SWAYAMSIDDHA PROJECT

ECOHEALTH RESEARCH

Diversity of Food Sources and Practices among tribal of Vansda block

[District Navsari, South Gujarat]

Research under taken by

DHRUVA

Vrindavan Campus, Lachakadi,
Taluka Vansda, District Navasari,
Gujarat

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This report is prepared by Ms. Rashmi Dixit along with DHRUVA & BAIF Swayamsiddha Project teams.

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TABLE OF CONTENTS

List of Tables

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Ms. Rashmi Dixit , Research Associate, Swayamsiddha Project

LIST OF ACRONYMS

ATG	Agricultural Technical Group
BAIF	BAIF Development Research Foundation
CBO	Community Based Organization
CIDA	Canadian International Development Agency
CPCT	Central Project Coordination Team
FGD	Focus Group Discussion
FTO	First Tier Organization
FTW	First Tier Women – members of FTO
IDRC	International Development Research Centre
IGA	Income Generation Activity
MANDSPA	Manibhai Desai Ayurvardhin Farmacy for Adivasis
PCT	Project Cluster Team
PHC	Primary Health Center
PRA	Participatory Rural Appraisal
SHG	Self Help Groups
TBA	Traditional Birth Attendants
THP	Traditional Health Practitioner
VHG	Village Health Guide

ABOUT DHRUVA

DHRUVA is a sister organization of BAIF Development Research Foundation (BAIF), promoted in 1995 to work with tribal populations in South Gujarat. DHRUVA implements various development programmes in Navsari, Valsad and Dangs districts of South Gujarat.

DHRUVA consistently seeks to introduce appropriate innovative interventions to improve livelihood opportunities for the tribal poor. While implementing its multidisciplinary development programs, DHRUVA emphasizes strengthening the symbiotic relationship between development and environment. A number of effective approaches have evolved over the years, which focus on the following three aspects:

- Protection and development of natural resources,
- Dissemination of knowledge and science & technology,
- Sustainable Development through People's Participation.

The DHRUVA staff enjoys a good rapport and support of the local communities, Kukana, Kotwalia, Kolcha, and Varli; and is supported by a tribal producers' Cooperative, "Vasundahra Vriksha Van Wadi Jal Sinchan Sahakari Mandali".

The "Wadi", meaning orchard in Gujarati, is DHRUVA's pioneering program. Promoting *Wadi,* i.e. plantation of agricultural, horticultural and forestry species on one acre of land is the main activity of DHRUVA. Over the last 10 years, the "Wadi" has proven to be a successful model of making a family economically self-sufficient. A number of other land-based livelihood interventions such as mango grafting, vegetable nursery, and mushroom cultivation also contribute to poverty alleviation of tribal families in this area.

DHRUVA has demonstrated how needs based land use can first make a family 'food secure' and then bring it above the poverty line. DHRUVA extends agricultural, technical, credit and marketing support to the Vasundhara Cooperative.

DHRUVA reaches out to more than 50,000 tribal families and has helped develop over 60,000 acres of land. But more importantly, it has a number of People's Organizations (SHGs and Ayojan Samitees) and is today known as a path maker organization in the area of sustainable development.

DHRUVA implemented the *Swayamsiddha* project since July 2000. The project covered eight villages located at a distance of 2 km. to 20 km. from it's headquarter in Vansda, situated in Navsari district of South Gujarat.

ABOUT SWAYAMSIDDHA

"Swayam" means self, and "*siddha"* means “one who has proven capability” or is “empowered”. Thus *Swayamsiddha* connotes a group of self-reliant and empowered women. Having realized that women's needs often become sidelined in development programs and service delivery, a group of organizations came together to conceptualise this project with the aim of empowering women to influence decision making processes related to their development.

The driving force behind the project conception was a strong felt need to consolidate approaches for empowering women and enhancing them to bring women at the centre of development. The organizations involved in the project implementation recognized the need to better understand how to be responsive to women's needs and underlying gender issues, and decided to work together and share one’s learning with each other.

The project purpose and expected results (the log frame) were prepared through a consultative process between partner institutions and a participatory needs assessment study with project communities. The overall purpose is to “initiate and support processes that make women self-reliant and empowered in addressing their needs”. At the institutional level, a key goal is that partner organizations adopt these processes across their programs and projects. As women’s needs and underlying gender issues vary from place to place, the project has an inherent characteristic of flexibility in its approach and interventions. There is emphasis on involving Community Based Organizations (CBO) in planning and implementation and thus the speed of implementation varies from place to place, and from time to time. In spite of local specificities, however, the overall purpose and approaches are common across locations.

Capacity building of women, fostering the creation and/or strengthening of locally driven CBOs and linking them with mainstream organizations form the key strategy of the entire project teams. Given the fact that in rural India there is hardly any platform available for local women to come together and express themselves, the emphasis in the project design is on reaching out to women individually, forming local groups, and then gradually strengthening them into CBOs. A lead group of "Swayamsiddha" (i.e. capable women) is considered crucial to formation of CBOs that will take the mandate of addressing women's self identified needs seriously. Similarly organizing men, children, and youth, is also considered essential to support the change process.

The 'Swayamsiddha' project is a multi-institutional initiative to foster and strengthen gender responsive development processes in 9 locations, across 6 states in India. The project is coordinated by the BAIF Development Research Foundation (BAIF) through a Central Project Coordination team (CPCT) and

implemented by nine organizations. CIDA and IDRC co-fund the project. IDRC is the Executing Agency for this Canadian Development Assistance.

CHAPTER 1 - INTRODUCTION

DHRUVA works in Valsad, Navsari, Dharampur and Dangs in South Gujarat. This is a tribal belt, predominantly inhabited by Kukana, Kolcha, Kotwadiya and Warli communities. These communities were dependent on forests for their livelihood until a few decades ago. Their diet was comprised primarily of forest-based sources, tubers, fruits, mushrooms, fish, locally brewed Mahua liquor, and minor millets grown for subsistence. They also collected and traded forest produce such as Mahua seeds, Mahua flowers, fuel wood, medicinal herbs, tendu patta, in exchange of salt, sugar, and other necessities. Thus, forests contributed to the sustenance of local communities.

However, the forests started receding, especially after the independence owing to over use, inadequate regeneration, and statutory ownership of forests. Increase in population requiring housing, demand for timber, leading to cutting big trees and increase in cultivation resulted in thinning of forests and reduced biodiversity. Along with reduction in forest cover, surface water bodies became seasonal and ground water level started receding. As a consequence, the range of foodstuffs once available locally, started disappearing very fast. This increased the area under cultivation of grains – rice, finger millets, and pulses. The need to look for alternative sources of livelihood outside the region became evident. Working for wages in nearby towns was one option that many resorted to, at least seasonally. This brought cash in their hands and more food choices became available through market purchases. Their need and passion for forests foods thus started reducing. Unearthing tubers, collecting seeds, catching crabs or fishing became more of a pass time activity.

We still find older persons yearning for the lost ways of life. They know how to access the forests and possess knowledge of processing the exotic species to preserve and eat. Unfortunately, the younger generation is unaware of this information. The knowledge of forest food sources is not documented in local language and DHRUVA does not know of any specific attempts to regain or recuperate these food sources by the local communities.

One likely consequence of all these factors is a higher incidence of malnutrition – at least according to the local women. Not only women and girls, but men and boys too suffer from symptoms indicative of anaemia and nutrition deficiencies. Weakness, feeling tired, leg pain, and back pain, are common complaints, which women recognize as the result of malnutrition. That is why, when the Swayamsiddha Project decided to study one local health problem - malnutrition was opted by women here too, as did women in the other locations of Swayamsiddha.

Swayamsiddha emphasised women's involvement in the process of planning and conducting the study, as a route of empowerment. A participatory mapping

exercise was conceived to solicit women's perceptions about factors contributing to malnutrition, (see more about mapping in the next section). Women underlined the relationship between availability of diverse food sources and nutritional status.

A process of documenting available food sources thus began in the Swayamsiddha Project in April 2002, and the data collection concluded in 2004. This document captures the process of information gathering on indigenous food sources and lists in a separate document, the food sources and recipes as described by the local community and women in particular. It will be translated in the local dialect for sharing the inferences at the community level for their action.

CHAPTER 2 - JUSTIFICATION OF THE STUDY

I. Malnutrition reflects poor human as well as ecosystem health

Life cannot exist without food, and striving to fulfil food needs is the primary instinct of all living organisms. Animals depend for their food on plants and/or other animals. All animals satisfy their food requirements through natural selection. “Survival instinct”, and hierarchy of species, determine the natural selection.

‘Human beings’ access the widest food range among all the animals. This is mainly due to the fact that human beings have learnt to preserve and process food to suit their taste, needs, and future food security. They also cultivate their food. In fact, “Food diversity” of a community reflects their culture and advancement.

Food & Environment

The choice of food depends on its availability, which is in turn a function of geographical location, the terrain and the agro-climatic conditions. For example, North Indians consume cereals such as amaranths and wheat, while the people of the arid region of western India and semiarid tracts of Deccan live on sorghum and millets. Eastern India is home to rice and fish cultures, as are the states of southern and coastal regions of India.

The quality and quantity of food varieties depends on production from the farms, forests, rivers etc. in an area. If the climatic conditions are harsh, and extreme, the food availability is naturally affected.

Food & socio- economic conditions

In non-subsistence economies what is not available through local sources is obtained through “markets”. Access to both natural sources and markets determine food availability, and access to these is determined by economic and social status of individuals.

Community knowledge and practices regarding food

Over time, and across generations, communities have adapted to natural surroundings and learned to both preserve and process available food and increase availability of food (through cultivation). How well a community can sustain its food sources depends on its food culture – the knowledge and practices of accessing, preserving, and consuming food. The communities that have identified all its food needs and the food sources required to satisfy them, and also

have mechanisms to ensure that everybody gets what they need, can be considered the most progressive communities.

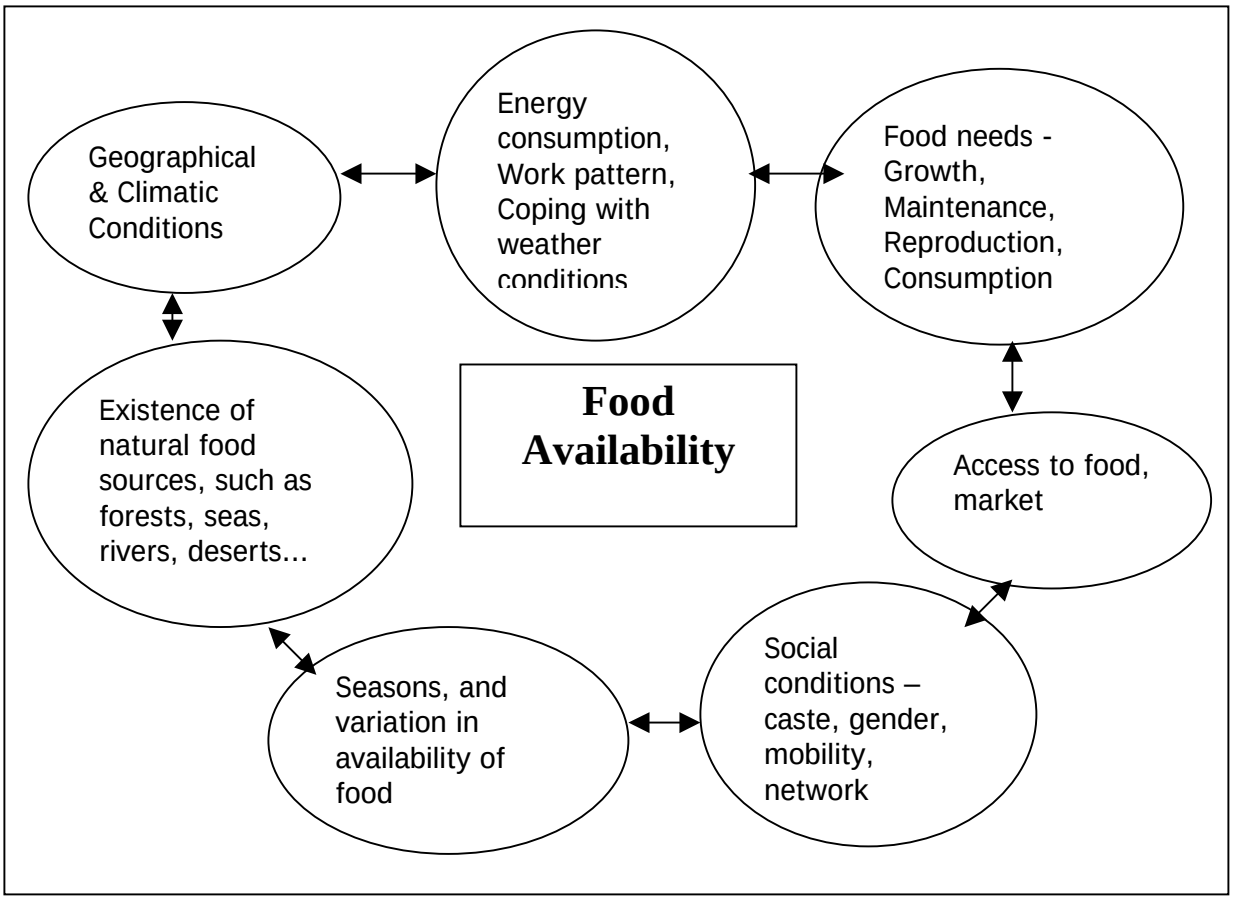


Chart No. 1. Factors affecting availability of food

The food needs are determined by nutrient requirements for different functions (growth, maintenance, reproduction etc.). During infancy, puberty, and pregnancy the food needs are more. Nutrient needs also depend on work, and living conditions. There is an interrelation in these factors and a correlation with social and economic conditions.

Food, nutrition, and health

The nutritive value of different foodstuffs varies, and the state of health of people depends a lot on the nutritive value of the foodstuffs consumed. Whether a person is healthy or not depends on how well nourished s/he is. Thus health also depends

on the amount and type of food available, and frequency of availability, with reference to requirement.

II. Food Knowledge and Practices in Tribal Communities

Tribal[1] communities reside in surroundings that are more natural. For fulfilling food needs, they directly depend on the natural environment. In fact most of the tribal communities were originally "hunter-gatherer" communities and had deep / intricate knowledge of their environment. Though today most of these communities cultivate the land, they still access forest and rivers as source of food. Thus, a variety of natural food sources are known to tribal communities (more than in agrarian communities).

Tribal communities everywhere are accustomed / known to eat a range of foods from the forest and water bodies. Tribal people prefer these varieties of food to the cultivated food. It is probably a result of availability of varying degrees of food material that influences preferences and food habits of these people.

III. Rationale of the study

In recent years, as the forest cover has depleted, the diversity of food available to the tribal communities has also decreased. Similarly increasing interaction with the non-tribal communities may have also influenced the dietary habits and the food that is consumed by the tribal communities. As per the opinions expressed by local women in focussed group discussions, these changes directly affect the health of a community.

Right from the time when the *Swayamsiddha* Project started dialogue with local communities on health issues, elder women in particular reported that a variety of foods available from forests, which were once consumed and believed to be nutritious, were rapidly vanishing because of various factors. This resulted in their view in an increase in the incidence of disease and malnutrition among their communities.

[1] Though there is no one a definition of tribal communities, conventionally the words tribal communities refer to indigenous communities, which are also outside the caste hierarchy. Tribal peoples reside in or near forests, in 'closed' communities with particular customs, language and a life style of their own.

In this context, a mapping exercise was carried out to understand the concerns of women about health. The women who participated in this exercise across all the locations identified “malnutrition”, as a major concern.

The project thus initiated several processes to help women understand and address “malnutrition”, as well as other problems identified by them.

Women identified a range of critical factors / reasons affecting their state of health which are as follows:

- Poverty, leading to unavailability of food
- Gender inequity in food distribution
- Deep-rooted food taboos,
- Unscientific local practices of food preparation
- Unsafe and insufficient drinking water
- Excessive workload of women
- Change in dietary practices due to decreasing local food sources
- Low food intake
- Multiple pregnancies

According to the women, environment deterioration is accompanied by the loss of traditional knowledge about food and food diversity. Women further tried to analyze the reasons for loss of traditional knowledge on food sources.

Reasons of reduced consumption levels of traditional foods were identified as follows:

- Change in cropping patterns and land use practices; this was believed to be one of the major reasons for the change in consumption practices and nutritional status and for the loss of traditional uncultivated foods.

- The loss of indigenous crops (variety) and traditional uncultivated food sources has affected the knowledge level of younger generations.

- Exposure to the new area and market facilities

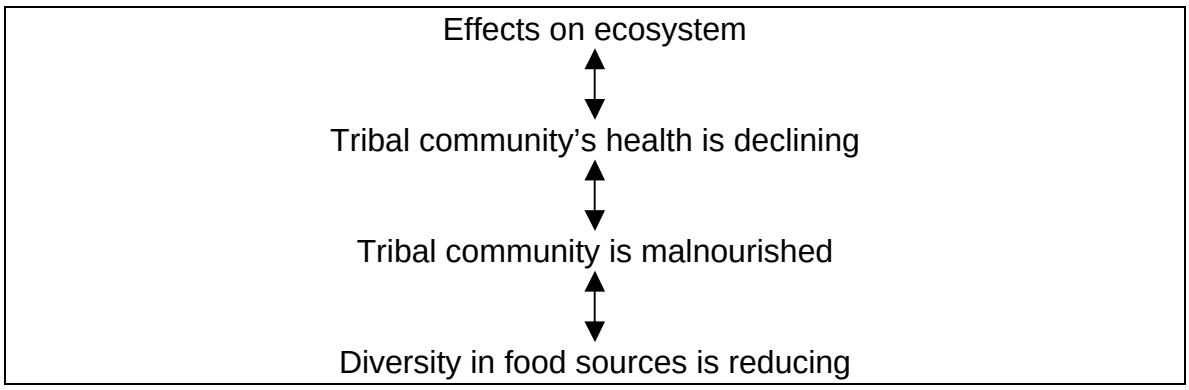
- New religious norms changed the nutritional status of tribal people in South Gujarat (through the introduction of fasts and other food habits).

- Formal education is also adversely affecting traditional knowledge.

While discussing the issue of food diversity and richness of indigenous food sources in terms of nutrition with the tribal community, it was realised that the younger generations in these tribal communities is less informed about traditional food sources and the preparation of traditional foods. Young people are often not

even aware of nutritive / medicinal values of many forest products that were at one time readily consumed.

This discussion can be summarised with the following diagram:



From the range of factors that are deteriorating their health, women in the DHRUVA project area decided to work on the issue of '**Food Diversity'**.

As per their suggestion, discussions were initiated to record the knowledge pool currently available about various food sources and practices, validate the nutritive value of the foodstuff, and document it for possible use in development programmes.

The women members of SHGs with whom the project is working directly took great interest in this study because they realized the gravity of the malnutrition problem after the BMI data was collected with their help. The following excerpts from the discussions during the initial mapping exercise illustrate their concern:

"*In recent times our food habits have changed. Because what we get to eat has changed. Previously we were cultivating Nagli [Finger millet] as a main food but now it is mostly paddy*".

"*Young people can not identify which tubers, mushrooms are edible, or which ones are non-edible*"

"The seasons are changing. We are facing extreme summers and long dry spells. The availability of seasonal food has also become unreliable."

Considering the above situation, women understood the paramount significance of documenting the indigenous food sources and recipes. Hence it was felt essential to chronicle the same.

Main Objective of the study

To document the knowledge of local tribal communities, especially of women, about indigenous food sources [seasonal availability, popular recipes, and nutritional / medicinal properties of these food sources] and promote improved nutritional health practices based on this knowledge.

Specific Objectives of the study:

- **To document the seasonal availability of food sources of tribes [what variety of food do they eat over the year]**
- **To study the main ingredients of their traditional diet and what are the different sources of these ingredients (forest, farm, river etc.)**
- **To document the popular recipes and find out nutritional / medicinal values of these recipes**

CHAPTER 3 - RESEARCH METHODOLOGY

Ecohealth Research

Good health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity. Health is the extent to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs; and, on the other hand, to change or cope with the environment. It is not an objective for living, but a resource for everyday life. Health includes the notions of the balance or harmony, as well as the capacity to respond and adapt to changing constraints and opportunities[2].

In terms of health research, the Ecosystem approach to human health (or the Eco-health approach in short) provides a valuable framework within which to explore the complex nature of development issues and their links to human health within a defined ecosystem. This anthropocentric approach recognizes that a multiplicity of factors originating from the socio-economic, political, biomedical and biophysical environments are linked and requires that these factors be studied *together* to get a truer sense of the dynamic world in which we live. Research that attempts to tease out these links within a defined ecosystem can thus provide more robust policy guidance for the improvement of human health and well-being[3].

The ecosystem approach to understand human health (Ecohealth) is developing as a new paradigm in development research. The Swayamsiddha Project was introduced to this approach by IDRC. One of the purposes of integrating research into this project was capacity building of implementing organizations in (understanding and applying) the Ecohealth approach. It attracted the attention of the project because of its salient features / guiding principles listed below.

- Participatory research process
- Interdisciplinary research team and transdisciplinary research process
- Gender responsiveness

These guiding principles were applied in this study as well. These principles stipulate the need for some tools and techniques that engage various sections of society in the study process and explore the dynamism of interrelating factors from environmental as well as social systems. Those used in the study included:

- Systems Mapping as a tool for understanding interrelations between social and ecological determinants of health in the various subsystems,

2 Kay and Waltner-Toews 1999

3 Lebel 2003

- Gender analysis for understanding how and why women and men are affected differently and what inclusive actions can be envisaged
- Focus Group Discussions for facilitating perceptions and information of key stakeholders

Some specific tools were developed and some standard tools were used in addition to these methods. The local community, and the Self Help Group (SHG) women in particular, were involved in the entire process of data collection as the main stakeholders. A Research Associate (RA) facilitated the study working closely with the DHRUVA cluster team, communities, BAIF central coordination team and RAs of other partner teams of Swayamsiddha.

A long drawn planned process of capacity building followed along side the research. The Research Associates would assemble for a workshop; discuss process of research step-by-step and then return to field for applying what they learnt. This process is described separately in another document.

Research Process

I. Baseline study

A base line study of the project area was carried out in the initial stages of the Swayamsiddha project in 2001. During this study, people pointed out several issues that were major areas of concern for them. Some of the most prominent issues identified were as follows:

- Food insecurity and malnutrition
- Threatened livelihoods and forced migration
- Degrading natural resources and unviable agriculture
- Water and fuel scarcity and work pressure on women
- Unequal distribution of the work between men and women
- Blind faith, ignorance and poor health
- Lack of access to health services
- Excessive labor and insufficient food intake
- Addictions to various substances
- Illiteracy, low self-esteem and lack of awareness about development opportunities

II. Involving People

One of the components of the *Swayamsiddha* Project was to carry out a participatory research study on a common concern identified by all the project partners working in different locations. Given the context and goal of the *Swayamsiddha* project, the participation of the community was considered a ‘must’ for all the activities, including the research study. Involving people in the research process, right from selection of the research subject is one of the peculiar features of the Ecohealth approach that was used.

III. Selection of Theme

As noted earlier, community needs assessment exercise was carried out during the inception phase of the Swayamsiddha project, during which communities expressed their concerns related to health and the degradation of the environment.

In order to probe further, a mapping exercise was carried out with community members and other key stakeholders working with DHRUVA to understand the concerns of women about their health. The women who participated in this exercise across all the locations identified “malnutrition”, as a major concern.

Mapping was used as a tool for understanding the factors responsible for health problems, as perceived by different stakeholders like Traditional Health Practitioners (THP), Traditional Birth Attendants (TBAs), Village Health Guides (VHGs), Agricultural Technical Group (ATG) staff members of DHRUVA, in addition to tribal men and women.

Mapping

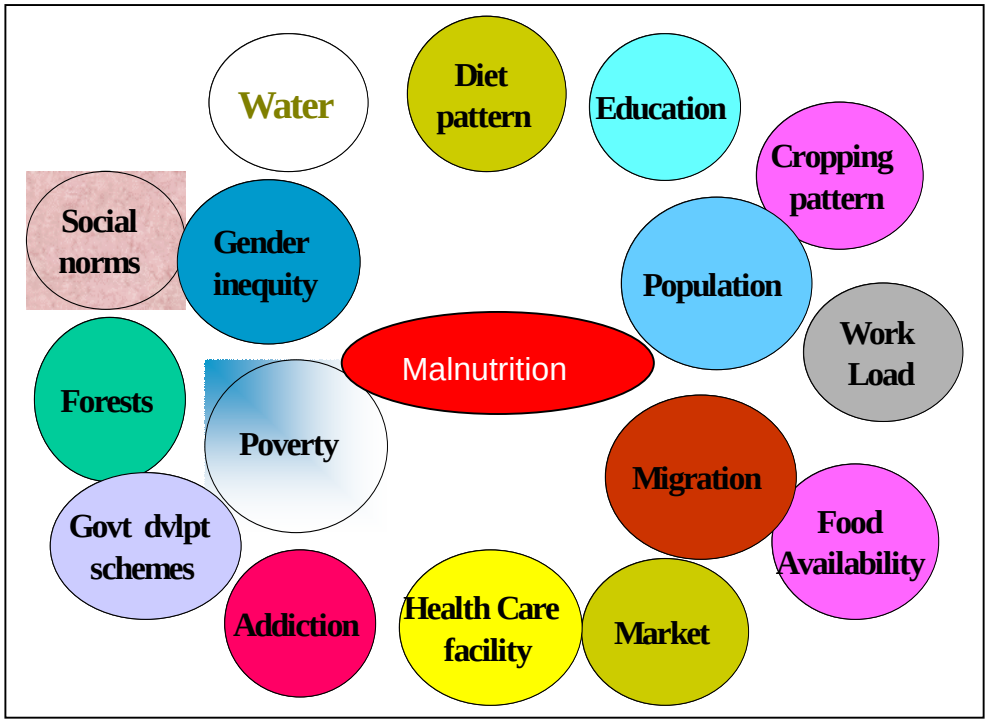
The mapping exercise was planned to help understand how the local community perceives the “malnutrition” issue, and what do they relate it to. The Central Project coordination team of the Swayamsiddha Project (CPCT) and the Project implementing team (PCT) discussed who should be involved in this exercise so that perspectives of all the relevant stakeholders were included in the planning process. The mapping was seen as the basis of the study design. The location, timing and preparations were made to suit the involvement of the primary stakeholders.

The mapping exercise was conducted in an informal and non-threatening environment, avoiding a not uncommon situation where high numbers of external persons inhibit the participants. The exercise was treated more like a PRA session. Facilitated by a CPCT member, the whole process took one full day. It resulted in the identification and discussion of problems as perceived by local men and women related to health in their area. A large number of critical factors affecting women’s and their children’s nutritional status were mentioned by the participants to explain the high prevalence of malnutrition or ill health in the population. These included:

- Workload of women
- Reproductive health problems
- Unavailability of safe and sufficient drinking water
- Poverty
- Seasonal migration
- Gender inequality in food distribution
- Food availability
- Cropping pattern
- Deep-rooted food taboos
- Unscientific local customs

- Change in dietary practices due to declining local food sources
- Low food intake during multiple pregnancies

Participants with health and malnutrition in the area associated the elements presented in the figure below.



The project initiated several processes to help women understand and address "malnutrition" as well as other problems identified by them.

Based on these discussions on health concerns, the women members of SHGs in the DHRUVA project location short-listed the following key issues for further study:

- **Gender differences in malnutrition**
- **Food availability and access**
- **Change in cropping pattern**
- **Migration**
- **Socio-religious practices**

Finally, participants felt that the dwindling availability of indigenous and nutritionally rich food sources was a main reason affecting the presence of malnutrition. Participants also realized that they are using a lot of unconventional

varieties of local foodstuffs and that there is a decline in the knowledge about this in the younger generations. Hence it was decided to conserve and restore the knowledge for future generations about indigenous food sources by documenting the various food sources, their seasonal availability, popular recipes, and nutritional / medicinal properties.

The study is based on the assumption that the “nutritive value of locally available food is an important factor affecting the nutritional status of the population in a region.”

Procedure for defining specific objectives

After defining the purpose of this research, it was thought necessary to further discuss with the community the specifics of the problem and how to go about doing research on it. The community members [read women] expressed their will to share the information on what kind of different food sources are available in the surrounding area.

In this way, the first objective of the research study was decided, that is documenting the local food resources of participating communities.

Further discussions also revealed important indigenous knowledge about the plethora of local nutritious cuisines / dishes, their availability, taboo associated with these, methods of preparation, etc. This prompted us to take up this aspect as the second objective of the study.

When discussions were conducted on the nutritional / medicinal importance of available food sources, people were very eager to share and learn about the nutritive value of the food consumed by them and it thus formed the third objective of this study.

It was also decided to undertake anthropometric measurements and determine the BMI of a sample number of women to understand the nutritional status of the women in the area.

Selection of villages

Two villages were selected for the study, namely Khambla and Chikatiya from the *Swayamsiddha* project area. Khambla is a village near a forest and Chikatiya is situated close to the state highway and is easily approachable by road. Other criteria used in selecting these two villages are as follows:

- Willingness of community [VHG and SHG members] to participate in the study
- Rapport developed with the community members [particularly women]

- Variety in availability of food sources and habits

Research Questions

Research questions for each objective were developed and were then further classified by sources from which the information would be required to find answers to these questions. The variables for which data would be required were also identified. The tools to collect the information needed were designed later with the help of the BAIF team and technical experts. In developing the information summarized in the table below, the following questions were used as a guide: What information is needed to answer the research questions? Is it possible for us to collect it? How, When and Who? What are the possible sources and methods for collecting it? How to ensure authentic and adequate data?

Table 1: Research Questions

Objectives	Research Questions	Variables	Tools
To document the seasonal availability of foods.	▪ What is available? ▪ When is it available? ▪ Where is it available?	Seasonal Food availability.	FGDs Consultations with experts in the identification of foods and their properties
To document availability of seasonal food from different sources.	▪ Where is it available? ▪ What are different sources of availability food? ▪ Who is responsible for food in the family?	Food availability From different sources.	FGDs Consultations with experts in the identification of foods and their properties
To study the main foods and ingredients in people's traditional diets.	▪ What type of foods they preferred before? ▪ What type of changes can be observed in food availability?	Change in food availability and food habits.	FGDs, Interviews, Consultations with experts in the identification of foods and their properties
To document popular recipes.	▪ What type of foods you prefer and how to cook them? ▪ What types of ingredients are required for cooking? ▪ What types of the popular recipes are in your area? ▪ Is there any traditional norm or taboo related to the food?	Recipes, Ingredients, Methods of cooking.	Personal Interviews, Food Festival, Consultations with experts in the identification of foods and their properties
To find out the nutritional as well as	▪ Are their any medicinal properties of foods that you	Recipes, perceived nutritional &	Personal Interviews, Experts

Objectives	Research Questions	Variables	Tools
medicinal properties of forest foods and recipes.	take? ▪ When you are ill what different foods you take?	medicinal properties, cultural elements of foods	interviews, Food Festival

Methods and Process of data collection

Information from tribal people [women in particular] was collected by means of various techniques such as:

- Focus Group Discussions,
- Interviews with key informants [such as *bhagat*, VHG, *dai* etc.]
- Interviews with scientific experts, and
- Organizing Food Festivals

Focus Group Discussions (FGD)

FGD was the main tool used in the process of data collection. We decided to use this technique as our main tool for data collection in order to enable us to collect data from individuals as well as to cross validate the data, and to enrich the information base. In all, eight FGDs were held with the community members of Chikatiya and Khambla.

The first FGD was planned and held with the village health guides from eight villages for pre-testing purposes. After this first FGD, we decided our FGD should be focused on one issue at a time, rather than holding discussions on successive subjects in one single meeting. In the FGDs, different tools like charts, audio recording, pictures, and photographs were used to encourage the discussions and facilitate the collection of information.

FGDs at times led to some hot arguments and brought bitterness between participants due to comments made on each other's food habits [based on sub-casts among tribals] by different communities. We therefore decided to collect some data through personnel interviews when the potential for conflict was

considered high. The FGDs were also organized to include participants of similar age groups to better assess their knowledge of the local foods and related information.

The FGD with old age groups was very much focused on change in food diversity. Questions were related to food ingredients, which they had seen in their childhood and the current status of these food items (available, partially available or not available now in the area).

Table 2: Schedule of FGDs and corresponding topics of discussion

No.	Village	Date	Participants	Topic
1	DHRUVA office, Lachakadi	25 Aug 03	VHGs from 8 villages	Introduction of eco-health research and sharing concept of research
2	Same	25 Jan 04	VHGs	Perception of VHGs about ill-health / malnutrition
3	Khambla	20 Sept 03	SHG Women	Food habits of people [free listing]
4	Same	4 Sept 03	SHG Women	Availability of food sources in different seasons and food recipes
5	Same	25 Oct 03	SHG Women	Perception of women from different age groups on availability of food in the area
6	Chikatiya	23 Sept 03	SHG Women	Food habits of people [free listing]
7	Same	27 Oct 03	SHG Women	Availability of food sources in different seasons and food recipes
8	Same	5 Nov 03	SHG Women	Perception of women in different age groups on availability of food in the area

Food Festivals

Recipes prepared by women in Khambla for the food festival

The food festivals were arranged to verify the data collected through FGDs, especially on how local food knowledge was being used in daily life. The food festivals provided an opportunity to collect a large number of recipes for different local foods. This also exposed the younger generations to the knowledge about recognizing and using the local variety of different dishes besides boosting the confidence of the participants for community events.

Some recipes known by only the older people were available to others to taste. Variations in the recipes from different villages also enabled the participants to learn from each other.

Personal interviews

The need of personal interviews came up for reasons described earlier. This method also enabled the usually reticent women in FGDs to share their views. Interview schedules were designed purposely for those women of different castes and communities. Forty interviews were carried out with women of different castes and age groups to assess their knowledge regarding the kind of food available from different sources. The respondents were from different castes and communities.

Expert interviews

During the focus group discussions, the use of these food items by the fraternity of local *bhagat* was frequently mentioned.

The reason for this was mentioned as the frequent visits made by these *bhagat* to the forests for collection of medicinal herbs, which made them more acquainted with those items having medicinal properties that are used as food.

Therefore, it was decided to carry out an informal discussion with *bhagats* (THPs) and *dais* [TBAs]. These *bhagats* and *dais* enjoy a special position in the tribal communities. They are the key persons as far as the use of herbs (food ingredients with medicinal properties) is concerned.

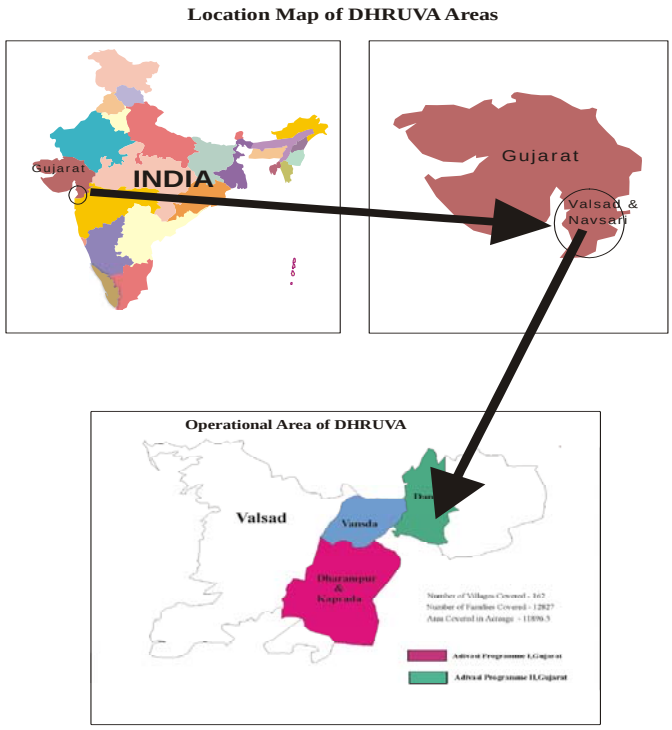
To find out the scientific names and nutritive values of the different food items, information on them from secondary sources was tapped. This however proved to be not so simple due to the local names of foods used by the community and the

need to find their associated botanical names, which are generally used by the secondary sources. Dr. Minu Parbiya (Botanist in South Gujarat University) helped the research associate in the identification of these names.

CHAPTER 4 - GEOGRAPHICAL & SOCIAL CONTEXT OF THE STUDY AREA

Geographical information

Gujarat is one of the prosperous states in India, situated on the western India coast. The state has a population of 50 million[4], consisting of 4.88 percent of India's Population. The population density is 210 persons per sq. km. The State has 25 administrative districts divided in to 222 blocks with 18,569 villages. Tribal people comprise 14.8% of the total population of the State. These tribes reside mainly in the south of Gujarat, mostly in Dangs, Valsad and Navsari districts. These districts witness a seasonal migration of substantial magnitude due to poverty and backwardness[5].



Vansda is a taluka (block) situated in Navsari district. Vansda was a princely Kingdom before independence. The main rivers are the Kaveri and Kharera. Yajmangadh, Torania and Pilwo are the main hills. The eastern side is mountainous with an average rainfall of 200cm. The land is rocky with very little topsoil.

[4] Primary Census Abstract: Census of India 2001 census, 1991

[5] Mukkavilli Seetharam, (Gender Profile Gujrat Royal Netherlands Embassy New Delhi

The main crops are rice and Nagali. In earlier times another small millet was grown but it is not cultivated any more. Vansda taluka has 94 villages. The different tribal communities in the region are Bhil, Halpati, Dhodias, Chaudharis, Dhanka, Kukanas, Varlis, Rathwa, Gamit, Patelias, Kotwalias, Nayaka, Kalgas, and Kathodia. Although Adivasis (tribal people) are in general worse off economically than non-tribal people, there is a wide variation in the social and economical status of the various tribal groups.

Landholder tribal communities like Dhodia, Nayaka and Kukana are economically better, and are more educated than the landless Kolchas, Kotwalias and Varlis who are very poor and work as farm labourers or artisans (bamboo craft) and live more or less in isolated existence. Kotwalias are given a lower status even among the various tribes.

Social Information on tribal communities

The area is predominantly tribal. The following sections highlight key characteristics of the main tribes in the study Area.

Kukana

Kukanas are located mostly in Vansda, Dharampur, and Dang's area. Their typical houses are made mostly of wood and have tiled roofs. The houses are usually poorly lit and unventilated. Cattle are kept in a part of the same house. Grain is stored in bamboo baskets, pasted with cow dung. A cluster of houses (hamlet) is called a "Faliya". It consists of 5 to 10 houses. Usually these are nuclear families. Soon after marriage, the couple begins to live in separate quarters in the vicinity of the parent's house.

The main occupation is agriculture and landholding varies from 2-8 acres. Religion has a very important place in the life of tribals. In spite of the impact of Hinduism, tribal communities go on worshipping their traditional gods and goddesses and also celebrate their traditional festivals in their own way.

Kotwalias

Kotwalias are today dispersed in small groups in villages of south Gujarat. They are semi–nomadic in their habits even today. They usually live in the vicinity of the forests. Their main occupation is bamboo craft, wage labour, and collection of forest produce (bamboo, tubers, gum, seeds etc). The economy of Kotwalias depends on the sale of bamboo and its products like mats, baskets etc. Their economic condition is very bad. They are treated as untouchables and do not have much communication with other tribes. They live in isolation in the last faliya of the village. The level of literacy among them is very low. Kotwalias exchange their products for food, or they sell them in the market to fulfil their needs

Kolcha

Kolcha is a community like the kotwalias. They also live in isolation, in between the Kukana and Kotawalias in a village. Their economy is dependent on making agricultural implements and agricultural work. They also collect non-timber forest products. They live in the village as long as employment is available, but migrate from village to cities as construction labourers.

Other communities:

The other communities in the project area are converted Parsi, Panchal, and Christians. They are economically better than others. Their land holdings are also more than for the other communities. Their population is relatively less as compared to other tribal peoples.

The social and ecological context of the two study villages

Chikatiya

Location

Chikatiya is a village located at about 8 km from the DHRUVA campus in Lachakadi. The village is about 1.5 km from the State highway. It has six faliyas (hamlets).

Population and caste composition

The total population of the village is 1,252 with 600 women and 652 men. The village resides at the banks of the river Kaveri. The casts include Kukana, Kotwaliya, Kolcha, Dhodia patel, and Nyaka patel. In Chikatiya, 80 % of the people adopted different religions from different religious sects and became vegetarian.

Physical amenities

Vansda and Limzar are the nearest market places, and Fridays and Sundays are the weekly market days respectively. Many women from Chikatiya go to the market to sell vegetables. For daily needs, there are two shops on the state highway (about 1.5 km away from the village).

Transport facilities are available from the highway.

Health facilities are not available in the village but DHRUVA has trained one woman per village in the project area as a Village Health Guide. These VHGs provide primary health care in the villages.

A primary health care centre run by the government is situated at Godamal, about ten km away from Chikatiya. Curative health care services by a cottage hospital, as well as private medical practitioners, are available at a distance of about 5 km at Vansda. In addition, a mobile hospital run by a private trust visits the village every week. Despite these services, Chiktiya is largely dependent upon the health care services provided by traditional health practitioners.

Education facilities are available in the village up to seventh standard.

Social groups

Seven SHGs (65 women) joined the *Swayamsiddha* project activities. One VHG is engaged in different activities related to empowerment of women. The non-members of SHGs also participate in some of the project activities.

Agricultural practices

The main crop of the village is paddy. Cash crops are sugar cane, wheat, and lal kand, while mango and sapota are the main horticultural crops. Vegetable cultivation is the main income generation activity for women in the village. This is mainly undertaken under the 'wavli' system.

Wavali The wavali tradition is practiced among the Kukana and warli tribes. This unique tradition in South Gujarat tribal area gives exclusive rights to women on their earnings. Traditionally mothers-in-law give a piece of land (usually near a common water source) to daughters-in-law for cultivation under the wavali system. Period for wavali cultivation is November to March. Along with vegetable cultivation, animal rearing is also an important income generation activity due to presence of a village level dairy cooperative.

Improved agricultural practices have not been adopted in this area and traditional cropping systems prevail.

The women in Chikatiya cultivate many vegetables but these are mainly for sale in the market rather than for self-consumption. The commonly consumed vegetables in the area are potato and brinjal. It was observed that these were consumed at least five times in a week.

Khambla

Location

Khambla is the last village in the project area and Vansda block. It is also nearer to Dang's forest area.

Population and caste composition

The total population of the village is 3,198 with 1,548 women and 1650 men. The village has eight (faliya) hamlets with 545 households, of which 160 families fall below the poverty line. The Kaveri river flows through the village, dividing it in two almost equal parts. The casts in this village include Kukana,Kotwaliya, Kolcha, Dhodia patel, and Nyaka patel.

Physical amenities

Market facilities are available in the village with every Tuesday being a market day. For daily needs, Vansda and Waghai are the nearest towns. Waghai is 6 km away from Khambla and Vansda is about 10 Km away.

Transport facilities are frequent from the roadside but vary according to the location of faliyas. During the rainy season, Moha faliya is cut off from the village and communication becomes difficult.

The village comes under the Mohwachh Primary Health Center, 4 km away from the village by kachha road. There is no private doctor in the village. A DHRUVA trained village health guide provides primary care to the villagers. DHRUVA has also trained one *dai* (TBA) for village level work.

Primary level education facilities are available in the village up to seventh standard. There is one Aaganwadi in the village where children get one meal (rice and horse gram) per day.

For high school, students have to walk 5 to 10 Km daily to Vansda, Waghai, or Amba-bari.

Migration is more in the case of Khambla as compared to Chikatiya. The household economy depends on wage labour work. Village level opportunities for employment are low due to a small proportion of landholding families in the village.

Agricultural practices

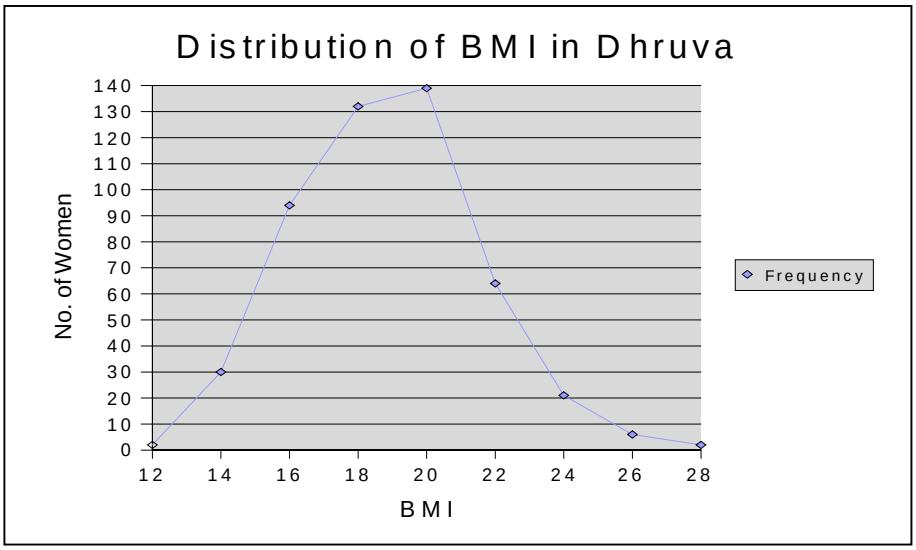
Cropping pattern of the village includes paddy as the main crop for selling, but along with paddy they also grow minor millets like Nagali and Varai for household consumption. Very few of them also started cultivating sugar cane. Horticulture orchards are no more in the village. Scarcity of water is the main problem faced by villagers along with unemployment. Khambla people are more dependants on the forest and river for food items.

CHAPTER 5 - RESULTS & DISCUSSION

This study attempted to understand the level of malnutrition in 2 villages of the region. Data indicating poor nutritional status of the women in the local community and information related to the availability of forest food and changes in the diet pattern are presented in the following pages.

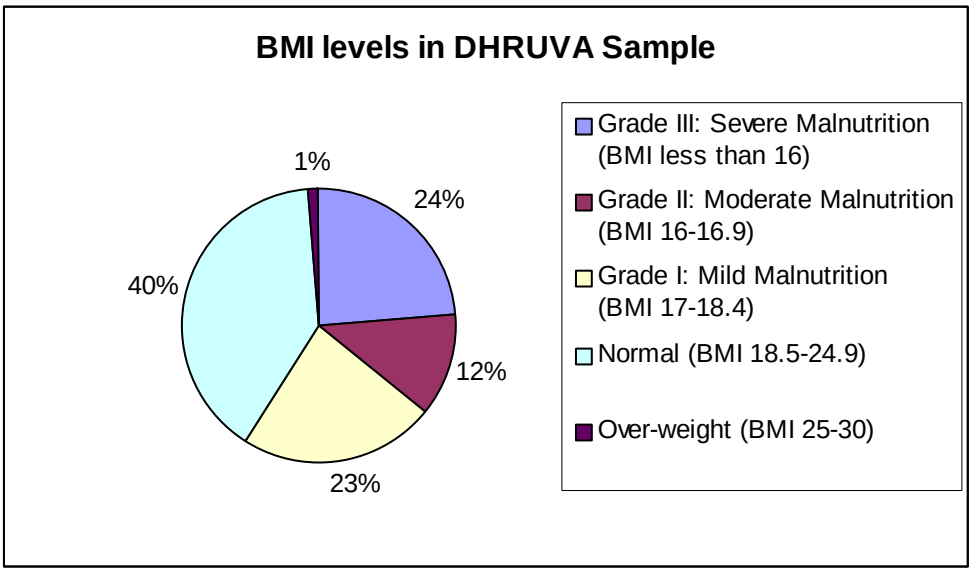
I. Poor Nutritional Status of the Women

Anthropometric measurements were collected for a total of 232 women (SHG members) of the region participating in the DHRUVA Swayamsiddha project and their BMI was estimated. The data confirmed the hypothesis that severe malnutrition exists among a significant number of the SHG women in the study area.



The BMI distribution was normal around the mean as shown in the graph below., The classification of malnutrition levels for a study sub-sample of 90 FGD women from the particular study communities is given in the chart below (See AP Kulkarni, 2005 for discussion on malnutrition levels)[6]. When discussed with the SHG women, inadequate and improper foods as well as high workload were ascribed by them as the main reasons for malnutrition.

[6] AP Kulkarni (2005). Ecohealth Research. BMI and Chronic Energy Deficiency in Selected Villages of the Swayamsiddha Project. BAIF Development Research Foundation. Pune, Maharashtra, India.



In the sub-sample of study villages above, 59% of women can be considered as having some level of malnutrition, with almost a quarter of them being in the severe malnutrition Grade III category.

Proximity to forests did not reflect a better nutritional status

It was assumed that the communities situated inside the forests would access more forest foods and this would reflect in a better nutritional status. Accordingly, BMI ratios of malnourished women in Chiktiya (relatively away from the forest) tend to be more than in Khambhla (closer to the forest), but the difference is not statistically significant given the low numbers of people in each category.

Table 3: Nutritional Status of SHG women in the Sample Villages (as per BMI)

Nutritional Status	Severe Malnutrition Grade III	Moderate Malnutrition Grade II	Mild Malnutrition Grade I	Normal
BMI →	**< 16**	**16 to 17**	**17 to 18.5**	**> 18.5**
Chiktiya	26.0 %	9.6 %	28.8 %	35.6 %
Khambhla	30.2 %	4.7 % %	16.3 %	48.8 %
Total	27.6 %	7.8	24.1 %	40.5 %

Chi^2: .7

While listing the food sources and preparations (recipes), it was found that women in Khambla, living closer to the forest, did possess more information and knowledge of traditional food sources and their processing. But this greater knowledge does not seem to translate into use. In practice, Khambla women did not necessarily consume more forest foods than the women in Chiktiya. They also pointed out to factors affecting their food habits.

a. The forest cover is receding due to contractors given permits for chopping trees. Biodiversity is declining as the forest department promotes monoculture, by planting only timber species (teak and eucalyptus being the most common). Even the government nurseries do not have locally valued indigenous species.

b. The local communities seek work for wages in near by towns as the forest-based livelihoods are declining. Repeated mention was made of labour contractors taking away trucks full of local boys and girls to nearby towns to work on roads and building construction. This was a clear indication of how a substantial portion of the local population now spends more time away from their surroundings.

   This results in: (i) lesser time for accessing forest food sources; (ii) lack of orientation of younger generations to the diversity of forest foods as they remain physically away most of the day, and often a number of days at a time; (iii) availability of cash in exchange of labour leads to increased choices in the purchase of foods from stores and markets; (iv) consumption of tea, farsan, khaman and phafda increases with daily migration, and such products start making in-roads in the villages. Thus those who do not leave the village for work also relish such foods whenever they have cash in hand.

c. With the market economy, the "social value" of a product goes up when its monitory value is higher. Inclination towards forest foods thus declines, as it is not "priced". The "value" of "time" increases when one works for wages, and to spend it (time) for searching tubers and plucking flowers from the forest is seen as less "productive".

Social and economic status do not necessarily lead to a better nutritional status

Food norms vary between communities, as traditional occupations lead to different opportunities. The agrarian tribes were expected to show a different food pattern than those dependent on forest based livelihoods. However, as the SHGs were comprised predominantly of Kukanas, we could not fully verify this possibility. The others comprised only 14% of the SHG membership.[7] The Kukana is an agrarian

[7] As is observed elsewhere, the better-off communities are the ones that participate more actively in SHGs as opposed to those struggling to survive.

community, most people own land, and have a level of literacy and education higher than in other study communities. Kolchas (landless labourers), Kotwadia (basket makers), Dhodia patel and naika patel are clubbed together as others, as their number was very low.

Table 4: Distribution of BMI across the tribal study communities

Nutritional Status	Severe Malnutrition Grade III	Moderate Malnutrition Grade II	Mild Malnutrition Grade I	Normal
BMI →	**< 16**	**16 to 17**	**17 to 18.5**	**> 18.5**
Kukana	32%	9%	21%	38%
Other			43.75%	56.25%
Total	27.6%	7.8%	24.1%	40.5%

There was no statistically significant difference in BMI of women belonging to different tribes of the project area. However the trend observed is that the levels of malnutrition (including the more severe ones) appear to be higher among the Kukana.

The roles and responsibilities in the family and community vary by age, and it is often reported in the literature that as age progresses, nutritional status improves. However, in the study area this differentiation was not observed.

Table: 5 Nutritional status of women of different age groups (as per BMI)

Nutritional Status	Severe Malnutrition Grade III	Moderate Malnutrition Grade II	Mild Malnutrition Grade I	Normal
BMI →	**< 16**	**16 to 17**	**17 to 18.5**	**> 18.5**
Age group	**Less than 16**	**16-17**	**17-18.5**	**More Than 18.5**
<30 years	22	3	19	31
%	***28.95***	***3.95***	***25.00***	***40.79***
30-40 years	4	3	9	10
%	***15.38***	***11.54***	***34.62***	***38.46***
40< years	6	2		6
%	***42.86***	***14.29***	***0.00***	***42.86***
Total	32	9	28	47
%	***27.59***	***7.76***	***24.14***	***40.52***

Chi^2: 0.43

There was no statistically significant difference in BMI of women of different age groups.

Educations leads to more informed behavioural practices, however literacy does not appear to reflect in significant differences in nutritional status.

Table 6: Distribution of BMI across different education levels

Tribe	Less than 16	16—17	17--18.5	More than 18.5	Total
Illiterate	24	8	20	25	77
%	***31.2***	***10.4***	***26.0***	***32.5***	***100***
Literate	8	1	8	22	39
%	***20.5***	***2.6***	***20.5***	***56.4***	***100***
Total	32	9	28	47	116
%	***27.6***	***7.8***	***24.1***	***40.5***	***100***
Chi^2:0. 31					

There was no statistically significant difference in BMI between literate and illiterate women, however the latter tended to have higher rates of malnutrition for all categories.

Table 7: Distribution of BMI by Land Holding

Tribe	Less than 16	16—17	17—18.5	More than 18.5	Total
Landless	11	1	6	6	24
%	**45.8**	**4.2**	**25.0**	**25.0**	**100**
1 to 2 acres	11	1	12	25	49
%	***22.4***	***2.0***	***24.5***	***51.0***	***100***
More than 2 acres	10	7	10	16	43
%	**23.3**	**16.3**	**23.3**	**37.2**	**100**
Total	32	9	28	47	116
%	**27.6**	**7.8**	**24.1**	**40.5**	**100**
Chi^2: 0. 25					

The table illustrates that no significant relationship between land holding and BMI of the women was observed.

Availability of food, changed food habits changes in cropping patterns, religious and social changes affect the nutrition of a community. Access and knowledge of traditional cultivated and uncultivated foods also contribute to the nutritional status of the tribal people. The mapping exercise, FGDs and interviews carried out indicated that the diversity of food available in the study area is very vast. This is summarized in the next table.

Table 8: Availability of food per season in tribal areas of south Gujarat.

Types of food	Summer	Rainy	Winter
Cereals	Bamboo seeds, Ragi,	Kodu Light Rice	Bajara, Nagli, Maize Jowar, Wheat, Panivaragu, Minor millet –Rice
Pulses, Legumes	Horse gram, Peas (All Papadi) Seeds, Moth beans, Groundnuts	Green gram, Kantalo, Math, Ambat chukka, Vasasni, Chanana	Bengal gram (whole), Black gram dhal, Cow pea, Field bean, Horse gram, Peas, Rajamh, Red gram, Soya bean, Groundnuts
Oilseeds	Mahuwa seeds, Groundnut seeds		Kharsani Seeds
Leafy vegetables	Dhana, Mitha Limbdo, Saragavo,	Taravardini vel, Ajola, Tera, Dugar jira, Ajamana pan, Kuradu, Zarzira, Lot,Kumadi, Ambadi.	Dhana, Mitha Limbdo, Saragavo, Methi
Tubers, Roots	Raj Alu, Buja Alu. Bahcha Alu, Alu, Amba haldar, Dugari, Suran, Kand, Kadu Kand, Dangar, Samal Musali, Safed Musali, Halenda	Tender leaves of Alu Jagali Suran	Raj Alu, Buja Alu, Bahcha Alu, Alu, Amba haldar, Dugari, Suran, Kand, Kadu Kand, Dangar, Samal Musali, Safed Musali, Halenda
Fruits, Flowers	Mhuwa flower, Augest flower, Kakada, Adwa, Kravanda, Mango Jamaruk, Jambu, Kamark, Bhorkar, Jack fruit, Ramphal	Chiku, Fanas, Ber, Papaya, Nibu, Santara, Ramphal	Sitaphal
Mushroom		Bopid, Jagali, Adib	
Fish, other aquatic foods		Kekhda, Machali of different types	
Birds			Tetar , Haran, Badak, eggs of chicken, duck and other birds

Foodstuffs may be broadly classified as cereals, pulses, oilseeds vegetables, fruit, flowers, and others. These foods contain nutrients, which perform various functions in the body. The nutrients include protein, fats, carbohydrates, vitamins, and minerals. They are all present in a variety of foods. The different classes of foodstuffs supply our daily requirements.

Cereals

Rice, wheat and all millets (jowar, bajra, ragi etc) are the main grains consumed in India. They are the cheapest source of calories and they comprise 70 to 80% of calorie intake in the diets of the majority of the population. Most of the cereal grains contain 6 to 12 percent proteins, and in general cereal protein is somewhat deficient in the essential amino acid lysine. Rice protein is richer in lysine compared to other cereals protein, but rice is an especially poor source of two important minerals, calcium, and iron.

Nagali is very rich in calcium and iron. Bajara is a very good source of iron as well. Whole cereals are important sources of 'B' vitamins, especially thiamine.

Pulses:

Pulses are rich in protein. However, the pluses' protein is rich in lysine and adds therefore a good supplementary value to a cereal diet. The lysine deficit in cereals is compensated by the lysine present in pulses, and thus the overall nutritional value of a cereal-pulse diet is better.

Oilseeds:

Like pulses, oilseed are rich in protein, in addition these also contain fats making them rich in calories. Oilseeds are used in the extraction of edible oil. The oil cake is much richer in protein content. Oilseeds are also rich sources of 'B' complex vitamins.

Green leafy vegetables

Green leafy vegetables are rich sources of calcium, iron, carotene, vitamin 'C', riboflavin and folic acid. These vegetables are, therefore, inexpensive sources of many nutrients, which are essential for growth, and maintenance of normal health.

Roots /Tubers:

Foodstuffs belonging to the group of roots and tubers are rich in carbohydrates and hence they yield mainly energy. They can also be rich in carotene. The shelf life of tubers is more then 8 months.

Other vegetables

Other vegetables not in the category of leafy vegetables and roots are fair sources of vitamins and minerals. Most of them are also consumed to add variety to the diet.

Fruits

Fruits are generally good sources of vitamin ‘C’. Yellow fruits also contain carotene and dried fruits are good source of iron. The fruits are included in the diet in adequate amounts.

The previous table shows the availability of food in the study area. It also clearly indicates the large variety of foodstuffs and different forest products, which are used as food by communities. The FGDs revealed that due to land forest degradation, the availability of many of these foods is being affected.

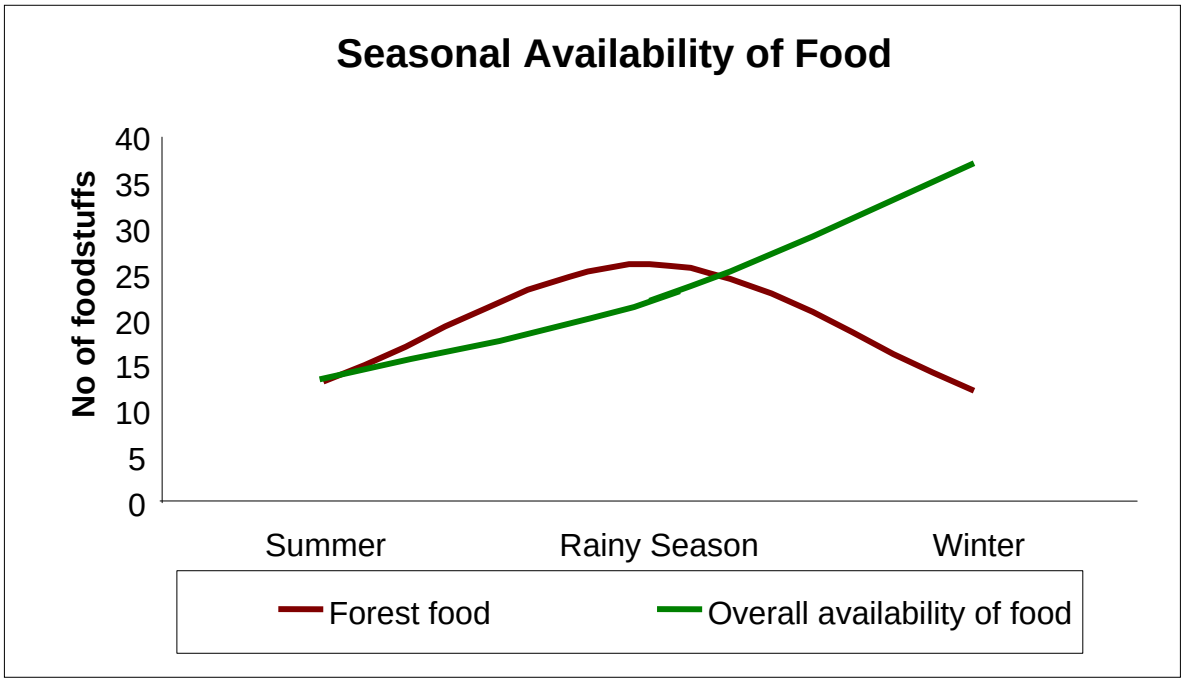
It was also observed that the food availability varies from season to season. The monsoon brings mushrooms and a variety of fish species and vegetables. However, during the monsoon season, the availability of food at the household level is less while the workload is more. People said that they find it difficult to spare the time to go to the forest for collecting food. It was further noted that collection of available food was very challenging during monsoon due to the difficult terrain.

Winter is a good season, as there is greater availability of food after the rains. At this time, most of the agricultural work is completed and there is time to go to the forest and collect some food and eat. During this period, availability of various vegetables and fruits is also more at the village level either from kitchen gardens or markets (which start in winter). The availability of food is really greater in winter as compared to the rainy and summer seasons.

The summer adds colours with tangy fruits and flowers. During the three months of summer, the availability of fruits in the forest increases. Grain is also available in the first half of the summer, but mostly for landholders like the Kukana. However, the later part of the summer is particularly bad in terms of food as well as water availability. Agricultural works like preparation of land is also started in this period. The men are often required to migrate during this period thus increasing the burden on women for coping with the harsh conditions and labour.

In sum, as illustrated in the figure below, food availability in winter (indicated by the number of foods eaten) is more as compared to the rainy and summer seasons. Besides this quantitative difference in the number of foodstuffs available, there is also a qualitative difference in the types of foods available in different seasons. Thus during the rainy season, the food from the forest is available more than in the other two seasons, including different types of vegetables, tubers and mushrooms. In summer, the forest brings many types of fruits like karvanda, Adwa, Mango, Bel,

Amali, and Mahuwa flowers. The food scarcity period in the area starts from the second week of May to mid second week of August.



Forest food used during the scarcity period

In tribal communities, the means of livelihood are limited and insufficient. Various economic activities like agricultural work, labour, collection of forest products are available to them, but these cannot provide minimum subsistence needs through out the year. Late summer and early monsoon (June, July, and August) are the worst months in a year.

Uncultivated food from the forest such as tubers like Vara or Lal Kand play a very important and crucial role during food scarcity in summer and early monsoon. For certain tribes, those who do not have granaries, the forest is a provider of food. This availability of foods from the forest is further constrained by a dwindling knowledge about them. It was seen that most of the younger generations were not able to identify or use foods from forests.

Apart from the loss of knowledge regarding traditional forest foods, deforestation and depletion of natural resources, which is evident throughout south Gujarat, is also responsible for the loss of diversity of foodstuffs amongst the tribal peoples.

Pursuit of education and/or employment takes the younger generation further away from the use of indigenous forest produce, as they neither have time nor the inclination for procuring and preparing these for consumption.

In some cases is also a lengthy and time-consuming task. Instead of going to the forest to collect something, younger generations are more attracted by the commercially available foods in the village shops.

Deforestation and, land clearing and levelling for cultivation have further depleted the communities' natural traditional sources. The agricultural practices of cultivating Nagali, Kursani and udid on hill slopes are now replaced by paddy and groundnut cultivation, etc.

II. Reasons of change in Diet

Change in cropping pattern

The area has also experienced a change in the cropping pattern. Earlier **Nagli** was the main crop while now rice paddy cultivation has replaced it thus changing the availability of cereals. This has also resulted in changed food habits e.g. ten years ago tribal people were habituated to eat Nagali (rich in Calcium) at least once during the day along with rice. But now it is gone from their diet and young generations do not eat it. The loss of this millet has resulted in the younger generations' ignorance of this food and led them to false ideas about the low status associated with the consumption of coarse cereals.

Yet another dimension to this change in cropping pattern is the differential market demand for these two cereals and the production of the same. Paddy not only gives better yields per acre than nagli, but also commands much higher price in the market thus improving the farm economics.

Mahua Seeds and Niger were used as oilseeds in the study area. Now it is also in the process of being substituted by groundnut because of better economic returns from the later.

Markets and consumerism

While some of the traditional foods have disappeared from the diet, consumption of some new foodstuffs such as biscuits, potato chips, and fried chips etc. has increased in this area. Working for wages allows the younger generations to purchase these foods.

Adoption of religious sects prohibiting none vegetarian food

Both the men and women mentioned another factor contributing to the change in their diet – adoption of new religious beliefs. A number of Kokanas, for example, have adopted "*Moksh Marg*". It is a socio-religious movement that enrols

individuals to follow a certain way of life. Besides a prescribed set of observances, non-vegetarian food is forbidden. This could also be one of the reasons favouring malnutrition in this area.

Environmental degradation and loss of traditional knowledge

Environmental degradation is also accompanied by the loss of traditional knowledge. Some of the food that is available in the forest but not known to the younger generations includes Tubers like *Kochi Kand* and *Kadu Kand*. Deforestation and an increasing tendency to monoculture have contributed to the loss of biodiversity in the study area, consequently affecting the availability of different local foods and knowledge about them. Some women had heard about these *Kand* through the elder but did not know about any recipe or how to prepare them. The younger generations were also unable to identify tubers and some vegetables. They were not aware about which tubers are edible or which are not. Being able to identify them is important, as the non-edible ones may be harmful to health. Preparation of tubers in some cases is also lengthy and time consuming. Instead of going to the forest and then spending time preparing the food, people prefer to purchase food, as it is easily available in the village shop and easy to cook also. For example, the tuber *Kadu Kand* needs to be washed, boiled, kept overnight immersed in water, and washed again to remove poison substances, and then only it is ready to eat.

Table 9: Foods in declining usage

Name of foodstuff	Known only by few people	Only heard about it and have not tasted it	Disappearing	Only used now for medicinal value
Inda		+	+	
Konchi Kand		+	+	
Vach Kand	+			+
Pev kand			+	
Hari Kano			+	
Digadi Bhaji	+		+	
Hol Enda				+
Lot Bhaji	+			

Source: FGD discussions and interviews with community members

Implications of change in diet

Nowadays, most of the land has been devoted to cash crop production (e.g. ground nut). Generally men are responsible for the sale of the crops and control any profits made. As a result, women are the losers at both ends. They neither have access to the grains nor the money from the sale of cash crops. This situation impacts the type and amount of food consumed in the household as the primary responsibility for food provision rests with women.

Tables 10 and 11 below summarize the types of foods preferred in previous times, and those most commonly used today, as reported from the FGDs and local interviews. The photos and Table 12 illustrate the impoverishment in the typical diet in the study communities (a decline in dietary diversity and nutritive quality from before to today).

Table 10: Food preferred by tribal people before

Name of Foodstuff	Botanical Name	Protein gm	Fat gm	Carbo-hydrate gm	Energy Kcal	Calcium mg	Iron mg	Remarks
1. Nagali	*Eleusine coracana*	7.3	1.3	72	328	344	6.4	• Nagali is a food of the poor. It is a rich source of important minerals (calcium, iron and phosphorous) • Important source of B-Vitamins, especially thiamine and nicotinic acid • It contains blood-purifying properties • Fat content is less so that it is good for calorie conscious person
2. Chokha Hand pounded	*Oryza sativa*	7.5	1.0	76.7	346	10	3.2	
3. Adad	*Phaseolu mungo*	24	1.4	59.6	347	154	9.1	• High protein content like meat • 24 gm protein content per 100gm dry seeds • Heavy to digest • Energy content is also very high (347gm per 100 gm dry seeds)
4. Alu	*Colocasia antiquorum*	3.0	0.1	21.1	97	40	1.7	• Rich in carbohydrates and porvides mainly energy
5. Suran	*Amorphophallus campanulatus*	78.7	0.1	18.4	79	50	0.6	• Rich in carbohydrates • Good sources of energy • shelf life of tubers is 10 to 11 months.

Name of Foodstuff	Botanical Name	Protein gm	Fat gm	Carbo-hydrate gm	Energy Kcal	Calcium mg	Iron mg	Remarks
6. Karsani	*Guizotia abyssinica*	23.9	39.0	17.1	515	300	56.6	• Oil is used in treatment of Asthma • Rich in protein, contain less fat as compared to groundnuts and others • Contains iron more than any other oil seeds • Contains 56.6 mg iron per 100 gm of dry seeds
7. Mahuwa Seeds	*Bassia latifolia/longifolia*							• 20 to 50 percent oil content • Used in daily cooking, Used in treatment of joint pain

Table: 11 Food preferred presently in daily diet

Name of Foodstuff	Botanical Name	Protein gm	Fat gm	Carbo-hydrate Gm	Energy Kcal	Calcium mg	Iron mg	Remarks
1. Chokha Milled (Rice)	*Oryza sativa*	6.8	0.5	78. 2	345	10	3.1	• Contributes as much as 70-80 % calories in diet • Refined rice has a very poor vitamin content • Poor source of two important minerals, calcium and iron • Easy for digestion • Red rice is very nutritious recommended by nutritionist
2. Tuver (red gram)	*Cajanus cajan*	22.3	1.7	57.6	335	73	5.8	• 22.3 gm protein content per 100gm dry seeds • Pulses are rich in lysine therefore good supplementary value to cereals diet • Red gram is deficient in tryptophan
3. Potato	*Solanum tuberosum*	1.6	0.1	23.2	101	50	0.7	
4. Brinjal	*Solanum melongena*	1.4	0.3	4.0	24	18	0.9	
5. Groundnut	*Arachis hypogaea*	3.0	0.1	21.1	97	40	1.7	

Food plate Before

Food plate Now

Table 12. Difference in the diet of tribal farmer

Food item	Content	Before	Now
1	Protein	Good	Low
2	Calcium	Good	Low
3	Iron	Moderate	Low
4	Vit 'A'	Good	Low +
5	Vit 'B'	Good	Moderate

The consumption of nagali is not much in the present diet. So the content of calcium and iron has decreased. Previously, people consumed both types of rice (milled and un-milled). Now they eat only milled rice, thus the intake of Vitamin 'B' and fibers has decreased. Again, due to change in religious and other cultural practices among the tribal people in Vansda area, there has been a shift from non-vegetarian to vegetarian food consumption. Ten years, back their intake of non-vegetarian food was quite high and because of this, the calcium content in the diet has gone down also.

CHAPTER 6: SUMMARY OF FINDINGS AND CONCLUSIONS

Major Findings

- There is severe malnutrition in the study area. The average BMI of women in the study sample was 17.9 with more than 50 percent women having a BMI less than 18.5, and 24% being classified in the severe malnutrition category.

- Consumption levels of traditional foods are higher among adult women.

- Environmental deterioration is accompanied by the loss of traditional knowledge about foods and food diversity. Younger people are less informed about traditional food sources and the preparation of traditional foods.

- Change in cropping pattern and land use practices are another reason for the change in consumption practices that in turn impact the loss of traditional uncultivated foods and the nutritional status of tribal people.

- The loss of indigenous crops (variety) and traditional uncultivated food sources has affected the knowledge level of younger generations on these foods.

- Exposure to market facilities, imported foods, and wage labour has also changed the attitudes towards different foods and eating habits of tribal peoples.

- Proselytism by different religious sects have introduced new religious norms among tribal communities in South Gujarat, changing in turn food habits (eg. fasting and vegetarianism) that can impact the nutritional status of local communities.

Conclusions

This study used an ecosystem approach to human heath with a view to understand malnutrition in the study area. It used BMI as a measure of chronic energy deficiency and indicator of health status. Health was viewed as a state of equilibrium between communities and their surrounding environment. Changes in food habits, and social and ecological determinants behind them that impact people's nutrition and health, were explored in discussions with community members (mainly women belonging to SHGs), local health experts (traditional birth attendants and local healers), and scientific experts.

A participatory process was used to involved local women as part of the research team to study the relationship between the ecosystem and human heath, food availability and human nutrition. The study was carried out in two villages of the Swayamsiddha project area. It documented conventional and non-conventional foods from different sources, including forests, farms, and rivers. The study also examined, in discussion with local people, the change in cropping pattern, land use, and change in agro–ecological conditions though qualitative information techniques for data collection and analysis. The data were collected in three parts: first through focused group discussion in different communities and with different sectors of the communities; through personal interviews with local and outside experts in health and ecology; and thirdly, an important effort was spent in the collection of food samples from their natural habitat, and in their identification with local experts (local women to find out the local name and use of the food items) and then with botanist and nutrition experts to ascertain the botanical names and their nutritive value. If the value was not known, the specimens (raw food only) were sent to the laboratory for testing.

The study revealed how agro-ecological change, as well as social and religious change affects the availability of cultivated and uncultivated food in tribal communities. The loss of uncultivated food and traditional knowledge and practice associated with the food can be linked in the minds of local people to: changes in

land use practices; environmental degradation; exposure to new foods that are easily available and easy to cook; lack of time of women in collecting and cooking traditional foods; loss of prestige status of traditional foods among the younger generations; increased preference for cash crops; new religious norms that affect people's diets. These types of change lead together to some sort of deficiencies in the diets and nutritional status of the women in the study area. The study also found difference of access to uncultivated foods within the communities due to education, age, and cultural differences (e.g. Kotwaliya people did not eat bamboo shoots because they believe bamboo is a source of income and they are like a god for them.

Based on these findings, we prepared a dissemination plan to recuperate local knowledge on traditional foods and promote more diverse and better diets. Food festivals were held in the study communities with this aim in mind in addition to validate many of our findings. Another important output of this research study is the accompanying publication in this Ecohealth Swayamsiddha series: '*Amara Jungalni vangio*, *Delicious Tribal Recipes from South Gujarat*' compiled by Rashmi Dixit, (DHRUVA and BAIF Development Research Foundation, 2005.)

Recommendations

- Sharing of traditional knowledge about foods within the tribal communities though discussions in SHGs, adolescent and youth groups before the peak seasons for these foods.
- Promotion of traditional kitchen gardens having different varieties of tubers as per season, and developing storage facilities which can used to secure more diverse and nutritious diets during the scarcity period (May to July).
- Promotion of tuber crops having medicinal properties and good market value.
- Promotion of traditional millets (Nagali, Vari, Kodra, Bhatali) and uncultivated forest fruits and flowers and vegetables near to house.

- Promotion of traditional social food security systems that include not only grains but also pluses and oilseeds.

- Available food sources need to be documented in all BAIF project areas to safeguard people's indigenous knowledge and preservation techniques as well as recipes.

- Encouragement of events like food festivals and traditional festivals like "TERA", "Devaso" etc.

Dissemination strategy

- Sharing of study findings with women in study area (Chikatiya and Khabala)

- Exhibition in these communities and DHRUVA campus offices of collected seed samples and tubers so that people realize the richness of their heritage

- Sharing of results with BAIF core group, DHRUVA agriculture team, govt. agriculture department and all stakeholders of the study communities (THPs, TBAs, VHGs).

ANNEXES

Annexure 1

Check list for Focus Group Discussion

A) What type of food is available in this area?

B) Can we make the list of all available food?

C) Do you eat all the available food?

D) Is this food available throughout the year?

E) If yes then which are available throughout the year?

F) Can we write the name of available food according to the season?

G) Where these foodstuffs are available in (farm, Forest River)?

H) Can we categorize the available of food as per their different group like tubers, flowers, etc?

I) What type of change observed in the availability of food with respect to time?

J) These foods are for any specific age group or any one can eat it?

K) Is their any food item which is available today but not before?

L) Is their any food item, which was available before but not today?

M) Is their any change in the Food habit of people as per their cast and community?

N) Is their any difference in the food recommended for women, Men, Girl, Boys, Pregnant women?

Annexure 2

Interview Scheduled

General Information: -

a. Name of Women:
b. Name of SHG:
c. Name of Village:
d. Name of Hamlet:
e. Cast:
f. Religion:
g. Educational status:

Sr.No	Educational Status	Mark
1.	Literate	
2.	Illiterate	
3.	Primary School	
4.	Middle School	
5.	Graduate &above	

h. Occupation: - I} Main:
II} Other:
i. Which type of food did you prefer in your daily diet?
j. Which types of food do you like most? (**Vegetable, Non Vegetable)**
k. Which type of food you prefer Tubers, Vegetable, Roots, Grain, etc.
l. Is their any related in your community related to food?
m. If yes, what is the specialty of the festival?
n. What are the different sources where you get food?
o. In which seasons you get more food different sources?
p. Is there any difference in the food habit among you and other tribe?
q. Is there any gender-based difference in your tribe as per the food habit as well as food recommendation concern?
r. Which food you like most?
s. Is their any difference in the food habit of pregnant women, teen-age girls and other women?