lack of interest by the younger generation to adopt the knowledge. This threat makes it important to conserve this traditional knowledge. Malnourishment is major issue pertaining in the tribal blocks of Palghar district, Maharashtra. TERI, through several interactions, recognized the need to put emphasis on generating local resources as a strategy and advocated a unique three pronged approach to develop sustainable solution. During the process of documenting traditional knowledge, TERI found a huge gap w.r.t to transfer and documentation of traditional knowledge which is important component in order to address malnourishment. Realising this TERI found that it is necessary to document, conserve and, scientifically validate the wild edible plant species which would help to address malnourishment in Maharashtra. TERI submitted the proposal to JSW on September 2014 and received a confirmation and LOI (Letter of Intent) on December 17, 2014 for the project "Bio prospecting of the local wild edible plant varieties to address the issue of malnourishment in Palghar district."

In Phase I of the project, information about more than 190 species of wild edibles which are used by the tribes for their dietary and medicinal purpose were documented. 27 samples of plant species were collected and preserved. Almost 17 (60%) of the collected samples were found to be used for dietary purpose while 7 (25%) of the species are used for medicinal purposes. 4 (15%) of the collected species were used for both the purposes, dietary as well as medicinal. A comparative analysis was also undertaken in which the perception of villagers about the use of a particular species was compared with the published scientific literature.

Phase II of the project dealt with scientific validation of the species documented in Phase I, development of digital library on wild edibles and a plant nursery to deal with the issue of knowledge and propagule access. Around 160 species of wild plants, out of which 73% species were used for consumption while 15% species were used for medicinal purposes and 12% species were used for food as well as medicinal purposes, utilized by the tribes was documented and scientifically validated through extensive review of literature, field surveys such as transect walks and quadrat surveys, interactions and nutritional analysis. The nutritional analysis was conducted for 7 species of plants namely *Eleusine coracana*, *Ariopsis peltata*, *Justicia procumbens*, *Athyrium hohenackerianum*, *Leea macrophylla*, *Dioscorea wallichii* and *Schrebera swietenoides*. Important nutritional parameters such as carbohydrates, proteins, fats, vitamin, micro-nutrients and so on were identified through the nutritional analysis.

Further, to comprehensively compile, ensure effective conservation of traditional knowledge and increase the accessibility, a digital library of the wild plant species was developed. This would prove to be an important access point for the traditional information for various stakeholders such as NGOs, urban and rural dwellers, government agencies, scientists and students. All the stakeholders can easily access the information on wild edibles and use the knowledge towards mitigating the issue of malnourishment. A nursery has also been developed at the JSW Vashind Works, Vashind, Thane, Maharashtra with almost 70 species of wild plant species of nutritional and medicinal significance to the tribal communities. This

nursery shall help ensure conservation of germplasm and reduce the issue of access of availability of these plant species.

Thus the project shall not only help in reducing the knowledge gaps but also help the tribal communities to give them proper knowhow on the local wild plant resources which could be used to reduce the issue of malnourishment.



## 2 Introduction

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### 2.1 Background

Maharashtra has 27 tribal blocks<sup>1</sup> distributed across several topographical areas in the state. Of the total tribal population (11 lakhs)<sup>2</sup> in Maharashtra, almost 36.7% of children are underweight and 27% population is undernourished (2009)<sup>3</sup>. TERI, through its research, found that the issue of malnourishment is not just prevalent in the tribal areas but also in the urban areas. The reason for the same could be attributed to lack of proper awareness about nutrition, accessibility to nutritious food, choice of food and so on.

Given the above, TERI (The Energy and Resources Institute) and JSW (Jindal Steel Works) Ltd. both the institutions have been implementing independent projects in Palghar (then Thane) district, Maharashtra. JSW has been actively implementing projects in tribal areas of Palghar district specially Shahpur, Jawhar and Mokhada blocks through their CSR initiatives to address malnourishment, whereas TERI had been promoting the concept of nutri gardens and implementing sustainable solutions for enhancing access to resources among the tribal population of Wada block. After few preliminary discussions both organizations inspired with their common vision to eliminate malnourishment from tribal areas of Palghar district joined hands for addressing this issue.

TERI submitted the proposal to JSW in September 2014 for developing a prototype which would help document, conserve and scientifically validate this traditional knowledge. A confirmation and LOI (Letter of Intent) was received on December 17, 2014 for the project "Bio prospecting of the local wild edible plant varieties to address the issue of malnourishment in Palghar district." The program had been agreed to be implemented in two phases for duration of 1.5 years. Phase I was to be completed before March 15 and Phase II to be completed before March 2016.

### 2.2 Rationale

Palghar district of Maharashtra, located at the Western coast of India, is inhabited by tribal communities and they account to about 66 % of the state's population<sup>4</sup>. As directed by the Government of India in 1975-76, the villages in which the Tribal population accounted for more than 50% of the population<sup>5</sup>, were constituted into Integrated Tribal Development Projects (I.T.D.Ps)<sup>6</sup>. Accordingly, Palghar district is also regarded as one of the important Tribal Development Project Areas. Although the region is situated at a distance of mere 120 kms from the metropolitan Mumbai city, there is a high rate of malnourishment amongst women and children. Recently it has been reported that, almost 25.47% children are malnourished in age group 0-6 years enrolled in Anganwadis (Nursery schools) of Palghar district<sup>7</sup>. Also a whooping number of 177 children have died because of malnourishment in

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1 <http://tribal.nic.in/Content/ScheduledAreasinMaharashtraSSAreas.aspx>

2 <http://tribal.nic.in/WriteReadData/archiveDoc/201410170113319773837STProfileataGlance.pdf>

3 [http://www.sathichehat.org/uploads/PastProjects/Nutritional\\_Crisis\\_in\\_Maharashtra\\_Report.pdf](http://www.sathichehat.org/uploads/PastProjects/Nutritional_Crisis_in_Maharashtra_Report.pdf)

4 <http://collectorpalghar.in/about.php?english=English>

5 <http://collectorpalghar.in/>

6 <http://mahatribal.gov.in/htmldocs/tsparea.html>

7 [http://www.populationfirst.org/Malnutrition%20Project/M\\_105](http://www.populationfirst.org/Malnutrition%20Project/M_105)

the year 2014<sup>8</sup>. The Jawhar taluka, one of the important block in Palghar, is famous for high levels of child and infant mortality<sup>9</sup>. Latest figures indicate that over 1,000 tribal kids are found to be severely malnourished till April 2016. The main cause of malnourishment is due to the lack of awareness about the symptoms and its severity and measures to overcome the status. Providing iron and protein supplements is regarded as one of the important measures to help overcome malnutrition status in the region<sup>10,11</sup>.

On the other hand, with 55% of the district area covered by forest<sup>12</sup>, the tribes to a large extent are dependent on the local forest resources for living and livelihood. Moreover, the tribal communities gather variety of edible wild plant species from the forest which constitutes a significant portion of their diet. The medicinal plants are also been used by the locals to treat variety of ailments. However, land fragmentation, social backwardness, complete reliance on traditional farming, poor knowledge about agri business and marketing, lack of livelihood opportunities are some of the hurdles in ensuring sustainability of the tribal communities.

TERI while interacting with several stakeholders and tribal communities identified the need to put emphasis on generating local resources as a strategy rather than encouraging the villagers to continue with their reliance on external sources of food supply. Given the remote location of most of the villages, lack of resources and other logistic issues, ensuring food and nutrition security with the help of external factors is extremely challenging. Thus, TERI has been rigorously advocating a three pronged approach to develop sustainable solutions to address malnutrition in Palghar district, under its program PROTEIN (Program to Revitalize Overall health of Tribals by Ensuring Intake of Nutritious products) which include the following.

- **Active community participation**
  - Emphasis on making the communities self-sufficient for sourcing food through encouraging yearlong vegetable kitchen gardens, small scale farming, integration of modern techniques like cultivation in polyhouses, green houses under controlled conditions and so on.
- **Deploying ethnic knowledge**
  - Documentation of traditional methods, locally available food sources, wild edibles which have been consumed through generations but may have been overlooked due to knowledge gaps.
- **Training of the youth and empowering women**
  - Food fortification and processing, developing vegetable clusters, training pertaining to recycling/ processing of grey water and its further use in kitchen gardens and so on.

Interestingly, it was recorded that the tribes traditionally had their prime dependence on the local wild plants to meet their dietary and medicinal needs. Nevertheless, changing livelihood patterns and new life styles have limited them from following the traditional pattern. It was further observed that there is a rapid decline in the traditional wisdom about the wild edibles due to lack of transfer to the next generation. Reasons for the same could be

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8 <http://indiatoday.intoday.in/story/maharashtra-child-malnourished/1/443466.html>

9 [http://archive.mu.ac.in/arts/social\\_science/eco/pdfs/depart/dwp18.pdf](http://archive.mu.ac.in/arts/social_science/eco/pdfs/depart/dwp18.pdf)

10 [http://www.who.int/nutrition/publications/micronutrients/GFF\\_Part\\_1\\_en.pdf](http://www.who.int/nutrition/publications/micronutrients/GFF_Part_1_en.pdf)

11 <http://www.fao.org/docrep/w0073e/w0073e03.htm>

12 [mahaagri.gov.in/level3PdfDisp.aspx?Id=5&subid=15&sub2id](http://mahaagri.gov.in/level3PdfDisp.aspx?Id=5&subid=15&sub2id)

attributed to the lack of interest expressed by the younger generations in getting involved in such traditional practices. Lucrative urban employment opportunities could also be one of the reasons for their out migration. Review of literature further indicated that there is very limited traditional knowledge documented about the wild edibles of Jawhar block, Palghar and the knowledge present is in a very scattered form<sup>1314</sup>.

Thus Bio prospecting<sup>15</sup> was recognized as a critical first step which could help documentation of the traditional knowledge, understand the significance and further enhance the utilization and management of the resources towards malnourishment. It was also necessary to scientifically validate the information and make it available at a central platform which could be easily accessible for multiple stakeholders. It was also necessary to conserve the germplasm of these wild edibles. So the process of documenting, scientifically validating & developing a database was an important first step towards mitigating malnourishment.

## 2.3 Objectives

Keeping the following rationale in mind, the project was divided into Phase I and II and the following objectives were drafted for documentation and scientific validation of species:

### Phase I

1. **Documenting the information** about the wild edible plants of dietary and medicinal significance to the tribal communities of Jawhar.

### Phase II

2. **Scientific validation of the species-** to record the key significance of species and validate the perception of the tribes.
3. **Developing a Digital Herbarium / Catalogue** by documenting the morphotypes, propagules, habit and habitat & so on through photographic records.
4. **Establishing a Nursery** for conservation of germplasm and ensuring access to the plant species.

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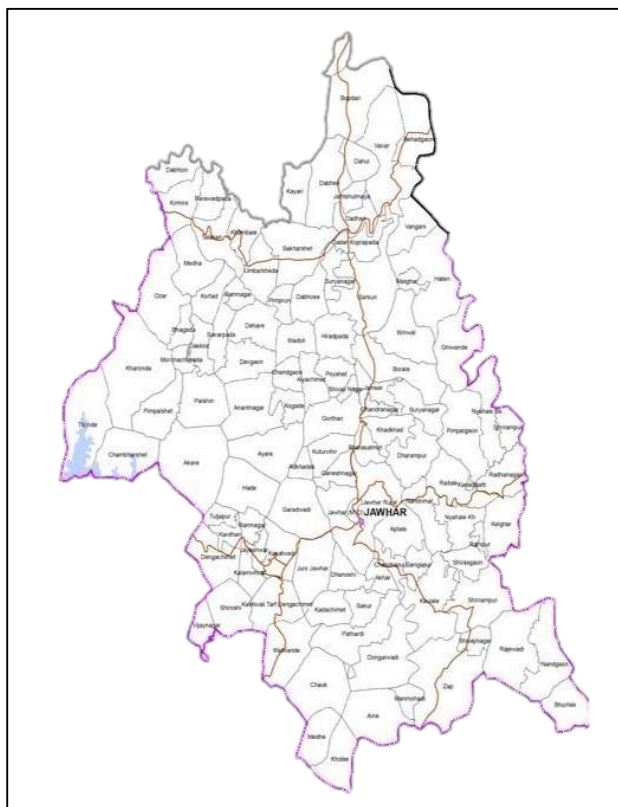
13 [http://www.ijlpr.com/admin/php/uploads/69\\_pdf.pdf](http://www.ijlpr.com/admin/php/uploads/69_pdf.pdf)

14 <http://www.cabdirect.org/abstracts/20093205237.html;jsessionid=77287B3D5AEEAAFC97B8A7555DC7CFE8>

15 Bio-prospecting is the exploration and research on indigenous knowledge related to the utilization and management of biological resources. It also touches upon the conservation and sustainable use of biological resources and the rights of local and indigenous communities.



## 2.4 Site Introduction



Map No. 1: Map of Jawhar taluka, Palghar

Jawhar block, Palghar was identified as the site for conducting the survey. Jawhar taluka lies in Konkan region and is known as Mahabaleshwar of Palghar district<sup>16</sup>. Jawhar Taluka located at 19.92°N 73.23°E is bounded by Mokhada Taluka towards east, Vikramgad Taluka towards west, Wada Taluka towards south and Trimbak Taluka towards North. It is approx. 473 meters above sea level. Being part of the Northern Western Ghats, the area is rich in biodiversity with a moist deciduous type of forest ecosystem. The region is inhabited by different tribes like Thakur, Mahadev, Koli, Varli, Katkaris and Kokana which depend different plants species for consumption and medicinal purposes. As per ethno botanical studies by Kamble et al (2009) in tribal communities of Maharashtra like Thane, some species of plants were found to be used for medicinal as well as consumption purposes<sup>17</sup>. During the study conducted by Sonawane et al. (2012), altogether fifty-seven plant<sup>18</sup> species belonging to 20 families were collected. Amongst the plants located in the study area, *Wrightia tinctoria*, *Hygrophila spinosa*, *Gloriosa superba*, *Curculigo orchiioides* and *Costus speciosus* were found to possess medicinal properties and used by local tribes. Chothe et al. (2014) have studied the use of various wild fruits by the tribes of Jawhar block<sup>19</sup>.

16 <http://palgharpolice.gov.in/history.html>

17 Kamble et al. (2009). Ethnobotany of Thakar tribe of Maharashtra, Journal of Economic and Taxonomic Botany 2009 Vol. 33 No. Supplement pp. 95-122

18 Sonawane et al. (2012). Ethnobotanical studies of Mokhada, District Thane; International journal of Life Sciences and Pharma Research, Vol 2/Issue 2, ISSN 2250-0480.

19 Chothe et al. (2014). Unconventional wild fruits and processing in tribal area of Jawhar, Thane District, Bioscience Discovery, 5(1):19-23



## 3 Methodology

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### 3.1 Documentation and validation of the wild edible plant species

#### 3.1.1 Review of Literature

Extensive review of literature (ROL) was undertaken in order to collate and validate the checklist of species and the nutritional and medical information about the wild edible species from Jawhar block. The review was also to validate the knowledge of the tribal communities with the scientific findings.

#### 3.1.2 Transect and Quadrat surveys

The transect and quadrat surveys were undertaken **with in** forest areas present near the villages as the villagers usually resort to harvest the wild plants present in and around the villages. The surveys were undertaken seasonally as the floral pattern is subjected to change as per the season. The villages were selected through random sampling process to conduct the survey. The points to be surveyed in the forest were marked using Google Earth software. On field, these points were identified, tracked and marked using a Global Positioning System (GPS). Transect surveys were undertaken between the points identified in the forest areas. Quadrats of 10m x 10m were laid at each point and the species present in the quadrat were recorded. Transect surveys were also undertaken with the help of the villagers in order to map and photodocument the plant species. Plants encountered opportunistically were also recorded to collate and update the checklist.

This approach helped document all the wild edibles present in the area irrespective to their significance to the tribal communities.

#### 3.1.3 Focused Group Discussions (FGD)

FGD's were undertaken with the tribal communities to validate the information collected in the Phase I and II as well. More than 300 villagers were interviewed during the discussions which consisted of men, women, youth and elderly people. It was important to involve all these distinct groups due to the varied significance of wild edibles. Interactions were also undertaken with the botanists (plant experts) to get the scientific overview of the collected information.

This exercise helped in validating the information about the plant species and further in strengthening the checklist.

#### 3.1.4 Nutrition analysis

Almost 800 gms of the part of the plant for which the nutritional profiling was required were collected from the field after thorough ROL. The plants for which the nutritional analysis was to be conducted were shortlisted on the 3 main parameters: 1) Lack of published data 2) Significance to the tribes 3) Feasibility of quantitative estimation. Specific test conducted on the sample after drying and powdering are mentioned in **Annexure No. IV**. Parameters such as Carbohydrates, proteins, fats and so on were identified from the tests.

Nutritional analysis facilitated us to know the nutritional components present in the plant species and helped to validate the nutritional perception of the tribal communities about the plant species.

## **3.2 Developing a Digital Library**

### **3.2.1 Review of Literature**

Information about the documented plant species was collated initially through ROL and was divided into 8 major categories such as 1) Photograph of the species 2) Description of the plant 3) Plant Usage 4) Propagation and Storage 5) Nutritive significance 6) Medicinal significance 7) Unique features 8) Classification providing information about the Nutritional and medicinal potential of the plant.

### **3.2.2 Digital documentation of species**

Photographs of various parts of the plant such as fruit, flower, leaves, stem and so on were documented seasonally using a handheld digital camera. The location of the plants was also documented using the GPS.

The photographs of the parts of the plant shall help the viewer to get a better idea about the plant and help in the identification of the plant on field.

### **3.2.3 Development of website**

An online portal was developed in the form of a digital library and the information and photographs were uploaded on the website.

## **3.3 Setting up of Nursery**

### **3.3.1 Collection of propagules**

Propagules of plant species such as seeds, bulbils, tubers and stem cuttings were collected during transect and quadrat surveys as per the availability in the field. Herbs and some shrubs were not collected due to their ephemeral nature and complexity of their growth in ex situ conditions.

### **3.3.2 Development of nursery**

Propagules such as seeds, bulbils and tubers were directly potted in the pots while the stem cuttings were initially treated with rooting powder and then potted. The pots were kept at JSW Vashind plant for further maintenance.

## 4 Results of the Project

### 4.1 Preliminary documentation of species

The focused group discussions were conducted in order to document the wild edible species and their perceptions in 20 villages as part of the Phase I. The list of villages is provided below in Table No. 1.

**Table No. 1: List of villages selected for focused group discussions**

Sr. No	Beat	Cluster	Village Surveyed
1	Chambharshet	Chambharshet	Tasupada
2		Pimpalshet	Madvihira
3		Akare	Kahandolpada
4	Kogada	Umbrachapada	Umbrachapada
5		Mothapada	Bhagada
6		Ramnagar	Savarpada
7	Ghivanda	Vinvar	Malghar
8		Hatheri	Khuripada
9		Gorthan	Chibhadepada
10	Jamsar	Kogade	Kogade
11		Jamsar	Jamsar
12		Sarsun	Sarsun
13	Sakharshet	Sakharshet	Umbervihir
14		Khambala	Khambala
15		Vavar	Behedpada
16	Dabheri	Dhodipada	Dhodipada
17		Barwadpada	Barwadpada
18		Dabheri	Pachgud
19	Sakur	Kalamvihira	Kalamvihira
20		Kasatwadi	Kasatwadi

Information about more than 190 species of wild edibles were documented which are used by the tribes for their dietary and medicinal purpose. Many of the species were photo documented and recorded for preparation of a digital catalogue. It was found that the tribes use various parts of the plant such as leaves, fruits, flowers, bark, tubers, roots and so on for consumption as well as medicinal application and purpose. Irrespective of the dependence of tribes on these wild edibles, it was found that the tribes cultivated only few species of wild edibles such as Karla, Kartoli, Dangar and so on.

Twenty seven wild edibles were collected as preserved by the tribes (Table No. 2). Out of which almost 16 (60%) & 7 (25%) were used for dietary, medicinal purpose respectively while 4 (15%) of them were used for both the purposes. A comparative analysis was also undertaken in which the perception of villagers about the use of a particular species was compared with the published scientific literature. A significant result was found in case of seeds that the tribes use seeds of only 2 specimen but the scientific studies have been done for seeds of 6 samples which indicate that the tribes are unaware about the nutritional or medicinal properties of seeds of 4 samples. Data on flowers and bark indicate that scientific properties of flowers of 2 samples and 1 sample of bark have not been studied by the researchers but the tribes are observed to be using the samples for their dietary and medicinal purposes.

This indicated the potential for further research as to identify the nutritional and medicinal properties of the samples which have not been studied. The next step was to validate this information through on field surveys, nutritional analysis, photographic documentation and development of a digital library and nursery.

**Table No. 2: List of wild edible species collected from the tribes\***

Sr. No	Local Name	Scientific name	Part of the plant
1.	Sharambal	<i>Amaranthus sps</i>	Plant sample
2.	Suran	<i>Amorphuphallus campanulatus</i>	Tuber
3.	Fanas	<i>Atocarpus heterophyllus</i>	Fruit
4.	Vaghoti	<i>Capparis zeylanica</i>	Fruits
5.	Karvanda	<i>Carissa carandas. L</i>	Fruits
6.	Tarota	<i>Cassia tora</i>	Leaves
7.	Abay	<i>Canavalia gladiate</i>	Plant sample
8.	Tanvel	<i>Cocculus hirsutus</i>	Leaves
9.	Keni	<i>Commelina benghalensis</i>	Plant sample
10.	Bhokar	<i>Cordia dichotoma</i>	Leaves
11.	Arabi	<i>Colocasia esculenta</i>	Tuber
12.	Taag	<i>Crotolaria sps</i>	Flowers
13.	Dangar	<i>Cucurbita sps</i>	Seeds
14.	Halkund	<i>Curcuma longa</i>	Root
15.	Konchai	<i>Dioscorea alata</i>	Tuber
16.	Kadu kand	<i>Dioscorea bulbifera</i>	Tuber
17.	Tendu	<i>Diospyros melanoxylon</i>	Leaves
18.	Kali Dhaman	<i>Grewia tillifolia</i>	Fruits
19.	Murudsheng	<i>Helicteres isora</i>	Fruits
20.	Ambadi	<i>Hibiscus sps</i>	Flowers
21.	Burandi	<i>Launaea intybacea</i>	Leaves
22.	Erand	<i>Ricinus communis</i>	Seeds
23.	Lothi	<i>Sauromatum venosum</i>	Tender leaves
24.	Kusum	<i>Schleichera oleosa</i>	Leaves
25.	Bibba	<i>Semecarpus anacardium</i>	Seeds
26.	Beheda	<i>Terminalia bellerica</i>	Fruits
27.	Hirda	<i>Terminalia chebula</i>	Fruit

**\*Note: As the information was collected at the initial stage without the scientific validation, the local name and scientific name may not be appropriate**

## 4.2 Checklist of the wild edible plant species

Overall, TERI conducted more than 10 transect surveys and 13 quadrat surveys across the Jawhar block. The transect routes and the quadrat points are represented below in Figure No. 1.

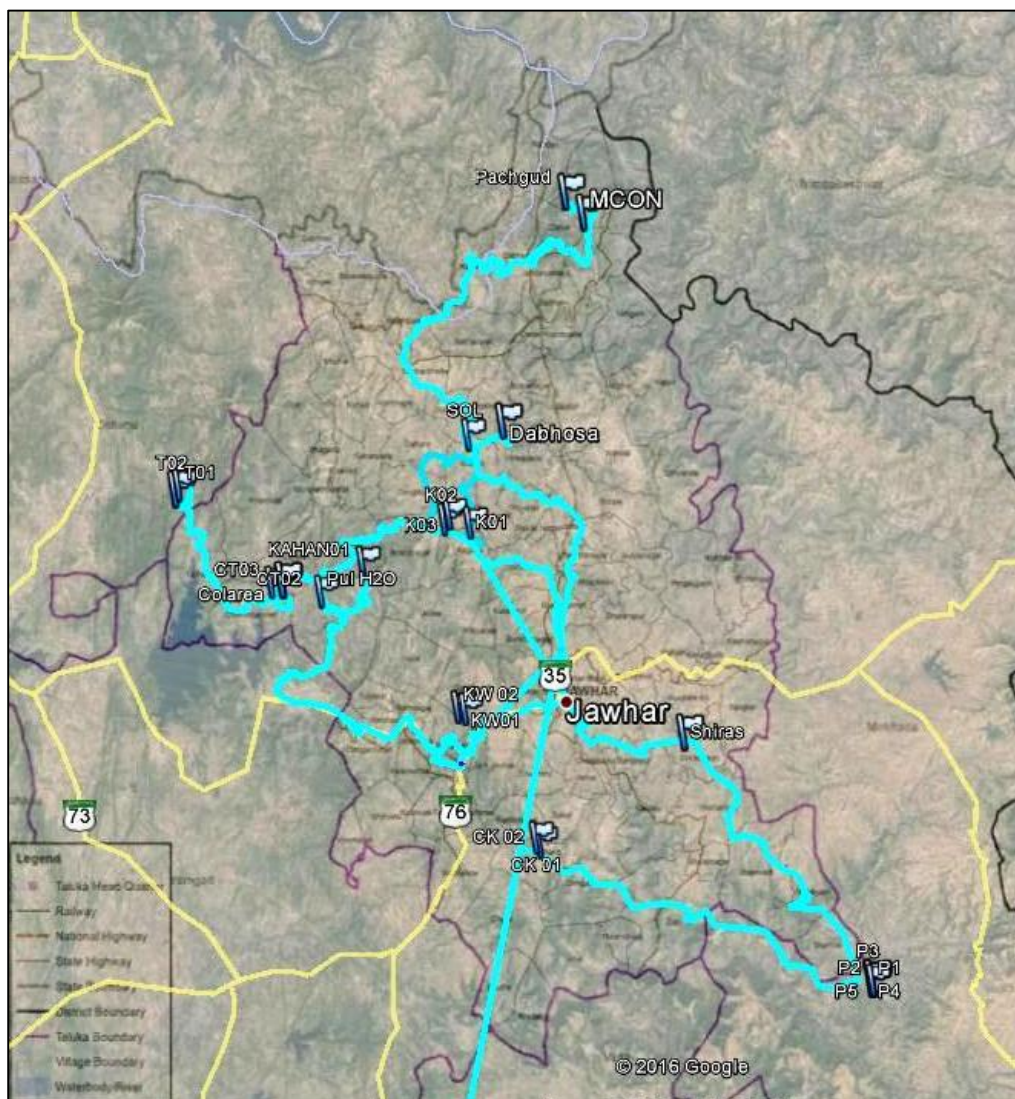


Figure No. 1: Transect and quadrat survey routes in Jawhar

Beside these on field survey techniques, several opportunistic transect surveys and observations were also conducted and recorded with the help of the villagers in order to strengthen the checklist of wild edible plants of Jawhar. These surveys largely helped to validate the data collected in the preliminary survey as well. The species recorded during transect and quadrat surveys are presented in **Annexure No. I** along with the route map.

The documentation and validation exercise altogether resulted in identifying around **163 species** of nutritional and medicinal significance to tribal communities of Jawhar.

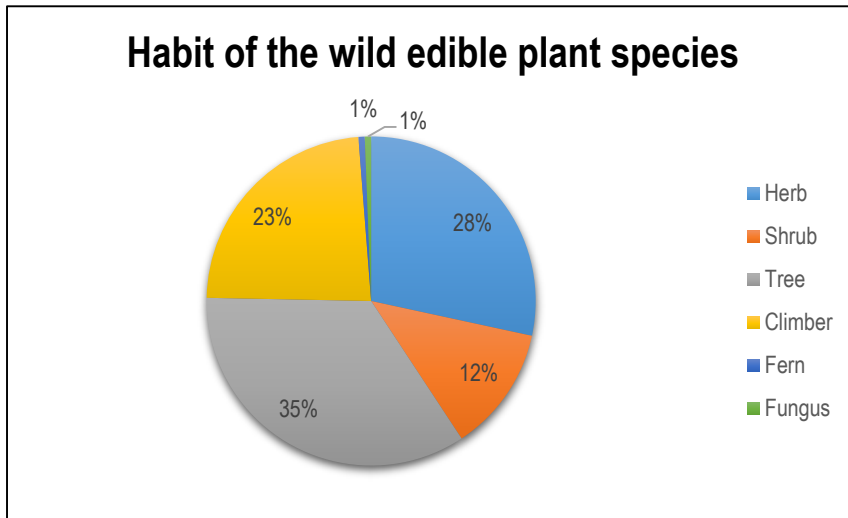


Figure No. 2: Habit of the wild edible plant species recorded in Jawhar

Out of the total species recorded (Figure No. 2), almost 35% of the species are tree; 28% are herbs followed by climbers and shrubs. Only 1% of fern and fungus species are consumed by the tribal communities. Thus, tree species and herb species are mostly significant for dietary and medicinal purposes to the tribal communities of Jawhar. The complete list of the wild edible plants along with dietary and medicinal significance is provided below in **Annexure No. V**.

The dependence of the tribal communities on the wild edibles was also identified based on transect and quadrat surveys in various areas. It was found that the tribal communities had very low dependence of the wild edibles and also eventually had very less knowledge about them in the high disturbed areas.

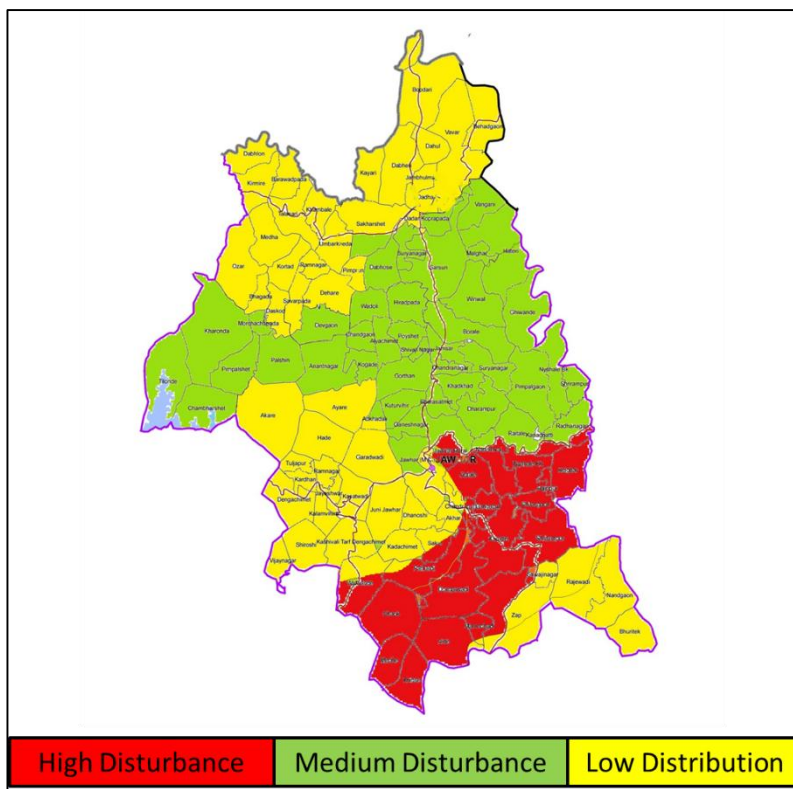


Figure No. 3: Status of forest in Jawhar region



It could be clearly observed from Figure No. 3 that most of the forest area in Jawhar faces disturbance and the key reason for the same is agriculture. Clearing of large areas of forest for agriculture have automatically reduced the diversity of edible plants which ultimately reduced the dependence and knowledge about them. Thus, it is necessary to conserve these important forest areas which support high biodiversity including wild edible species. Techniques of silviculture<sup>20</sup> needs to be introduced in the agriculture techniques which shall help conserve the wild edibles in situ.

### 4.3 Nutritional analysis of the species

In order to validate the nutritional perception of the tribes, nutritional analysis was undertaken for 7 species. These species were selected based on its significance to the tribal communities, availability about its literature and availability of the sample in nature. One unique species of plant, a fern species (*Athyrium hohenackerianum*), was found to be consumed by the tribes only in the Kasatwadi village and was thus an important for nutritional analysis (Picture No. 1). The other species for which the nutritional analysis was carried out included Greens of *Eleusine coracana*, Leaves of *Ariopsis peltata*, Leaves of *Justicia procumbens*, Young and mature leaves of *Leea macrophylla*, Young leaves and tender shoots of *Dioscorea wallichii* and Young leaves of *Schrebera swietenoides*. The nutritional analysis of the samples are presented below in Annexure No. IV.



Picture No. 1: Leaves of fern (*Athyrium hohenackerianum*) consumed by the villagers of Kasatwadi village

Few of the species showed very promising results, for e.g. Mokha or Weaver's Beam Tree (*Schrebera swietenoides*) and Teralu (*Ariopsis peltata*) has calcium content of 371mg and 450mg per 100 gm of dry matter respectively which is almost half of the RDA (Recommended Dietary Allowances) for adult women with a heavy work load (600 mg/day). Sarambhal (*Justicia procumbens*) is not only a good source of Iron as the iron content in the leaves is almost 220mg/100g and the desired need is just 21mg/100g, but is also very rich in Vitamin A (7200 IU). It has been reported that the juice of leaves of Sharambal is being used for the treatment

<sup>20</sup> A silvicultural system is the process of tending, harvesting and regenerating a forest.

of/treating ophthalmia<sup>212223</sup>. Although no medical research has been conducted so far to establish the relation between consumption of *J. procumbens* and treatment of ophthalmia, but given the fact that almost 7200 IU of vitamin A is available per 100gm of dry matter (DM) of the leaves, there is a need to conduct further research.

. Out of the six, one of the interesting species was Sapud or Dinda (*Leea macrophylla*), during the survey it was reported that tribal communities consume only the tender leaves of the plant and not the mature one, but no scientific or even outmoded explanation existed for the same. Thus, TERI through nutritional analysis tried to assess the difference between the two and it was interesting to note that the nutritional profile of young leaves is better than the adult leaves. The amount of Calcium and Iron in 100gm of DM of young leaves was 549mg and 9.3mg respectively which is about 3 times from the adult ones, Calcium (170mg) and Iron (3.4mg).

Another very interesting observation was, consumption of a fern *Athyrium hohenackerianum*, commonly called as Akkadghad at one village and amusingly, none of the other village reported the consumption of the same. Usually, ferns are not of major economic importance and majorly grown as ornamental plants, however this was an exception as it was a wild fern. On the nutritional analysis of the same, it was found to be a good source of Calcium (193mg), Magnesium (60.1mg), Iron (43.1mg) and Vitamin A (5000 IU), and it totally justifies its ingestion by the tribal community.

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<sup>21</sup> Ophthalmia is inflammation of eyes and is a symptom of Vitamin A deficiency.

<sup>22</sup> <http://www.archive.org/stream/pharmacographia03dymogoog#page/n65/mode/1up>

<sup>23</sup> <http://jn.nutrition.org/content/7/1/41.full.pdf>

## 4.4 Digital Library

This is the First of its Kind digital library developed where all the information about the wild edibles is accessible at a central place. The digital library was designed based on the photographs of the various parts of plant species and the information collected through the ROL and FGD's. The digital library shall act as a repository of traditional knowledge on wild plants of dietary and medicinal significance to the tribal communities of Jawhar taluka, Palghar, Maharashtra in digital form (Figure No. 4). The digital library was published in the public domain with a dedicated website [www.wildedibles.teriin.org](http://www.wildedibles.teriin.org) .

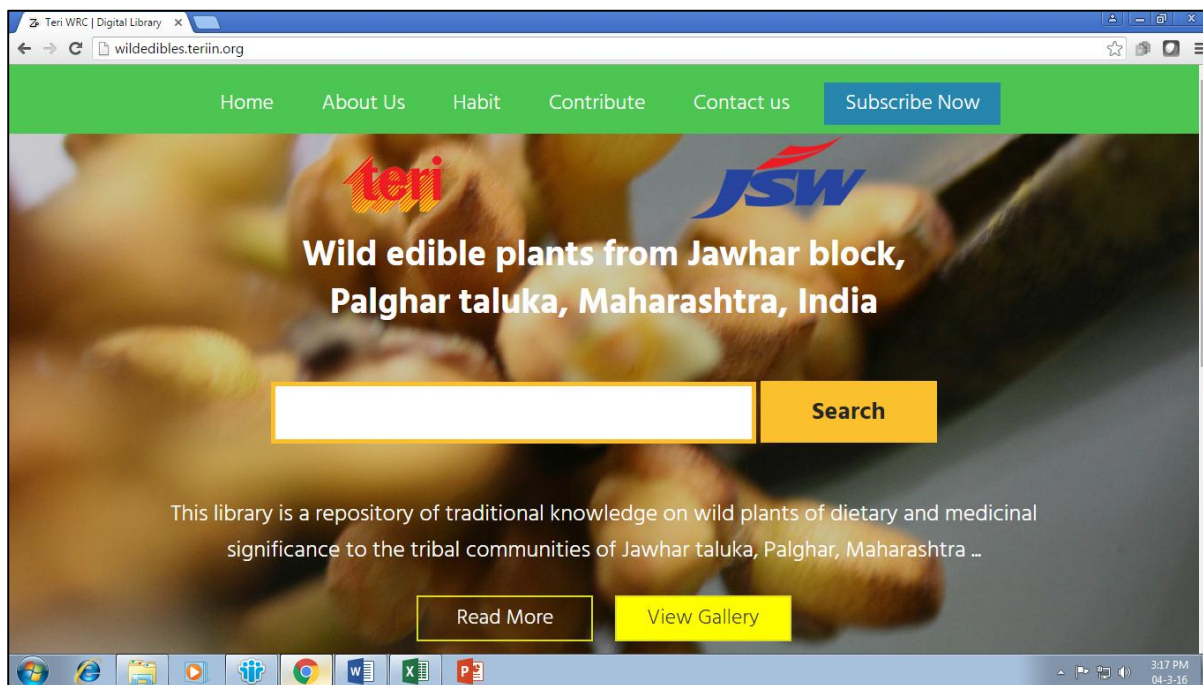


Figure No. 4: Screenshot of the digital library developed in wild edible plants of Jawhar

The information about the plant species has been distributed in 8 major heads such as (Figure No. 5):

- **Photograph of the species:** Photograph of parts of the plant.
- **Description of the plant:** General information about the plant.
- **Plant Usage:** Nutritional and medicinal use of the plants by tribal communities.
- **Propagation and storage:** Method of propagation and storage of the significant plant part.
- **Nutritive significance:** Nutritional importance of the plant.
- **Pharmaceutical significance:** Medicinal importance of the plant.
- **Unique features of the plant:** Special feature/ Use of the plant species.
- **Classification:** Scientific classification of the plant.

The exact format of the information is provided below in **Annexure No. II**.

### 4.4.1 Benefits of Digital Library

The digital library shall be of relevance to multiple stakeholders. The beneficiaries associated with the digital library are as follows:

**Government and Non-Governmental organisations** Institutions working in the Jawhar area shall understand the significance of the wild edibles to the tribal communities, which would help them address issues such as nutrition more effectively. They can use this knowledge and better integrate this concept of wild plant in their initiatives by developing nutritional products, spreading awareness among the tribal communities and so on which shall benefit the tribal communities.

**Students and Scientists** could directly use the information on wild plant species for research/study purposes related to nutrition. Through this easy information access they could better conduct their research related to plant nutrition and malnourishment which could be further used for the benefit of tribes.

**Urban dwellers** could directly access the information and gain knowledge on wild plant species. The information shall increase their confidence on the consumption of the wild plant species and increase the diversity of nutrition in their diet.

Through this initiative, we aspire to involve more stakeholders towards achieving our key aim of reducing the issue of malnourishment.

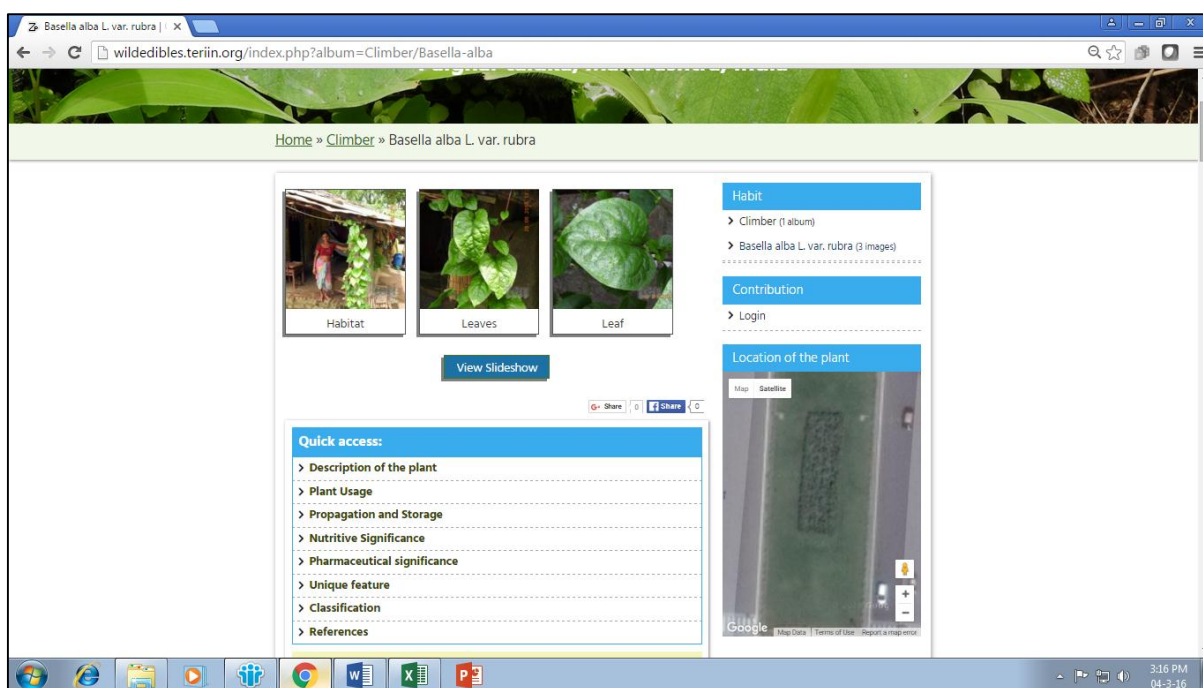


Figure No. 5: Screen shot of the information page about the plant species.

## 4.5 Nursery of wild edible plants

The propagules of wild edibles were collected in the form of seeds, tubers, bulbils, corms and stem cuttings during the field surveys conducted in various seasons. Seeds, tubers, bulbils and corms were directly planted in small pots while stem cuttings were initially applied with the rooting powder and then planted in the pots (Picture No. 2).



Picture No. 2: Collection of propagules (Left) and Potting of the propagules (Right)



Picture No. 3: Nursery of wild edible plant species developed at JSW Vashind plant

The potted plants were further transported to the JSW Vashind plant, Vashind, Thane in order to develop the wild edible plant nursery (Picture No. 3).

The list of plants present in the nursery is provided below in **Annexure No. III**. The nursery shall provide access to the propagules of these wild edible plant species for rural as well as the urban stakeholders. **The nursery shall act as a sanctuary** for the conservation of the germplasm of these wild edible plants.



## 5 Key Observations and Experiences

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### 5.1 Cultures and traditions

Majority of the tribals in Jawhar block belong to the Thakur tribe which follow a unique set of culture in their day to day activities. As part of the tradition, the women are mainly responsible to carry out the day to day chores such as collecting firewood, fetching water from the nearby well, preparing food and so on. Men usually indulge themselves in agricultural and hunting activities to provide food for the family. Agricultural activity is usually carried out in monsoons due to availability of water.

A unique culture was observed during the visit that on Tuesdays the food is to be cooked outside the house as part of the religious belief. The tribals reported that they do this on all Tuesdays in the month of March after the festive of Holi as they believe that cooking outside would help them absorb the solar energy which would build their immunity and keep them fit round the year.

Misbeliefs still form part of the culture of the tribals. In some villages such as Kalamvihira and Kasatwadi even though the villagers have conserved the traditional sacred groves they timely worship their local deity by sacrificing an animal, usually a goat or a hen. It is a belief that it would make Godhappy by the offering and would protect the village from all the natural calamities/mishaps. It was observed that the tribes are still dependent on local doctor (vaidu), who use some very traditional medicines for curing the ailments and only visit the local Primary Health Care centre (PHC) at major emergencies.

Irrespective of the fact that the area is situated close to Mumbai it was observed that the villagers still follow a traditional life away from all the social and infrastructural developments. Social empowerment activities for the tribals is of utmost necessity to help them better provide social and financial security.

## 5.2 Unsustainable Agricultural Practices

Forests form an integral part of the living of the tribes as they provide them with the basic amenities of food and shelter. Implementation of the Forest Rights Act (2006) have provided the tribes with benefits to use the local forest resources while the individual forest act have given them the permission to clear the forest area for the purpose of agriculture. Tribals largely depend on trees for fuel wood, food and as construction material. They do not completely chop off the tree but only cut few branches so that the tree does not die but branches out again in the next monsoons. Due to this, the trees lack canopy and grow in an upright manner just like the conifer trees.

In order to generate high income from agriculture and ensure food security for the family, the tribal communities have widely adopted the unsustainable agriculture practices of shift cultivation. The shift cultivation practices have resulted in large clearing of the forest areas, slopes, small streams, open land, rocky outcrops and so on to make land available for cultivation (Picture No. 4). These practices have highly resulted in soil erosion, degradation of streams, water storage capacity of the land and of the forests degradation affecting the biodiversity of the region to an extent. Tribal communities are still unaware about these situations and its consequences and thus needs to be sensitized in time.



Picture No. 4: Shift cultivation practices in Jawhar causing degradation to the natural areas



### 5.3 Economics of the wild edible plants

Tribal communities were observed to sell some of the wild edibles in the market or on road which helped them earn some additional income (Picture No. 5). They sell these wild edibles mostly during the monsoons. A dedicated space was allotted for these tribes at Gandhi Chowk, Jawhar market to sell the wild edible plants. The tribal women would harvest fresh plants from the forest and sell the same in the market and return back to their village by evening. It was further observed that there were no proper market linkages or strategies present which shall help the tribes ensure good market value for these plants. Due to this, these plants were sold at a very nominal price as mentioned below in Table No. 3.

Table No. 3: Wild edible plants and their market value

Sr. No	Name of the plant	Scientific Name	Plant part sold	Market Price
1	Baphali	<i>Heracleum grande</i>	Leaves	INR 15/ bunch
2	Kartoli	<i>Momordica dioica</i>	Fruits	INR 10/ 5 fruits
5	Math	<i>Amaranthus sps</i>	Leaves	INR 10/ bunch
6	Vasate	<i>Bambusa bambos</i>	Tender Shoots	INR 15/ 250 gm
7	Aliv	<i>Meyna laxiflora</i>	Fruits	INR 20/ 5 fruits
8	Pendhara	<i>Tamilnadia uliginosa</i>	Fruits	INR 15/ 5 fruits
9	God kanda	<i>Dioscorea esculenta</i>	Tuber and Bulbil	INR 20/ 250 gm
10	Alu	<i>Colocasia esculenta</i>	Leaves	INR 25/ 250 gm
11	Suran	<i>Amorphophallus paeoniifolius</i>	Tuber	INR 25/ 500gm
12	Ratala	<i>Ipomoea batatas</i>	Tuber	INR 30/ Kg



Picture No. 5: Tribal women selling wild edible plant in Jawhar market

## 5.4 Storage techniques for grains

Proper storage of the grains is an important activity after the grains are harvested. One of the storage practices observed during the field study was that the grains are stored in the plastic drums, with the dry leaves of Peepal tree (*Ficus religiosa*), placed on the top of the closed drum. The lid of drum is further sealed with cow dung to avoid the entry of rats or insects. Traditionally bamboo baskets were used as a storage material which are still in practice at some locations, however lately they are now being replaced with plastic drums (Picture No. 6). Another practice which was commonly observed is drying of the grains under the sun and storing it in the gunny bags in a dry place. These gunny bags have now been substituted by the plastic sacks at few places.



Picture No. 6: Primitive (Left) and modern (right) method of storage of grains

## 5.5 Biodiversity

During general discussions, the tribes provided information that earlier the area was highly rich in diversity of wild animals like birds, reptiles, insects, mammals and so on. Sometimes large cats such as the Indian Leopard (*Panthera pardus*) were spotted by the tribals in the area. However, owing to high degradation of forests, the biodiversity in the form of wildlife was seen to be very less. During the visits in Phase I, the team was able to spot reptiles such as Indian Chameleon (*Chamaeleo zeylanicus*) and Green vine snake (*Ahaetulla nasuta*) (Picture No. 2).



Picture No. 2: (L- R) *Chamaeleo zeylanicus* and *Ahaetulla nasuta* spotted at Jawhar block

Further poaching was also identified to be an important issue through discussion with the villagers. But during a visit to a village a unique snake was encountered on the road. At first site, the snake just looked just like a dry stick but on further observation it was found to be a snake and later identified as Green Vine Snake var. Brown (*Ahaetulla nasuta* var. *isabellinus*).



Picture No. 7: Green Vine snake var. Brown found on road (Inset: Close up of the snake)

## 5.6 Aquatic wild edible species

During documentation of the edible plant species, tribal communities timely indicated us that they consume aquatic species as well and the species are found in the fresh water bodies. TERI surveyed all the freshwater bodies present near the villages in Phase I, but the water bodies were mostly dry or the species were not present in that particular season. In Phase II, TERI again surveyed the major water bodies in monsoons but was again unable to locate any. Villagers were also not aware of the exact location of the plant species. Finally after intensive discussions with the elderly people, TERI was able to locate plant species in a river at Takichapada village near Dabhosa waterfall and was able to find 2 species out of 3 species of aquatic wild edibles reported during the discussions. They were further identified as Girjala (*Marsilea quadrifolia*) and Sol (*Cryptocoryne spiralis*) (Picture No. 8).while Sulsan, as referred locally, is still an unidentified species.



Picture No. 8: Girjala (*Marsilea quadrifolia*) (Left) and Sol (*Cryptocoryne spiralis*) (Right)

## 5.7 Mushrooms

A variety of mushroom species were also found during the field surveys and visits. As per discussion with the villagers, the consumption and knowledge about the wild mushroom species has largely reduced. Only few elders possess information about the same (Picture No. 9).



*Lepiota* sps.



*Hygrocybe* sps.



*Troglia infundibuliformis*



*Conocybes* sps.

Picture No. 9: Some mushrooms found during the field surveys in Jawhar

## 5.8 Energy

Government has provided electricity in majority of the villages visited in the area. Most of the villages have a grid connection with electricity supply for 7-8 hours per day. Government and few corporate organizations, as a part of their CSR (Corporate Social Responsibility), have also implemented solar lighting systems in many villages.

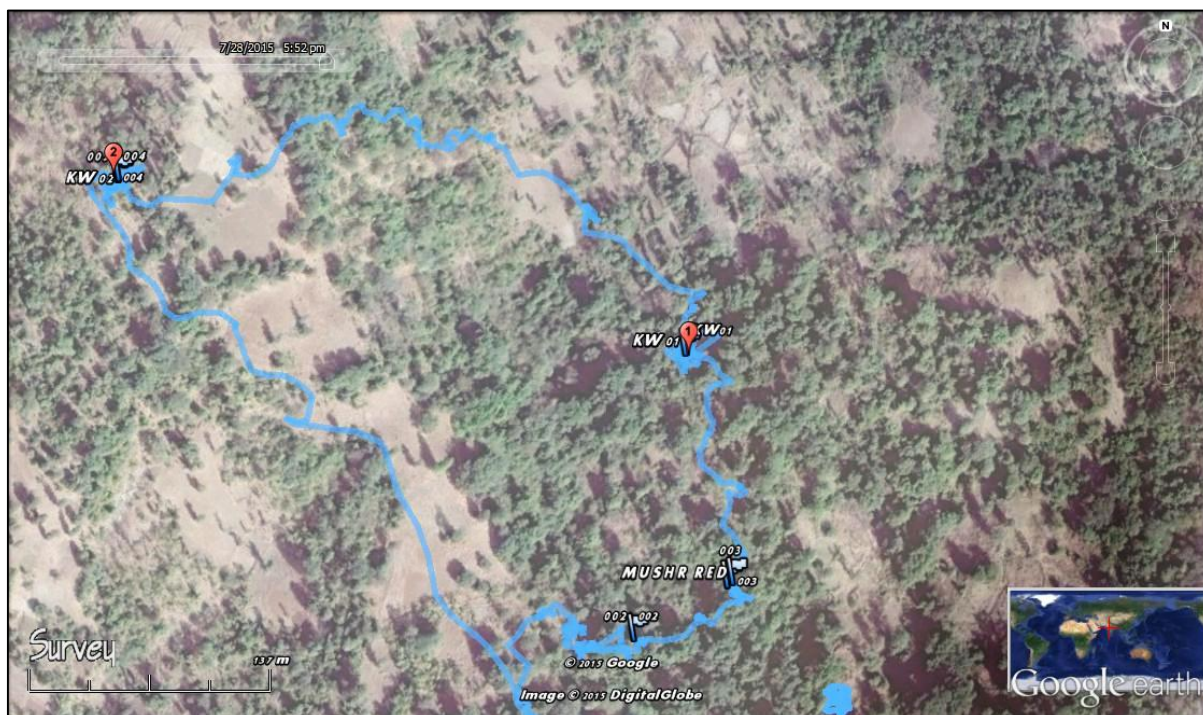
The villagers largely depend on firewood as fuel for household chores like cooking or heating water, as they cannot afford diesel or gas. This dependence on firewood has also resulted in rampant deforestation in some areas. Technologies which use renewable energy should be introduced in the area would help the villagers reduce their dependence on forest and fulfil their requirement of energy.

## 5.9 Difficulties encountered during the field surveys

- The sampling points marked on google maps for transects or quadrat surveys were not always accessible due to the topography of the area and thus new survey areas were identified after studying the location point.
- It was very difficult to photograph the plant species during heavy rains.
- Villagers were unaware of the location of the plant species and even if they knew they lacked the clarity in telling the exact location.
- The local “*vaidu*” or a village doctor was not comfortable in telling the medicinal significance of various plant species.
- Many species have different local names in different villages which led to difficulty in identifying the botanical name.

## Annexure I: Species recorded in the transect and quadrat surveys

### 1. Kasatwadi



Map No. 2: Transect and quadrat route map at Kasatwadi village

### Species recorded at Kasatwadi village

#### Transects

Table No. 4: Species recorded through transect surveys in Kasatwadi village

Sr.no.	Transect I	Transect II
1	<i>Digera muricata</i>	<i>Derris scandens</i>
2	<i>Urginia indica</i>	<i>Eleusine coracan</i>
3	<i>Terminalia bellerica</i>	<i>Leea indica</i>
4	<i>Mayena spinosa</i>	<i>Cucumis sps.</i>
5	<i>Ficus hispida</i>	<i>Cuculigo orchiodes</i>
6	<i>Maesa indica</i>	<i>Wrightia tinctoria</i>
7	<i>Dillenia pentagyna</i>	<i>Ougenia oogenesis</i>
8	<i>Breynia patens</i>	<i>Ariopsis pelata</i>

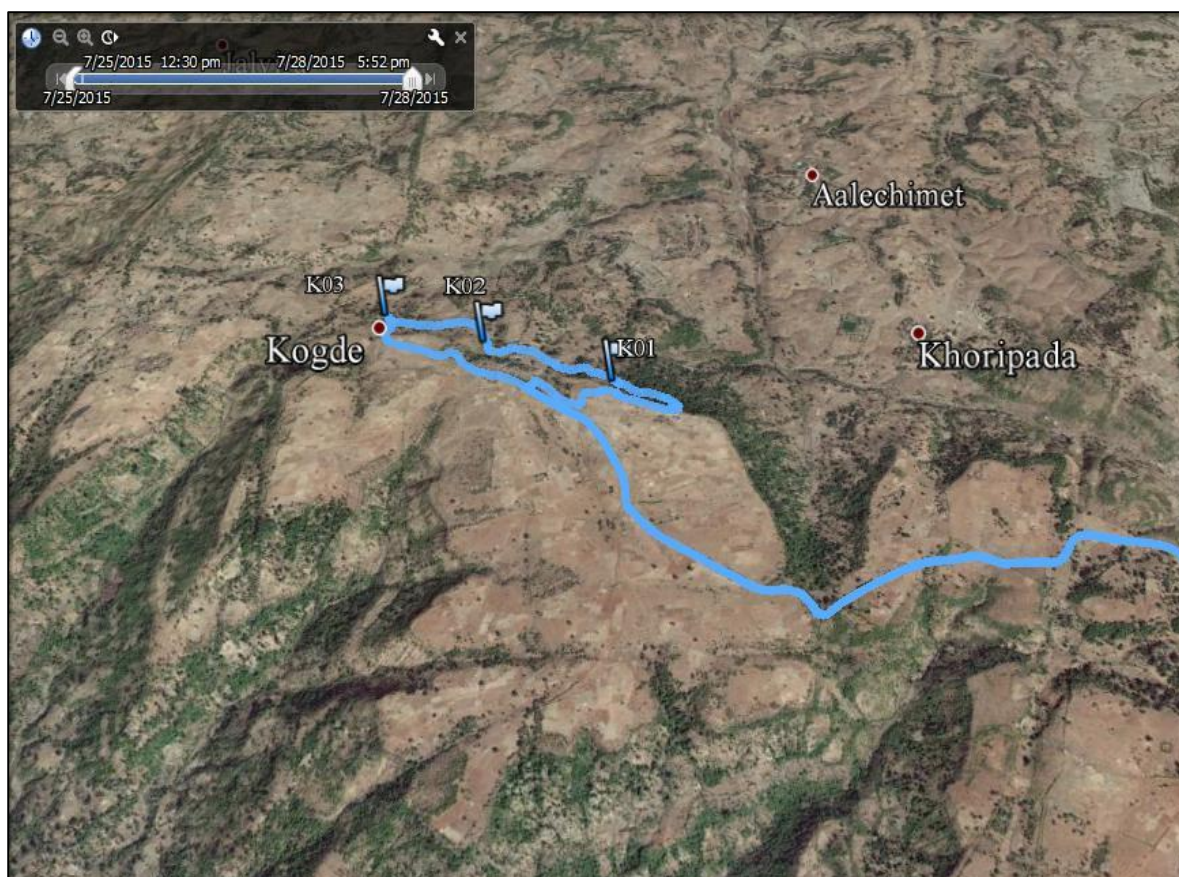
## Quadrats

Table No. 5: Species recorded through quadrat surveys in Kasatwadi village

Sr. No.	Quadrat I	Quadrat II
1	<i>Cassia fistula</i>	<i>Schleichera oleosa</i>
2	<i>Dillenia pentagyna</i>	<i>Leea indica</i>
3	<i>Leea indica</i>	<i>Anzaza lampas</i>
4	<i>Anzaza lampas</i>	<i>Carissa carandus</i>
5	<i>Dioscorea bulbifera</i>	<i>Holarrhena antidysenterica</i>
6	<i>Terminalia crenulata</i>	<i>Ariopsis peltata</i>
7	<i>Carissa carandus</i>	<i>Cuculigo orchiodes</i>
8	<i>Elephantopus scaber</i>	<i>Clematis gouriana</i>
9	<i>Casearia greveolens</i>	<i>Elephantopus scaber</i>
10	<i>Woodfordia fruticosa</i>	<i>Cassia tora</i>
11	<i>Dioscorea wallichii</i>	<i>Wrightia tinctoria</i>
12	<i>Holarrhena antidysenterica</i>	<i>Ariesema sps</i>
13		<i>Flacourtia indica</i>
14		<i>Desmodium gangeticum</i>
15		<i>Cassine glauca</i>
16		<i>Dioscorea bulbifera</i>
17		<i>Woodfordia fruticosa</i>
18		<i>Hemidesmus indicus</i>
19		<i>Terminalia crenulata</i>
20		<i>Casearia greveolens</i>
21		<i>Radermachera xylocarpa</i>
22		<i>Ougenia oogenesis</i>
23		<i>Anogeissus pendula</i>
24		<i>Erenthemum roseum</i>



## 2. Kogada



Map No. 3: Transect and quadrat route map at Kogada village

### Species recorded at Kogada village

#### Transects

Table No. 6: Species recorded through transect surveys in Kogada village

Sr. No	Transect I	Transect II	Transect III
1.	<i>Pavetta crassicaulis</i>	<i>Dioscorea bulbifera</i>	<i>Vigna mungo</i>
2.	<i>Ariopsis peltata</i>	<i>Cissemelos pareira</i>	<i>Terminalia chebula</i>
3.	<i>Cassia tora</i>	<i>Terminalia crenulata</i>	<i>Cassia tora</i>
4.	<i>Wrightia tinctoria</i>	<i>Cassia tora</i>	<i>Ficus racemosa</i>
5.	<i>Dioscorea bulbifera</i>	<i>Solena amplexicaulis</i>	<i>Leea indica</i>
6.	<i>Carissa carandus</i>	<i>Vigna radiata</i> var. sublobata	<i>Ariseima sps.</i>
7.	<i>Cheilanthes sps.</i>	<i>Madhuca indica</i>	<i>Carrisa carandus</i>
8.	<i>Cissemelos parera</i>	<i>syzizium cumini</i>	<i>Amorphophallus sps.</i>
9.	<i>Woodfordia fruticosa</i>	<i>Emlica officinalis</i>	<i>syzizium cumini</i>
10.	<i>Begonia crenata</i>	<i>Amorphophallus sps.</i>	<i>Sesame oreitale</i>
11.	<i>Leea indica</i>	<i>Terminalia chebula</i>	<i>Terminalia crenulata</i>
12.	<i>Bauhinia foveolata</i>	<i>Carrisa carandus</i>	<i>Eleusine coracana</i>
13.	<i>Dillenia pentagyna</i>	<i>Dillenia pentagyna</i>	<i>Colocasia esculenta</i>

Sr. No	Transect I	Transect II	Transect III
14.	<i>Mayena spinosa</i>	<i>Woodfordia fruticosa</i>	
15.	<i>Ariesema</i> sps.	<i>Anacardium occidentale</i>	
16.	<i>Madhuca indica</i>	<i>Terminalia bellerica</i>	
17.	<i>Curculigo orcheoides</i>	<i>Digera muricata</i>	
18.	<i>Cassia fistula</i>	<i>Cassine glauca</i>	
19.	<i>Terminalia crenulata</i>	<i>Sesame oreitale</i>	
20.	<i>Holerrhena antidysenterica</i>	<i>Diospyros melanoxylon</i>	
21.	<i>Clematis gouriana</i>		

## Quadrats

Table No. 7: Species recorded through quadrat surveys in Kogada village

Sr. No	Quadrat I	Quadrat II	Quadrat III
1.	<i>Madhuca indica</i>	<i>Terminalia chebula</i>	<i>Bridelia retusa</i>
2.	<i>Ariesema</i> sps.	<i>Cassia tora</i>	<i>Leea indica</i>
3.	<i>Dioscorea bulbifera</i>	<i>Ficus racemosa</i>	<i>Azanza lampas</i>
4.	<i>Carissa carandus</i>	<i>syzizium cuminii</i>	<i>Cassia tora</i>
5.	<i>Vigna radiata</i> <i>var.sublobata</i>	<i>Oryza sativa</i>	<i>Cheilanthes</i> sps.
6.	<i>Cassia tora</i>	<i>Colocasia esculenta</i>	<i>Terminalia crenulata</i>
7.	<i>Ariopsis peltata</i>	<i>Leea indica</i>	<i>Lannea coromendalica</i>
8.	<i>Ficus racemosa</i>	<i>Dioscorea bulbifera</i>	<i>syzizium cuminii</i>
9.	<i>Cheilanthes</i> sps.	<i>Ariesema</i> sps.	<i>Woodfordia fruticosa</i>
10.	<i>Emlica officinalis</i>	<i>Amorphophallus</i> sps.	<i>Carrisa carandus</i>
11.		<i>Terminalia crenulata</i>	<i>Amorphophallus</i> sps.
12.			<i>Stereospermum chelonoides</i>
13.			<i>Dolichondrom falcata</i>
14.			<i>Butea monosperma</i>

### 3. Chauk



Map No. 4: Transect and quadrat route map at Chauk village

### Species recorded at Chauk village

#### Quadrat

Table No. 8: Species recorded through quadrat surveys in Chauk village

Sr. No	Quadrat I	Quadrat II
1.	<i>Cassia fistula</i>	<i>Carrisa spinarum</i>
2.	<i>Terminalia bellerica</i>	<i>Athurium sp</i>
3.	<i>Chorchorus olitorios</i>	<i>Embelia tsjerum-cottum</i>
4.	<i>Thespesia lampas</i>	<i>Hemidesmus indicus</i>
5.	<i>Amorphophallus commutatus</i>	<i>Bridelia retusa</i>
6.	<i>Garuga pinnata</i>	<i>Elephantopus scaber</i>
7.	<i>Wrightia tinctoria</i>	<i>Thespesia lampas</i>
8.	<i>Dioscorea bulbifera</i>	<i>Curculigo orchiodes</i>
9.	<i>Dioscorea pentaphylla</i>	<i>Aropsis peltata</i>
10.	<i>Curcuma pseudomontana</i>	<i>Casearia graveolens</i>
11.	<i>Cassia tora</i>	<i>Clematis gouriana</i>
12.		<i>Terminalia tomentosa</i>
13.		<i>Tectona grandis</i>
14.		<i>Justicia procumbens</i>
15.		<i>Curcuma psedomontana</i>
16.		<i>Flacaurtia indica</i>
17.		<i>Impations balsamina</i>

## 4. Kurlod



Map No. 5: Transect and quadrat route map at Kurlod village

### Species recorded at Kurlod village

#### Transect

Table No. 9: Species recorded through transect survey in Kurlod village

Sr. No	Transect I
1.	<i>Pogostemon benghalensis</i>
2.	<i>Leea asiatica</i>
3.	<i>Dioscorea bulbifera</i>
4.	<i>Wrightia tinctoria</i>
5.	<i>Bombax ceiba</i>
6.	<i>Ariopsis peltata</i>
7.	<i>Casearia graveolens</i>
8.	<i>Madhuca longifolia</i> <i>var. latifolia</i>
9.	<i>Amorphophallus commutatus</i>
10.	<i>Terminalia tomentosa</i>
11.	<i>Tectona grandis</i>
12.	<i>Leea macrophylla</i>
13.	<i>Moringa oleifera</i>
14.	<i>Cissampelos pereira</i>
15.	<i>Cassia tora</i>
16.	<i>Ficus racemosa</i>

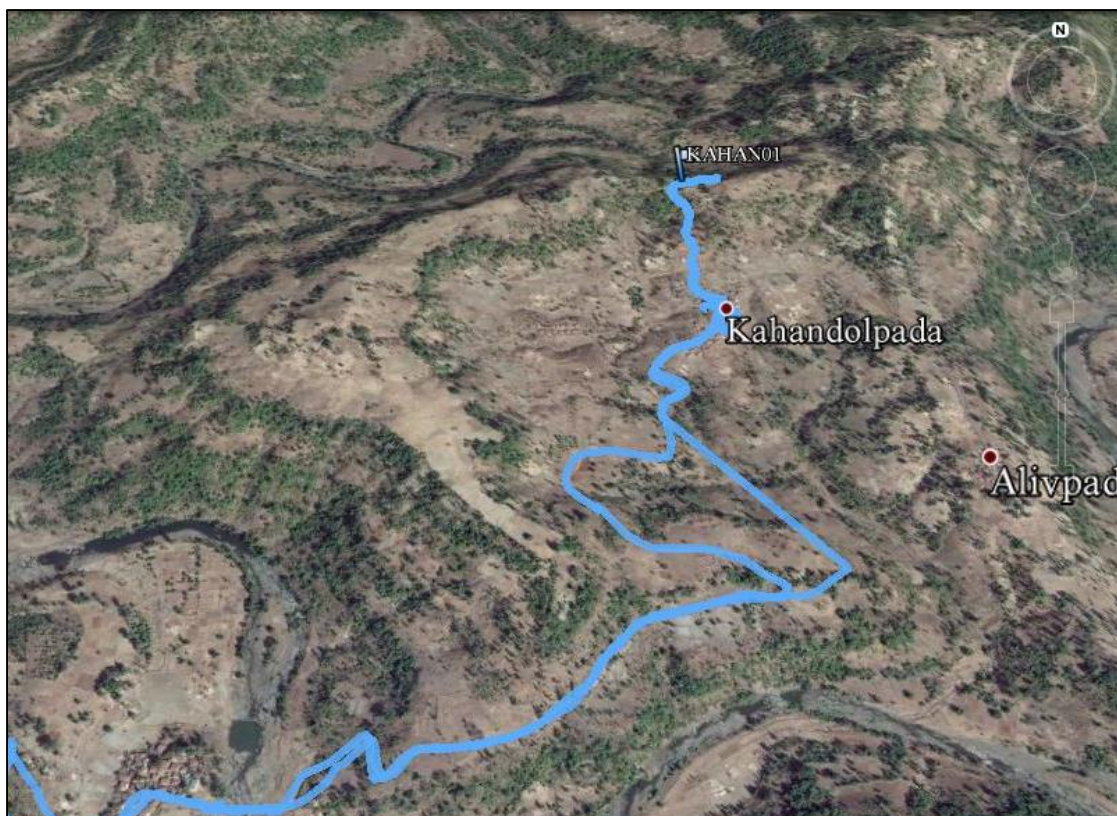
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 Quadrats

Table No. 10: Species recorded through quadrat survey in Kurlod village

Sr. No	Quadrat I	Quadrat II
1.	<i>Pogostemon benghalensis</i>	<i>Echnicloa colona</i>
2.	<i>Thespesia lampas</i>	<i>Trichodesma indicum</i>
3.	<i>Dioscorea bulbifera</i>	<i>Pogostemon benghalensis</i>
4.	<i>Wrightia tinctoria</i>	<i>Holarrhena pubescens</i>
5.	<i>Carrisa spinarum</i>	<i>Dioscorea pentaphylla</i>
6.	<i>Casearia graveolens</i>	<i>Tectona grandis</i>
7.	<i>Holarrhena pubescens</i>	<i>Cassia tora</i>
8.	<i>Vitex nigundo</i>	
9.	<i>Terminalia tomentosa</i>	
10.	<i>Tectona grandis</i>	
11.	<i>Leea macrophylla</i>	
12.	<i>Cassia tora</i>	

## 5. Kahandolpada



Map No. 6: Transect and quadrat route map at Kahandolpada village

### Species recorded at Kahandolpada village

#### Transects

Table No. 11: Species recorded through transect survey in Kahandolpada village

Sr. No	Transect I
1.	<i>Athurium sp</i>
2.	<i>Achyranthes aspera</i>
3.	<i>Mayna laxiflora</i>
4.	<i>Bridelia retusa</i>
5.	<i>Helicteres isora</i>
6.	<i>Dendrocalamus strictus</i>
7.	<i>Heracleum grande</i>
8.	<i>Lagerstomea parviflora</i>
9.	<i>Dioscorea alata</i>
10.	<i>Mukia maderaspatana</i>
11.	<i>Anogeissus latifolia</i>
12.	<i>Dioscorea wallichii</i>
13.	<i>Leea macrophylla</i>
14.	<i>Ipomoea muricata</i>

Sr. No	Transect I
15.	<i>Leea asiatica</i>
16.	<i>Dioscorea bulbifera</i>
17.	<i>Garuga pinnata</i>
18.	<i>Dioscorea esculenta</i>
19.	<i>Ariopsis peltata</i>
20.	<i>Phoenix sylvestris</i>
21.	<i>Casearia graveolens</i>
22.	<i>Schleichera oleosa</i>
23.	<i>Holarrhena pubescens</i>
24.	<i>Celosia argentea</i>
25.	<i>Amorphophallus comutatus</i>
26.	<i>Dioscorea pentaphylla</i>
27.	<i>Amaranthus viridis</i>
28.	<i>Cucumis setosus</i>
29.	<i>Cheilocostus speciosus</i>
30.	<i>Pogostemon benghalensis</i>
31.	<i>Thespesia lampas</i>
32.	<i>Thespesia populena</i>
33.	<i>Moringa oleifera</i>
34.	<i>Bauhinia racemosa</i>
35.	<i>Flacaurtia indica</i>
36.	<i>Cissampelos pereira</i>
37.	<i>Cassia tora</i>
38.	<i>Colocasia esculenta</i>
39.	<i>Oroxylum indicum</i>
40.	<i>Vigna radiata</i>
41.	<i>Capparis zeylanica</i>
42.	<i>Heterophragma quadrioculare</i>
43.	<i>Trichodesma indicum</i>
44.	<i>Hemidesmus indicus</i>

## 6. Shirasgaon

### Species recorded at Shirasgaon village

#### Transect

Table No. 12: Species recorded through transect survey in Shirasgaon village

Sr. No	Transect I
1.	<i>Hibiscus cannabius</i>
2.	<i>Thespesia populenea</i>
3.	<i>Dioscorea alata</i>
4.	<i>Cucurbita maxima</i>
5.	<i>Lagenaria siceraria</i>
6.	<i>Ipomoea muricata</i>
7.	<i>Momordica charantia L.</i>
8.	<i>Diocorea esculanta</i>
9.	<i>Amaranthus spinosus</i>
10.	<i>Guizotia abyssinica</i>
11.	<i>Casearia graveolens</i>
12.	<i>Celosia argentea</i>
13.	<i>Amaranthus viridis</i>
14.	<i>Justicia procumbens</i>
15.	<i>Moringa oleifera</i>
16.	<i>Luffa acutangula</i>
17.	<i>Cleome viscosa</i>
18.	<i>Cassia tora</i>
19.	<i>Colocasia esculenta</i>



## 7. Chambharshet



Map No. 7: Transect and quadrat route map at Chambharshet village

### Species recorded at Chambharshet village

#### Transect

Table No. 13: Species recorded through transect survey in Chambharshet village

Sr. No	Transect I
1.	<i>Bridelia retusa</i>
2.	<i>Terminalia tomentosa</i>
3.	<i>Cassia fistula</i>
4.	<i>Terminalia bellerica</i>
5.	<i>Lagerstroemia parviflora</i>
6.	<i>Corchorus olitorius</i>
7.	<i>Dioscorea wallichii</i>
8.	<i>Grewia tilifolia</i>
9.	<i>Stetrulia gutata</i>
10.	<i>Dregea volubilis</i>
11.	<i>Abrus precatorius</i>
12.	<i>Dioscorea bulbifera</i>
13.	<i>Garuga pinnata</i>
14.	<i>Dillenia pentagyna</i>
15.	<i>Carrisa spinarum</i>

Sr. No	Transect I
16.	<i>Amaranthus spinosus</i>
17.	<i>Smithia conferta</i>
18.	<i>Ariopsis peltata</i>
19.	<i>Casearia graveolens</i>
20.	<i>Dioscorea alata</i>
21.	<i>Holarrhena pubescens</i>
22.	<i>Amorphophallus commutatus</i>
23.	<i>Basella alba</i>
24.	<i>Madhuca longifolia</i> <i>var. latifolia</i>
25.	<i>Butea monosperma</i>
26.	<i>Pogostemon benghalensis</i>
27.	<i>Tectona grandis</i>
28.	<i>Justicia procumbens</i>
29.	<i>Bauhinia racemosa</i>
30.	<i>Luffa acutangula</i>
31.	<i>Cissampelos pereira</i>
32.	<i>Cassia tora</i>
33.	<i>Colocasia esculenta</i>
34.	<i>Impatines balsamina</i>
35.	<i>Heterophragma quadriloculare</i>

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 Quadrats

Table No. 14: Species recorded through quadrat surveys in Chambharshet village

Sr. No	Quadrat I	Quadrat II
1.	<i>Phyllanthus emblica</i>	<i>Terminalia tomentosa</i>
2.	<i>Terminalia tomentosa</i>	<i>Meyna laxiflora</i>
3.	<i>Meyna laxiflora</i>	<i>Lagerstomea parviflora</i>
4.	<i>Cassia fistula</i>	<i>Ziziphus mauritiana</i>
5.	<i>Lagerstroemia parviflora</i>	<i>Leea macrophylla</i>
6.	<i>Leea macrophylla</i>	<i>Solena amplexicaulis</i>
7.	<i>Thespesia lampas</i>	<i>Dioscorea bulbifera</i>
8.	<i>Leea asiatica</i>	<i>Bombax ceiba</i>
9.	<i>Solena amplexicaulis</i>	<i>Radermachera xylocarpa</i>
10.	<i>Dioscorea bulbifera</i>	<i>Casearia graveolens</i>
11.	<i>Garuga pinnata</i>	<i>Amorphophallus commutatus</i>
12.	<i>Carrisa spinarum</i>	<i>Dioscorea pentaphylla</i>
13.	<i>Trichosanthes tricuspidata</i>	<i>Butea monosperma</i>
14.	<i>Casearia graveolens</i>	<i>Cheilocostus speciosus</i>
15.	<i>Amorphophallus commutatus</i>	<i>Curcuma pseudomontana</i>
16.	<i>Dioscorea pentaphylla</i>	<i>Cassia tora</i>
17.	<i>Tectona grandis</i>	<i>Oroxylum indicum</i>
18.	<i>Justicia procumbens</i>	<i>Impatines balsamina</i>
19.	<i>Cissampelos pereira</i>	
20.	<i>Cassia tora</i>	
21.	<i>Diospyros melanoxylon</i>	
22.	<i>Colocasia esculenta</i>	
23.	<i>Dioscorea wallichii</i>	



## 8. Tilonde

Map No. 8: Transect and quadrat route map at Tilonde village

### Species recorded at Tilonde village

#### Quadrats

Table No. 15: Species recorded through quadrat survey in Tilonde village

Sr. No	Quadrat I	Quadrat II
1.	<i>Thespesia populnea</i>	<i>Cassia fistula</i>
2.	<i>Lagerstroemia parviflora</i>	<i>Terminalia bellerica</i>
3.	<i>Leea macrophylla</i>	<i>Pterocarpus marsupium</i>
4.	<i>Dioscorea bulbifera</i>	<i>Lagerstroemia parviflora</i>
5.	<i>Garuga pinnata</i>	<i>Grewia tilifolia</i>
6.	<i>Carrisa spinarum</i>	<i>Leea macrophylla</i>
7.	<i>Bombax ceiba</i>	<i>Stetrculia gutata</i>
8.	<i>Holarrhena pubescens</i>	<i>Dregea volubilis</i>
9.	<i>Tectona grandis</i>	<i>Miliusa tomentosa</i>
10.	<i>Cissampelos pereira</i>	<i>Dioscorea bulbifera</i>
11.	<i>Impatines balsamina</i>	<i>Garuga pinnata</i>
12.		<i>Carrisa spinarum</i>

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Sr. No	Quadrat I	Quadrat II
13.		<i>Casearia graveolens</i>
14.		<i>Holarrhena pubescens</i>
15.		<i>Amorphophallus commutatus</i>
16.		<i>Madhuca longifolia var.latifolia</i>
17.		<i>Schrebera swietenoides</i>
18.		<i>Butea monosperma</i>
19.		<i>Tectona grandis</i>
20.		<i>Justicia procumbens</i>
21.		<i>Cissampelos pereira</i>
22.		<i>Cassia tora</i>
23.		<i>Impatines balsamina</i>
24.		<i>Heterophragma quadriloculare</i>

## 9. Pachgud



Map No. 9: Transect and quadrat route map at Pachgud village

### Species recorded at Pachgud village

#### Transect

Table No. 16: Species recorded through transect survey in Pachgud village

Sr. No	Transect I
1.	<i>Bridelia retusa</i>
2.	<i>Terminalia tomentosa</i>
3.	<i>Athyrium sp</i>
4.	<i>Hibiscus cannabinus</i>
5.	<i>Cassia fistula</i>
6.	<i>Terminalia bellerica</i>
7.	<i>Oryza sativa</i>
8.	<i>Abelmoschus esculentus</i>
9.	<i>Lagerstroemia parviflora</i>
10.	<i>Elephantopus scaber</i>
11.	<i>Ageratum conyzoides</i>
12.	<i>Tamarindus indica</i>
13.	<i>Physalis minima</i>
14.	<i>Corchorus olitorius</i>

Sr. No	Transect I
15.	<i>Dioscorea wallichii</i>
16.	<i>Grewia tilifolia</i>
17.	<i>Lagenaria siceraria</i>
18.	<i>Dregea volubilis</i>
19.	<i>Artocarpus heterophyllus</i>
20.	<i>Abrus precatorius</i>
21.	<i>Sorghum bicolor</i>
22.	<i>Dioscorea bulbifera</i>
23.	<i>Garuga pinnata</i>
24.	<i>Carrisa spinarum</i>
25.	<i>Momordica dioica</i>
26.	<i>Amaranthus spinosus</i>
27.	<i>Smithia conferta</i>
28.	<i>Ariopsis peltata</i>
29.	<i>Grewia abutilifolia</i>
30.	<i>Casearia graveolens</i>
31.	<i>Dioscorea alata</i>
32.	<i>Holarrhena pubescens</i>
33.	<i>Celosia argentea L.</i>
34.	<i>Amorphophallus commutatus</i>
35.	<i>Dioscorea pentaphylla</i>
36.	<i>Zea mays</i>
37.	<i>Capsicum annum</i>
38.	<i>Madhuca longifolia</i> <i>var. latifolia</i>
39.	<i>Dioscorea esculanta</i>
40.	<i>Schrebera swietenoides</i>
41.	<i>Eleusine coracana</i>
42.	<i>Butea monosperma</i>
43.	<i>Cheilocostus speciosus</i>
44.	<i>Tectona grandis</i>
45.	<i>Justicia procumbens</i>
46.	<i>Cordia dichotoma</i>
47.	<i>Bauhinia racemosa</i>
48.	<i>Luffa acutangula</i>
49.	<i>Flacourtia indica</i>
50.	<i>Cissampelos pereira</i>
51.	<i>Cassia tora</i>
52.	<i>Colocasia esculenta</i>
53.	<i>Impatines balsamina</i>

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Sr. No	Transect I
54.	<i>Ziziphus rugosa</i>
55.	<i>Cajanus cajan</i>
56.	<i>Vigna radiata.</i>
57.	<i>Dioscorea pentaphylla</i>
58.	<i>Ficus racemosa</i>
59.	<i>Dioscorea hispida</i>
60.	<i>Lablab purpureus</i>
61.	<i>Heterophragma quadrioculare</i>



## 10. Dabhosa



Map No. 10: Transect and quadrat route map at Dabhosa village

### Species recorded at Dabhosa village

#### Transect

Table No. 17: Species recorded through transect survey in Dabhosa village

Sr. No	Transect I
1.	<i>Dioscorea bulbifera</i>
2.	<i>Terminalia tomentosa</i>
3.	<i>Carrisa spinosa</i>
4.	<i>Thespesia lampas</i>
5.	<i>Leea asiatica</i>
6.	<i>Ariopsis peltata</i>
7.	<i>Moringa cocanensis</i>
8.	<i>Radermachera xylocarpa</i>
9.	<i>Ficus racemosa</i>

## Annexure II: Format for Information on species in Digital Library

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*Botanical name of the species along with authors name (Eg. Mangifera indica L. / Roxb)*

### **(I) Photographs**

Photographs of the plant parts like leaves, fruits and habit

### **(II) Description of the plant**

#### ○ **Introduction:**

1. **Botanical name:**
2. **Vernacular name:**
  - Marathi:
  - Hindi:
  - English:

#### ○ **Availability and Occurrence**

- 1) Availability of the plant species in India
- 2) Global distribution
- 3) Location of collection- The exact location of the village (GPS coordinates) in Jawhar block where the photos were taken or the plant was collected.

#### ○ **Habit**

Whether the plant is an herb, shrub, tree or climber.

#### ○ **Habitat**

The required habitat (biotic and abiotic factors) for the plant

#### ○ **Identification guide (Plant part)**

The structure, size, shape, color etc. of that particular part of the plant.

Leaves

Flowers

Fruits

Stem

Also add **special identification character**, if any

### **(III) Plant Usage**

#### ○ **Edible Parts**

Specify the part of the plant consumed by the tribal communities

##### 1. **Traditional Recipe**

- The traditional recipe used by the tribal communities for making the desired dish out of the plant part.

##### 2. **Other recipes**

- Recipe other than one used by tribal communities, through review of literature.

##### 3. **Traditional medicinal Use**

- The traditional use of the tribal for medicinal purpose.

##### 4. **Global Use**

- Use of the species at global scale

#### ○ **Non edible parts**

The non-edible part of the plant along with its use, if any

**Toxicity:** If any plant part is toxic or non-toxic and information about the same.

**Other Information:** If any

### **(IV) Propagation and Storage**

#### ○ **Season of collection**

The season when the required plant part could be collected.

#### ○ **How to grow it?**

The possible ways in which the plants could be grown by a third person.

(E.g. By sowing of seeds or plant cutting or any other propagule)

#### ○ **Method of storage**

- 1) Storage of the Propagules
- 2) Storage of the Edible parts

### **(V) Nutritive Significance:**

#### ○ **Literature review:**

Key significant points on the nutritional aspects of the plants through review of literature.

Nutritional facts, if present.

### **(VI) Pharmaceutical significance**

Key significant points on the medicinal aspects of the plants through review of literature.

### **(VII) Unique factor**

● **Some special property**

Some special property, characteristic or use of the plant other than the information mentioned above

### **(VIII) Classification**

Classification of the plant species as per the standard hierarchy such as

1. Kingdom :
2. Phylum :
3. Class :
4. Order :
5. Family :
6. Genus :
7. Species :

## Annexure III: List of plants at the nursery

Sr. No.	Local name	Botanical name	Family	Propagule Type
1	Tetu/Tetava	<i>Oroxylum indicum</i>	Bignoniaceae	Cutting and Seeds
2	Koshim/Kusum	<i>Schleichera oleosa</i>	Sapindaceae	Sapling
3	Takala	<i>Senna tora</i>	Leguminosae	Seeds
4	Kharsheng	<i>Radermachera xylocarpa</i>	Bignoniaceae	Cutting
5	Dhayati	<i>Woodfordia fruticosa</i>	Lythraceae	Cutting
6	Nirgudi	<i>Vitex negundo</i>	Lamiaceae	Cutting
7	Audumbar	<i>Ficus racemosa</i>	Moraceae	Cutting
8	Bel	<i>Aegle marmelos</i>	Rutaceae	Cutting
9	Abai	<i>Canavalia gladiata</i>	Leguminosae	Seeds
10	Vaghati	<i>Capparis zeylanica</i>	Capparaceae	Sapling and seeds
11	Murudsheng/Atai	<i>Helicteres isora</i>	Malvaceae	Sapling and seeds
12	Shegut	<i>Moringa oleifera</i>	Moringaceae	Cutting
13	Toran	<i>Ziziphus rugosa</i>	Rhamnaceae	Sapling
14	Katesawar	<i>Bombax ceiba</i>	Malaceae	Cutting and Sapling
15	Tambat/Ghugurval	<i>Flacourtia indica</i>	Salicaceae	Cutting
16	Phangali/Pangali	<i>Pogostemon benghalensis</i>	Lamiaceae	Cutting
17	Phapat/nadugali	<i>Pavetta crassicaulis</i>	Rubiaceae	Cutting
18	Bondara	<i>Lagerstroemia parviflora</i>	Lythraceae	Cutting and Seeds
19	Bahava	<i>Cassia fistula</i>	Leguminosae	Cutting
20	Aasand/Asana	<i>Bridelia retusa</i>	Phyllanthaceae	Sapling
21	Palas	<i>Butea monosperma</i>	Leguminosae	Sapling
22	Kirmora	<i>Casearia graveolens</i>	Salicaceae	Cutting
23	Aliv/alu	<i>Meyna laxiflora</i>	Rubiaceae	Sapling and cutting
24	Humb	<i>Miliusa tomentosa</i>	Annonaceae	Sapling and cutting
25	Kaju	<i>Anacardium occidentale</i>	Anacardiaceae	Sapling
26	Kusar	<i>Jasminum malabaricum</i>	Oleaceae	Sapling
27	Lokhandi	<i>Ixora brachiata</i>	Rubiaceae	Cutting
28	Moh	<i>Madhuca longifolia var. latifolia</i>	Sapotaceae	Sapling
29	Mayalu	<i>Basella alba</i>	Basellaceae	Cutting
30	Dinda/Gharbhanda	<i>Leea asiatica</i>	Vitaceae	Cutting
31	Mokha	<i>Schrebera swietenoides</i>	Oleaceae	Cutting
32	Pendara	<i>Tamilnadia uliginosa</i>	Rubiaceae	Cutting
33	Bhokar	<i>Cordia dichotoma</i>	Boraginaceae	Sapling
34	Adulasa	<i>Justicia adhatoda</i>	Acanthaceae	Cutting

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Sr. No.	Local name	Botanical name	Family	Propagule Type
35	Awala	<i>Phyllanthus emblica</i>	Phyllanthaceae	Sapling
36	Kharbata	<i>Grewia abutilifolia</i>	Malvaceae	Cutting and Seeds
37	Sabarkand	<i>Euphorbia neriifolia</i>	Euphorbiaceae	Cutting
38	Dashmul	<i>Eranthemum roseum</i>	Acanthaceae	Sapling
39	Karwand	<i>Carissa carandas</i>	Apocynaceae	Sapling
40	Safet kuda	<i>Holarrhena pubescens</i>	Apocynaceae	Sapling and cutting
41	Temaru/Tembhurni	<i>Diospyros melanoxylon</i>	Ebenaceae	Sapling
42	Phatangadi/Amabat tingara/Ambati/Ambuti	<i>Embelia tsjeriam-cottam</i>	Primulaceae	Cutting
43	Ghansur	Unidentified		Sapling
44	Satputi	Unidentified	Cucurbitaceae	Seeds
45	Dodaka/Shirala	<i>Luffa acutangula</i>	Cucurbitaceae	Seeds
46	Jambhul	<i>Syzygium cumini</i>	Myrtaceae	Sapling
47	Behada	<i>Terminalia bellirica</i>	Combretaceae	Sapling
48	Kakad	<i>Garuga pinnata</i>	Burseraceae	Cutting
49	Ambadi	<i>Hibiscus cannabinus</i>	Malvaceae	Seeds
50	Bamboo	<i>Bambusa bambos</i>	Poaceae	Sapling
51	Bor	<i>Ziziphus jujuba</i>	Rhamnaceae	Seeds
52	Kadukand	<i>Dioscorea bulbifera</i>	Dioscoreaceae	Bulb
53	Chaikand	<i>Dioscorea alata</i>	Dioscoreaceae	Bulb
54	Vazkand	<i>Dioscorea hispida</i>	Dioscoreaceae	Buib
55	Khadaktera	<i>Ariopsis peltata</i>	Araceae	Bulb
56	Gugurvel/Malkangoni	<i>Celastrus paniculatus</i>	Celastraceae	Seeds
57	Lundhavel	<i>Dioscorea pentaphylla var. jacquemontii</i>	Dioscoreaceae	Bulb
58	Ulashi	<i>Dioscorea pentaphylla</i>	Dioscoreaceae	Bulb
59	Godkand/Moharu	<i>Dioscorea esculenta</i>	Dioscoreaceae	Bulb
60	Alu	<i>Colocasia esculenta</i>	Araceae	Bulb
61	Hirada	<i>Terminalia chebula</i>	Combretaceae	Seeds
62	Bibba	<i>Semecarpus anacardium</i>	Anacardiaceae	Seeds
63	Kali dhaman	<i>Grewia tiliifolia</i>	Malvaceae	Seeds
64	Chiranbhot	<i>Physalis minima</i>	Solanaceae	Sapling
65	Erand	<i>Ricinus communis</i>	Euphorbiaceae	Seeds
66	Tulas	<i>Ocimum tenuiflorum</i>	Lamiaceae	Seeds
67	Sol	<i>Cryptocoryne spiralis</i>	Araceae	Sapling
68	Baphali	<i>Heracleum grande</i>	Apiaceae	Seeds
69	Gela	<i>Catunaregam spinosa</i>	Rubiaceae	Cutting
70	Varas	<i>Heterophragma quadriloculare</i>	Bignoniaceae	Sapling and cutting
71	Konchi/Dighavadi	<i>Dioscorea wallichii</i>	Dioscoreaceae	Bulb
72	Ranwange	<i>Solanum anguivi</i>	Solanaceae	Seeds

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Sr. No.	Local name	Botanical name	Family	Propagule Type
73	Suran	<i>Amorphophallus paeoniifolius</i>	Araceae	Bulb
74	Gunj	<i>Abrus precatorius</i>	Leguminosae	Seeds
75	Tembrun	<i>Diospyros melanoxylon</i>	Ebenaceae	Sapling
76	Kala kuda	<i>Wrightia tinctoria</i>	Apocynaceae	Sapling





## Annexure IV: Nutritional analysis of the species

Table No. 18: Nutritional analysis of *Schrebera swietenoides*, *Leea macrophylla* and *Dioscorea wallichii*

Sr. No	Parameters	Methods	Result of Analysis			
			Greens of Mokha ( <i>Schrebera swietenoides</i> )	Mature leaves of Dinda ( <i>Leea macrophylla</i> )	Young leaves of Dinda ( <i>Leea macrophylla</i> )	Tender shoots of Dehagadi ( <i>Dioscorea wallichii</i> )
1	Total Fat	FSSAI Manual	1.51 g	0.97 g	0.65 g	0.53 g
2	Proteins	FSSAI Manual	5.39 g	3.44 g	3.49 g	2.96 g
3	carbohydrates	By Difference	10.89 g	8.9 g	7.9 g	12.07 g
4	Calorific Value	By Calculation	78.71 Kcal	58.09 Kcal	51.41 Kcal	64.89 Kcal
5	Moisture	FSSAI Manual	80.24 g	84.78 g	86.36 g	82.84 g
6	Ash	FSSAI Manual	1.97 g	1.91 g	1.6 g	1.6 g
7	Crude Fiber	FSSAI Manual	13.28 g	17.61 g	13.94 g	35.23 g
8	Free Sugars	Lane & eynon	Nil	Nil	Nil	Nil
9	Calcium	FCO	371 mg	170 mg	549 mg	104 mg
10	Phosphorous	FCO	0.21%	0.19%	0.37%	0.55%
11	Phosphorous as P <sub>2</sub> O <sub>3</sub>	FCO	0.48%	0.43%	0.85%	1.25%
12	Magnesium	By AAS	<1 mg	<1 mg	<1 mg	<1 mg
13	Potassium	Flame Photometer	5.1 ppm	6.2 ppm	5.6 ppm	7.2 ppm
14	Vitamin A	By AAS	255 IU	300 IU	270 IU	290 IU
15	Vitamin C	By AAS	12 mg	15.02 mg	13 mg	14.01 mg
16	Iron	By AAS	4.8 mg	3.4 mg	9.3 mg	6.0 mg
17	Starch	Lane & eynon	Nil	Nil	Nil	Nil

Table No. 19: Nutritional analysis for *Ariopsis peltata*, *Justicia procumbens*, *Athyrium hohenackerianum* and *Eleusine coracana*

Sr. No	Parameters	Methods	Result of Analysis			
			Greens of Khadaktera ( <i>Ariopsis peltata</i> )	Greens of Sharambal ( <i>Justicia procumbens</i> )	Greens of fern ( <i>Athyrium hohenackerianum</i> )	Greens of Nachni ( <i>Eleusine coracana</i> )
1	Moisture	IS 7874 Part I	85.53 g	85.03 g	91.33 g	85.14 g
2	Proteins	IS 7874 Part I	1.94 g	2.06 g	1.69 g	1.13 g
3	Ash	IS 7874 Part I	3.47 g	2.49 g	0.38 g	4.78 g
4	Total Fat	IS 7874 Part I	0.42 g	0.41 g	0.39 g	0.27 g
5	Crude Fiber	IS 7874 Part I	5.2 g	4.99 g	5.61 g	5.61 g
6	carbohydrates	By Calculation	3.64 g	5.02 g	0.6 g	3.07 g
7	Energy	By Calculation	26.1 Kcal	32.01 Kcal	12.67 Kcal	19.23 Kcal
8	Sugar	Lane & Eynon	Nil	Nil	Nil	Nil
9	Starch	ASTA	Nil	Nil	Nil	Nil
10	Calcium	IS 7874 Part II	450 mg	424 mg	193 mg	274 mg
11	Phosphorous	IS 7874 Part II	0.95 g	1.32 g	0.93 g	3.11 g
12	Magnesium	By AAS	41 g	5.05 mg	60.1 mg	50.15 mg
13	Iron	By AAS	182 mg	220 mg	43.1 mg	183 mg
14	Vitamin A	IP	7700 IU	7200 IU	5000 IU	-
15	Potassium	By Flame Photometer	8.4 ppm	6.2 ppm	5.2 ppm	9.7 ppm

## Annexure V: List of wild edible plants

Table No. 20: List of wild edible species of plants consumed by the tribes of Jawhar

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
1	Aagheda/ Achira	<i>Achyranthes aspera</i> L.	Amaranthaceae	Herb	Monsoon/ Winter	Wild/roads ide	Tender leaves and roots	Food and Medicinal	Tender leaves are soaked in water and cooked with onion and local masala.	Root powder extract is applied on tooth ache.
2	Aalambi/ Alimbi		Agaricaceae	Fungus	Monsoon	Wild	Whole mushroom	Food	Mushrooms are boiled & cooked with local spices.	
3	Abay/ Abai/ Chopdi	<i>Canavalia gladiata</i> (Jacq.) DC.	Leguminosae	Climber	Monsoon	Wild	Pods	Food	The young pods are boiled and are cooked with onion and chilli. The excess boiled water is drained.	
4	Adulsa	<i>Justicia adhatoda</i> L.	Acanthaceae	Shrub	Whole year	Cultivated	Leaves	Medicinal		Decoction of leaves used for cough.

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
5	Akri/ Akkadghad	<i>Athyrium hohenackerianum</i> T. Moore	Athyriaceae	Fern	Monsoon	Wild	Tender shoots	Food	Young shoots are boiled and cooked as vegetable.	
6	Aliv/ Alav	<i>Meyna laxiflora</i> Robyns	Rubiaceae	Tree	Summer/Rainy	Wild	Fruits	Food	Directly consumption of fruits	
7	Alu/Arabi/Tera / Teri	<i>Colocasia esculenta</i> (L.) Schott	Araceae	Herb	Monsoon	Wild and Cultivated	Leaves and Tuber	Food	1. Leaves are steamed and layered with gram flour to make local dish called "wadi". Green curry or "saag" is also prepared. 2. Tubers are boiled and cooked as vegetable.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
8	Amba	<i>Mangifera indica</i> L.	Anacardiaceae	Tree	Summer	Wild and Cultivated	Bark and Fruits	Food and Medicinal	Directly consumption of fruits	Bark decoction is used for stomachache
9	Ambadi	<i>Hibiscus cannabinus</i> L.	Malvaceae	Herb	Monsoon	Cultivated	Leaves and Fruits	Food and Medicinal	Initially leaves are dried and further boiled and cooked as vegetable. As it is sour to taste only small portion is added while cooking vegetables or curry or fish.	A small portion of the dried fruit is boiled and the water is consumed to cure cough or stomach infection.
10	Ambuti	<i>Begonia crenata</i>	Begoniaceae	Herb	Monsoon	Wild	Leaves	Food	Leaves are consumed directly or added in vegetable for its sour taste.	
11	Asand	<i>Bridelia retusa</i> (L.) A.Juss.	Phyllanthaceae	Tree	Monsoon/Winter	Wild	Fruits and Bark	Food and Medicinal	Directly consumption of ripe fruits.	Bark extract used for ear ache. Also

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
										effective on stomach ache.
12	Avala	<i>Phyllanthus emblica L</i>	Phyllanthaceae	Tree	Winter	Wild and Cultivated	Fruits and Stem	Food and Medicinal	Ripe fruits are consumed raw or pickled through sun drying.	Stem extract used in dental pain
13	Badade	<i>Arisaema murrayi</i> (J.Graham) Hook.	Araceae	Herb	Monsoon	Wild	Tuber	Food	Tubers are boiled and cooked.	
14	Bafali/ Baphali	<i>Heracleum grande</i> (Dalzell & A. Gibson) Mukhop.	Apiaceae	Herb	Monsoon	Wild	Leaves, roots and seeds	Food and Medicinal	1. Steamed leaves are saute on oil to make vegetable. 2. Seeds are used in chatani.	Seed powder and root decoction is used to cure stomach pain.
15	Bahava	<i>Cassia fistula L.</i>	Leguminosae	Tree	Summer	Wild	Flowers	Food	Flowers are boiled and cooked with onion and chillies and the water is drained after	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
									thoroughly after cooking.	
16	Bamboo/ Vasate	<i>Bambusa bambos</i> (L.) Voss	Poaceae	Herb	Monsoon	Wild	Shoots	Food	Young shoots used as a vegetable as well as preserved in the form of a pickle.	
17	Bandgul	<i>Dendrophthoe falcata</i> (L.f.) Ettiingsh.	Loranthaceae	Shrub	Winter	Wild	Fruits	Food	Fruits are consumed directly.	
18	Beheda	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Tree	Monsoon	Wild	Fruits and Seeds	Food and Medicinal	Seeds consumed raw by children only after the fruit dries and breaks. Too much consumption of seeds may give rise to acidity in children.	Powder of fruits is used on cough
19	Bel	<i>Aegle marmelos</i> (L.) Corrêa	Rutaceae	Tree	Summer	Wild	Fruits and Leaves	Food and Medicinal	Ripened fruits are directly consumed or	Bark decoction is used against

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
									added in Sharbat	dental pain.
20	Bhagar/Varai	<i>Panicum miliaceum</i> L.	Poaceae	Herb	Winter	Cultivated	Seeds	Food	1. Consumed as Soup 2. Seeds are boiled to prepare khichadi by adding local ingredients.	
21	Bharangi	<i>Rotheca serrata</i> (L.) Steane & Mabb.	Lamiaceae	Shrub	Monsoon	Wild	Leaves	Food	Young leaves are used to make vegetable.	
22	Bhokar	<i>Cordia dichotoma</i> G. Forst.	Boraginaceae	Tree	Summer	Wild	Fruits	Food	Raw fruits are pickled while Riped fruits are directly consumed	
23	Bhopla/ Bhopala/ Dangar/ Dongarbhaji	<i>Cucurbita maxima</i> Duchesne	Cucurbitaceae	Climber	Monsoon and winter	Cultivated	Fruits	Food	Fruits are boiled and cooked as a vegetable.	



Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
24	Bibba	<i>Semecarpus anacardium</i> L.f	Anacardiaceae	Tree	Summer	Wild	Fruits and Seeds	Food	1. Fleshy part of fruit is consumed directly. 2. Seeds known as Godambi are consumed raw.	
25	Bivala/ Beeja	<i>Pterocarpus marsupium</i> Roxb	Leguminosae	Tree	Whole year	Wild	Leaves and Bark	Food and Medicinal	Young leaves boiled and cooked used as vegetable.	Bark powder used to cure dental problem
26	Bondara	<i>Lagerstromea parviflora</i> Roxb.	Lytharaceae	Tree	Whole year	Wild	Leaves	Food	Tender leaves mixed with other wild vegetable and cooked to remove itchiness after taste.	
27	Bor	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Tree	Winter	Wild	Fruits	Food	Direct consumption of fruits	
28	Borod	<i>Echinochloa colona</i> (L.) Link	Poaceae	Herb	Monsoon	Wild	Seeds	Food	Seeds are used in the preparation of sweets.	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
29	Chaivel/ Chaikand/ Chayavel	<i>Dioscorea alata</i> L.	Dioscoreaceae	Climber	Monsoon	Cultivated	Tubers	Food	Tubers are boiled, cooked and consumed as vegetable.	
30	Chavali	<i>Vigna unguiculata</i> (L.) walp.	Leguminosae	Climber	Monsoon	Cultivated	Seeds	Food	Seeds are boiled and cooked as vegetable.	
31	Chibud/ Muskmelon	<i>Cucumis melo</i> L.	Cucurbitaceae	Climber	Summer	Cultivated	Fruit	Food	Fruits are consumed directly on ripening.	
32	Chinch	<i>Tamarindus indica</i> L.	Leguminosae	Tree	Summer	Wild and Cultivated	Fruits	Food	1. Ripe fruit are added in vegetables to add the sour flavor. 2. Riped fruits are consumed directly.	
33	Chirambot	<i>Physalis minima</i> L.	Solanaceae	Herb	Monsoon	Wild	Fruits	Food	Ripe fruits are consumed directly.	
34	Chirati	<i>Mukia maderaspatana</i> (L.) M.Roem.	Cucurbitaceae	Climber	Monsoon	Wild	Fruits	Food	Ripe fruits are consumed directly.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
35	Chunch/ Chuch/ Chinchnuk	<i>Corchorus olitorius</i> .L	Malvaceae	Herb	Monsoon	Wild	Leaves	Food	Young leaves are boiled and cooked as vegetable.	
36	Dauda	<i>Sterculia gutata</i> Roxb. ex G.Don	Malvaceae	Tree	Winter	Wild	Seeds	Food	Roasted seeds are consumed directly.	
37	Dehagadi/ Dighavadi/ Konchi	<i>Dioscorea wallichii</i> Hook.f.	Dioscoreaceae	Climber	Monsoon	Wild	Tender leaves and shoots	Food	Tender leaves and shoots are boiled and cooked with local masalas.	
38	Dhavda/ Dhamoda	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guillem. & Perr.	Combretaceae	Tree	Whole year	Wild	Gum	Food	Gum is edible and added in various curries and vegetables.	
39	Dhayati	<i>Woodfordia fruticosa</i> (L.) Kurz	Lytharaceae	Shrub	Winter	Wild	Flowers	Food	Flowers are not only used to extract nectar but they are also cooked and consumed.	
40	Dudhi	<i>Lagenaria siceraria</i> (Molina) Standl.	Cucurbitaceae	Climber	Monsoon	Cultivated	Fruits	Food	Fruits are boiled and cooked as a vegetable.	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
41	Erand	<i>Ricinus communis</i> L.	Euphorbiaceae	Shrub	Whole year	Wild	Seeds	Medicinal		Oil is extracted from the seeds of Erand which are used as laxative during stomach problems.
42	Fanas	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	Tree	Summer	Wild and Cultivated	Fruits	Food	Direct consumption of fruits.	
43	Fatangadi/ Phangota/ Phatangdi/ Ambat tingra	<i>Embelia tsjerium-cottam</i> (Roem. & Schult.) A.DC.	Primulaceae	Shrub	All season	Wild	Leaves and Seeds	Food and Medicinal	Leaves boiled and cooked as vegetable using local masalas.	Seeds are consumed during stomach pain.
44	Gagola	<i>Ipomoea muricata</i> (L.) Jacq.	Convolvulaceae	Climber	Monsoon	Wild	Fruits	Food	Fruits are consumed only after removal of the seed and stir fried with onion and local masalas to make vegetable.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
45	Gala/ Gela Ghela/ Gal	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	Rubiaceae	Tree	Monsoon	Wild	Tender fruits	Food	Tender fruits are boiled and cooked in niger seeds and local masala to be consumed as vegetable.	
46	Garbhanda	<i>Leea asiatica</i>	Vitaceae	Shrub	Monsoon	Wild	Leaves	Food	This wild edible was recorded in Jawhar but the tribe donot consume the same. In other parts of Maharashtra, the leaves are cooked and consumed.	
47	Garbhend	<i>Thespesia lampas</i>	Malvaceae	Shrub	Monsoon	Wild	Roots	Medicinal		The roots decoction is consumed during yellow urination.

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
48	Gavar	<i>Cyamopsis tetragonoloba</i> (L.) Taub.	Leguminosae	Shrub	Winter	Cultivated	Fruits	Food	Legumes boiled and cooked as vegetable.	
49	Gavathi udid	<i>Vigna mungo</i> (L.) Hepper	Leguminosae	Herb	Monsoon	Cultivated	Seeds	Food	Seeds are cooked in the form of curry or vegetable.	
50	Gholu	<i>Portulaca oleracea</i> L	Portulacaceae	Herb	Rainy/ Winter	Wild	Leaves	Food	Leaves are boiled and cooked as vegetable.	
51	Ghugurval	<i>Flacaurtia indica</i> (Burm.f.) Merr.	Salicaceae	Tree	Monsoon	Wild	Fruits	Food	Direct consumption of fruits.	
52	Girjala	<i>Marsilea quadrifolia</i> L.	Marsileaceae	Herb	Monsoon/ Winter	Water body	Leaves	Food	Leaves are boiled and cooked as vegetable.	
53	God Kanda/ Karanda	<i>Dioscorea esculenta</i>	Dioscoreaceae	Climber	Monsoon	Wild and Cultivated	Bulbil and Tuber	Food	Bulbils and tubers are boiled and cooked as vegetable.	
54	Gometi	<i>Solena amplexicaulis</i> (Lam.) Gandhi	Cucurbitaceae	Climber	Monsoon	Wild	Tuber	Medicinal		Tuber powder is used to increase the appetite

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
										in children.
55	Gulvel	<i>Tinospora sinensis</i> (Lour.) Merr.	Menispermaceae	Climber	Monsoon	Wild	Stem	Medicinal		Stem decoction consumed during acidity and heat problem.
56	Gunj	<i>Abrus precatorius</i> L.	Leguminosae	Climber	Monsoon	Wild	Leaves	Food and Medicinal	Leaves are directly consumed after meal.	Leaves used as medicinal on cough and helps in digestion
57	Halad	<i>Curcuma longa</i> L.	Zingiberaceae	Herb	Whole year	Cultivated	Rhizome	Food	Rhizome powder used in daily cooking.	
58	Halinda	<i>Vigna vexillata</i> (L.) A.Rich.	Leguminosae	Climber	Annual	Wild	Tuber	Food	Tuber is consumed raw or is boiled and cooked as vegetable.	
59	Hirda	<i>Terminalia chebula</i> Retz.	Combretaceae	Tree	Monsoon	Wild	Fruits	Medicinal		Fruit powder is used on cough.

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
60	Humb	<i>Milium tomentosum</i> (Roxb.) J.Sinclair	Annonaceae	Tree	Summer	Wild	Fruits	Food	Ripe fruits are consumed directly.	
61	Jambhul	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Tree	Summer	Wild	Fruits	Food	Ripe fruits are consumed directly.	
62	Jangali Kanda	<i>Drimys indica</i> (Roxb.) Jessop	Asparagaceae	Herb	Whole year	Wild	Bulb	Medicinal		Juice of the bulb is used on piles.
63	Jungli Suran/ Loth/ Shevala	<i>Amorphophallus commutatus</i> (Schott) Engl.	Araceae	Herb	Monsoon	Wild	Tuber, Tender leaves and Stem	Food	1. Tubers are boiled and cooked as vegetable. 2. Tender leaves (Loth) are steamed and cooked with onion & garlic. Leaves of 'Bondar' are added while cooking to remove the itchiness. The leaves are also dried and stored	



Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
									for off season consumption 3. Tender stem (Shevala) is cooked as vegetable.	
64	Jwari	<i>Sorghum bicolor</i> (L.) Moench	Poaceae	Herb	Winter	Cultivated	Seeds	Food	Powdered seeds are mixed with water to make bread.	
65	Kadu nimb	<i>Azadirachta indica</i> A.Juss.	Meliaceae	Tree	Whole year	Wild	Leaves	Medicinal		Leaves decoction is used for dental care.
66	Kadukand/ Dukkarkand	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Climber	Monsoon	Wild	Tuber	Food	Tuber is kept overnight in the river dissolve the	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
									bitter taste. It is then boiled and consumed.	
67	Kahandal	<i>Firmiana simplex</i> (L.) W.Wight	Malvaceae	Tree	Winter	Wild	Seeds and Gum	Food	1. Seeds are roasted and consumed. 2. The gum of the plant is also consumed by adding it in various food items.	
68	Kaharul	<i>Bauhinia purpurea</i> L.	Leguminosae	Tree	Winter	Wild and Cultivated	Young leaves and Buds	Food	Young leaves and buds are consumed as vegetable.	
69	Kakad/ Kakhodshi	<i>Garuga pinnata</i> Roxb.	Burseraceae	Tree	Summer	Wild	Fruits	Food	Fruits are consumed directly and also prepared as pickle.	
70	Kakdi	<i>Cucumis sativus</i>	Cucurbitaceae	Climber	Summer/Rainy	Cultivated	Fruits	Food	Direct consumption of fruits	
71	Kala kuda	<i>Wrightia tinctoria</i> R.Br.	Apocynaceae	Tree	Summer	Wild	Flowers	Food	Flowers are boiled and cooked in local masalas as vegetable.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
72	Kali dhaman	<i>Grewia tillifolia</i> Vahl.	Malvaceae	Tree	Summer	Wild	Fruits, Bark and Roots	Food and Medicinal	Direct consumption of fruits.	1. Root extract used during stomach ache. 2. Bark decoction is used on piles and bones joints.
73	Kali musali	<i>Curculigo orchiodes</i> Gaertn.	Hypoxidaceae	Herb	Monsoon	Wild	Roots	Medicinal		Root decoction is useful in treatment of piles, joint pain and so on.
74	Kamal kakadi	<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Herb	Whole year	Wild	Seeds	Food	Roasted seeds are consumed.	
75	Kardai	<i>Argemone mexicana</i>	Asteraceae	Herb	Summer	Wild and Cultivated	Seeds	Food	Seeds are crushed to extract edible oil.	
76	Karli/ Karle/ Karavli	<i>Momordica charantia</i> L.	Cucurbitaceae	Climber	Monsoon	Cultivated	Fruits	Food	Fruits are boiled &	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
									cooked as vegetable.	
77	Kartoli	<i>Momordica dioica</i> Roxb. ex Willd.	Cucurbitaceae	Climber	Monsoon	Wild	Fruits	Food	Fruits are boiled & cooked in oil as vegetable.	
78	Karval/ Karmal	<i>Dillenia pentagyna</i> Roxb.	Dilleniaceae	Tree	Summer	Wild	Flowers	Food	Flowers are used in preparation of vegetable.	
79	Karvand/ Karvanda	<i>Carissa carandas</i> L.	Apocynaceae	Shrub	Summer	Wild	Fruits	Food	Fruits are consumed directly while raw fruits are also used in pickles.	
80	Kate Math	<i>Amaranthus spinosus</i>	Amaranthaceae	Herb	Monsoon	Wild	Leaves	Food	Leaves are fried and cooked in oil and masalas as vegetable.	
81	Katesawar	<i>Bombax ceiba</i> L.	Malvaceae	Tree	Summer	Wild	Flowers	Food	Flowers are boiled and cooked as vegetable.	
82	Kavadar	<i>Ensete superbum</i> (Roxb.) Cheesman	Musaeae	Herb	Monsoon	Wild	Flowers and stem	Food	Stem and flower are boiled and consumed as a vegetable.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
83	Kaval amba	<i>Trichosanthes tricuspidata</i> Lour.	Cucurbitaceae	Climber	Monsoon	Wild	Roots	Medicinal		Roots decoction consumed during urinary infection.
84	Kavisha/ Kavisa	<i>Firmiana colorata</i>	Malvaceae	Tree	Whole year	Wild	Bark	Medicinal		Bark decoction used during urine infection and stomach pain.
85	Kawla	<i>Smithia conferta</i> Sm.	Leguminosae	Herb	Monsoon	Wild	Leaves	Food	Young leaves cooked with spices as vegetable.	
86	Keni	<i>Commelina benghalensis</i> L.	Commelinaceae	Herb	Monsoon	Wild	Leaves	Food	Young Leaves boiled and cooked in oil as vegetable.	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
87	Khadaktera/ Teralu	<i>Ariopsis peltata</i> Nimmo	Araceae	Herb	Monsoon	Wild	Leaves	Food	1. Leaves cooked as vegetable with oil and onion. 2. Leaves are rolled to make vadi along with chana paste. 3. Leaves directly added to dal as garnish.	
88	Khajur/ Shindi	<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Tree	Summer	Wild	Fruits and Bark sap	Food	Fruits are consumed directly while the sap is consumed as Madi/Neera (Local alcohol).	
89	Kharbat/ Kharbati/ Karbat	<i>Grewia abutilifolia</i>	Malvaceae	Shrub		Wild	Fruits	Food	Direct consumption of fruits.	
90	Kharsheng	<i>Radermachera xylocarpa</i> (Roxb.) Roxb. ex K.Schum.	Bignoniaceae	Tree	Monsoon	Wild	Fruits	Food	Young pods are boiled to remove bitterness and cooked as vegetable.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
91	Khurasani/ Khurasni	<i>Guizotia abyssinica</i> (L.f.) Cass.	Compositae	Herb	Summer	Cultivated	Seeds and Leaves	Food	1. Oil is extracted from seeds. 2. Tender leaves steamed and cooked with local masalas.	
92	Koprya	<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Amaranthaceae	Herb	Monsoon	Wild	Leaves	Food	Leaves are boiled and cooked as vegetable.	
93	Vazkand	<i>Dioscorea hispida</i>	Dioscoreaceae	Climber	Monsoon	Cultivated	Tuber	Food	Tubers are boiled and cooked as vegetable.	
94	Koshimb/ Koshim/ Kusum	<i>Schleichera oleosa</i> (Lour.) Oken.	Sapindaceae	Tree	Winter	Wild	Leaves and Seeds	Food and Medicinal	Seed oil is used in vegetable.	Leaves decoction given for vomiting.
95	Kothambal/ Kothimbir	<i>Coriandrum sativum</i> L.	Apiaceae	Herb	Whole year	Cultivated	Leaves	Food	Leaves cooked as vegetable or consumed directly by adding in the curry or as garnish.	
96	Kudie/Kuda/ Kod/ Kudva	<i>Holarrhena pubescens</i>	Apocynaceae	Shrub	Winter	Wild	Flowers	Food	Flowers are boiled and	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
		Wall. ex G.Don							cooked as vegetable.	
97	Kuharool/ Shid	<i>Bauhinia racemosa</i>	Leguminosae	Tree	Winter	Wild	Leaves	Food	Leaves are boiled and cooked as vegetable.	
98	Kuli/ Kovali bhaji	<i>Chlorophytum tuberosum</i> (Roxb.) Baker	Asparagaceae	Herb	Monsoon	Wild	Young leaves	Food	Leaves are boiled and cooked as vegetable.	
99	Kumbha	<i>Careya arborea</i> Roxb.	Lecythidaceae	Tree	Annually	Wild	Bark	Medicinal		Bark powder is consumed during stomach pain
100	Kurdu	<i>Celosia argentea</i> L.	Amaranthaceae	Herb	Monsoon	Wild	Leaves	Food	Young leaves are steamed and cooked with onion and local masalas as vegetable.	
101	Kusar	<i>Jasminum malabaricum</i> Wight	Oleaceae	Climber	Monsoon	Wild	Fruits	Food	Fruits are consumed directly.	



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102	Lokhandi	<i>Ixora brachiata</i> Roxb.	Rubiaceae	Tree	Whole year	Wild	Leaves	Medicinal		Leaf powder is consumed during cough.
103	Lundha	<i>Dioscorea pentaphylla</i> var. <i>jacquemontii</i>	Dioscoreaceae	Climber	Monsoon	Wild	Young shoots and tubers	Food	1. Tubers are boiled and cooked as vegetable. 2. Young shoots are also boiled and cooked as vegetable.	
104	Maswadi	<i>Ocimum sps</i>	Lamiaceae	Herb		Cultivated	Leaves	Food	Leaves used in Chatani preparation	
105	Math bhaji/ Getna	<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Herb	Monsoon	Field	Leaves	Food	Young leaves are steamed and stir fried with onion, garlic and chilli to make the vegetable.	
106	Mayalu	<i>Basella alba</i> L.	Basellaceae	Climber	Monsoon	Cultivated	Leaves	Food	Leaves are specially used to make pakodas. It is also	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
									consumed as a vegetable or added in curry preparation.	
107	Meki	<i>Cucumis setosus</i>	Cucurbitaceae	Climber	Monsoon	Wild	Fruits	Food	Raw fruits are consumed directly.	
108	Moha/ Moh/ Mohati	<i>Madhuca longifolia</i> var. <i>latifolia</i> (Roxb.) A.Chev.	Sapotaceae	Tree	Summer	Wild	Seeds and flowers	Food	1. Flowers are cooked and consumed as vegetable. 2. Seeds are crushed for oil.	
109	Mokha/Mukhpa la/ Moka	<i>Schrebera swietenoides</i> Roxb.	Oleaceae	Tree	Late Summer	Wild	Fruits and Leaves	Food	Young leaves and fruits boiled and cooked as vegetable.	
110	Morvel	<i>Clematis gouriana</i>	Ranunculaceae	Climber	Monsoon	Wild	Fruits	Food and Medicinal	Leaves boiled and cooked with spices	Fruit extract used in ear ache
111	Murud sheng/ Aati	<i>Helicteres isora</i> L.	Malvaceae	Shrub	Summer	Wild	Pods	Medicinal		1. Fruit decoction is used for stomach pain

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
										2. Crushed powder is consumed with water on scorpion bite.
112	Nachani/ Nagli	<i>Eleusine coracana</i> (L.) Gaertn.	Poaceae	Herb	Monsoon	Cultivated	Flowers	Food	Grain powder is mixed with water and used for making 'bread'.	
113	Nadukali	<i>Pavetta indica</i> L.	Rubiaceae	Shrub	Summer	Wild	Flowers	Food	Flower are boiled and cooked as vegetable.	
114	Nalbhaji	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae	Climber	Winter	Water body	Leaves and Stem	Food	Leaves and stems are cooked with onion and local masala as vegetable.	
115	Nilgiri	<i>Eucalyptus globulus</i>	Myrtaceae	Tree	Whole year	Wild	Leaves	Medicinal		Leaf extract used on dental problem

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
										and also used in common cold and cough.
116	Nirgudi	<i>Vitex negundo</i> L.	Lamiaceae	Shrub	Whole year	Cultivated	Leaves	Medicinal		Leaf extract used for ear pain.
117	Ova	<i>Plectranthus amboinicus</i> (Lour.) Spreng.	Lamiaceae	Herb	Whole year	Cultivated	Leaves	Food	Leaves used to make pakodas and aslo added in curries for taste.	
118	Palas	<i>Butea monosperma</i> (Lam.) Taub.	Leguminosae	Tree	Winter	Wild	Flowers and bark	Food and Medicinal	Flowers are used to make vegetable.	Branch decoction is used for sore throat.
119	Papai	<i>Carica papaya</i> L.	Caricaceae	Tree	Whole year	Cultivated	Fruit	Food and Medicinal	Fruits are consumed directly on ripening.	Milky latex is used during dental problem.
120	Papdi	<i>Holoptelea integrifolia</i> Planch.	Ulmaceae	Tree	Summer	Wild	Seeds	Food and Medicinal	Seeds are edible and consumed directly	Bark extract is used for dental curies.

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
121	Pavata	<i>Lablab purpureus</i>	Leguminosae	Climber	Winter	Cultivated	Seeds	Food	Seeds are cooked as vegetable.	
122	Pave	<i>Cheilocostus speciosus</i> (J.Koenig) C.D.Spech	Costaceae	Herb	Monsoon	Wild	Leaves and Stem	Food	Tender leaves and stem are added to curry directly.	
123	Pendara/ Pendhar	<i>Tamilnadia uliginosa</i> (Retz.)	Rubiaceae	Tree	Winter	Wild	Fruits	Food	Young fruits boiled and cooked for consumption.	
124	Pimpal	<i>Ficus religiosa</i>	Moraceae	Tree	All season	Wild	Bark	Medicinal		Bark powder is consumed during stomach pain.
125	Ran shegut	<i>Moringa concanensis</i> Nimmo	Moringaceae	Tree	Whole year	Wild	Bark and Pods	Food and Medicinal	Pods are boiled and cooked with local masala as vegetable.	Bark decoction use in worm infection.
126	Ran til	<i>Sesamum indicum</i> L.	Pedaliaceae	Herb	Monsoon	Cultivated	Seeds	Food	The seeds of the plants are crushed to extract edible oil.	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
127	Ranvanga	<i>Solanum anguivi Lam.</i>	Solanaceae	Shrub	Monsoon and Winter	Wild	Fruits	Food	Fruits are cooked and stir fried with onion, garlic and chilli.	
128	Ratalu/ Ratala	<i>Ipomoea batatas (L.) Lam.</i>	Convolvulaceae	Climber	Whole year	Cultivated	Tuber	Food	Tubers are boiled and cooked as vegetable.	
129	Ringani/ Ringni	<i>Solanum xanthocarpum</i>	Solanaceae	Herb	Monsoon	Wild, mostly near water bodies	Fruits	Food	Fruits cooked and consumed as vegetable.	
130	Sabar/ Sabarkand	<i>Euphorbia nerifolia L.</i>	Euphorbiaceae	Shrub	Whole year	Wild	Stem	Medicinal		Stem decoction is consumed during cough.
131	Sadhadi/ Aine	<i>Terminalia tomentosa/ crenulata</i>	Combretaceae	Tree	Whole year	Wild	Fruits	Food	Young fruits are edible.	
132	Safed kuda	<i>Holarrhena antidysenterica</i>	Apocynaceae	Tree	Summer	Wild	Flowers	Food	Flower are boiled and cooked as vegetable.	

Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
133	Sag	<i>Tectona grandis</i>	Lamiaceae	Tree	All season	Wild	Seeds	Medicinal		Powder of seeds is mixed with water and consumed for kidney stone & Renal problems.
134	Sapud/ Dinda/ Dini	<i>Leea macrophylla</i> Roxb. ex Hornem.	Vitaceae	Shrub	Winter	Wild	Leaves	Food	Tender leaves are cooked with spices as vegetable.	
135	Sarambal	<i>Justicia procumbens</i> L.	Acanthaceae	Herb	Monsoon	Wild	Leaves	Food	Young leaves boiled and cooked as vegetable.	
136	Shevaga/ Shevga/ Sagava/ Shegalu	<i>Moringa oleifera</i> Lam.	Moringaceae	Tree	Whole year	Cultivated	Flowers, Fruits and Leaves	Food	Young leaves, fruits and flowers are cooked and consumed as vegetable.	
137	Siral/ Dodka	<i>Luffa acutangula</i> (L.) Roxb.	Cucurbitaceae	Climber	Monsoon	Cultivated	Fruit	Food	Fruit cooked as vegetable.	

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Sr. No	Local Name of Species	Scientific Name	Family	Habit	Season of availability	Habitat	Plant part used	Significance as per villagers	Recipe	Medicinal information
138	Sol	<i>Cryptocoryne spiralis</i> (Retz.) Fisch. ex Wydler	Araceae	Herb	Monsoon	Wild	Young leaves	Food	Leaves are mixed with Chana flour to make vadi and then consumed.	
139	Supali	<i>Cleome viscosa</i> L.	Cleomaceae	Herb	Monsoon	Wild	Pod	Medicinal	Pods are boiled and cooked as vegetable.	
140	Suran	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Araceae	Herb	Monsoon	Cultivated	Tubers	Food	Tubers are boiled and fried with local masala as vegetable.	
141	Tadgole	<i>Borrassus flabellifer</i> L.	Arecaceae	Tree	Summer	Wild	Fruits	Food	Fruits are consumed directly.	
142	Tagadi/ Tagda/ Taag	<i>Crotalaria juncea</i> L.	Leguminosae	Shrub	Monsoon	Wild	Flowers	Food	Flowers are boiled and cooked as vegetable.	
143	Tambat/ Atrun/ Gugarval	<i>Flacourtia indica</i> (Burm.f.) Merr.	Salicaceae	Tree	Monsoon	Wild	Fruits	Food	Fruits are consumed directly.	
144	Tandala	<i>Amaranthus tricolor</i> L.	Amaranthaceae	Herb	Monsoon	Cultivated	Plant	Food	Leaves are boiled and cooked as vegetable.	



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145	Tantani	<i>Lantana camara</i> L.	Verbenaceae	Shrub	Winter	Wild	Fruits	Food	Fruits are consumed directly.	
146	Tanvel	<i>Cocculus hirsutus</i> (L.) W.Theob.	Menispermaceae	Climber	Monsoon	Wild	Leaves	Food	Leaves boiled and cooked in oil as vegetable.	
147	Taravata/ Tarota/ Takhata/ Atora	<i>Senna tora</i> (L.) Roxb.	Leguminosae	Herb	Monsoon	Wild	Leaves and Seeds	Food	1. Young leaves boiled and cooked as vegetable. 2. Seeds roasted and powdered to prepare coffee powder and then consumed with boiled water or milk.	
148	Tehra/ Terda	<i>Impatiens balsamina</i> L.	Balsaminaceae	Herb	Monsoon	Wild	Young leaves	Food	Young leaves used as vegetable	
149	Tembhruni/ Tembhurni/ Tembrun	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae	Tree	Summer	Wild	Fruits	Food	Fruits are consumed directly.	

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150	Tetava/ Tetavi/ Tetu	<i>Oroxylum indicum</i> (L.) Kurz	Bignoniaceae	Tree	Early Summer	Wild	Young pods and Bark	Food and Medicinal	Young pods are boiled and cooked to make vegetable.	Bark decoction is effective in urinary infection
151	Tivas	<i>Desmodium oojeinense</i> (Roxb.) H.Ohashi	Leguminosae	Tree	Annual	Wild	Flowers	Food and Medicinal	Flowers are boiled and cooked as vegetable.	Bark decoction helps in balancing the blood pressure level
152	Tondali/ Tondval	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Climber	Monsoon	Cultivated	Fruits	Food and Medicinal	Fruits boiled and cooked as vegetable.	Milky latex is used for mouth ulcer
153	Toran	<i>Ziziphus rugosa</i> Lam.	Rhamnaceae	Climber	Summer	Wild	Fruits	Food	Fruits are consumed directly.	
154	Tulas/ Tulasi/ Krushnatulas	<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Herb	Whole year	Cultivated	Leaves	Food and Medicinal	Tulsi leaves are added while making tea to add flavour	Leaf extract is consumed during headaches and coughs.

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155	Udid	<i>Vigna radiata</i> (L.) R.Wilczek	Leguminosae	Climber	Monsoon	Cultivated	Seeds	Food	Seeds are boiled with local masalas to prepare curry.	
156	Ulashi/ Udsha/ Ulushi	<i>Dioscorea pentaphylla</i> var. <i>Pentaphylla</i>	Dioscoreaceae	Climber	Monsoon	Wild	Tender shoots, leaves and tuber	Food	1. Tubers are boiled and consumed as vegetable. 2. Tender shoots are steamed and stir fried with onion and local masalas.	Leaf extract is given as paste during iron deficiency.
157	Umbar/ Umber/ Athi	<i>Ficus racemosa</i> L.	Moraceae	Tree	Whole year	Wild	Fruits	Food	Raw fruits used to make vegetable while ripe fruits are consumed directly.	
158	Usiver	<i>Cayratia japonica</i>	Vitaceae	Climber	Monsoon	Wild	Flowers	Food	Flowers are cooked as vegetables.	
159	Vad	<i>Ficus benghalensis</i> L.	Moraceae	Tree	Monsoon	Wild	Fruits	Medicinal		Fruits are consumed during stomach pain.

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160	Vaghot/ Vaghat/ Vaghoti/ Ekota/ Kaposhi	<i>Capparis zeylanica</i> L.	Capparaceae	Climber	Winter	Wild	Fruits	Food	Raw fruits are cooked and consumed as vegetable.	
161	Vela karanj	<i>Derris scandens</i> (Roxb.) Benth.	Leguminosae	Climber	Monsoon	Wild	Tuber	Medicinal		Tuber decoction is given to lactating mothers.
162	Wal	<i>Lablab purpureus</i>	Fabaceae	Climber	Monsoon	Cultivated	Seeds	Food	Seeds are boiled and cooked as vegetable.	
163	Zendu	<i>Tagetes erecta</i> L.	Compositae	Herb	Whole year	Cultivated	Leaves	Medicinal		Juice of leaves is used to cure eye infection



*Concerned divisions / project related brief note to be included here*