

## A STUDY ON THE SURVEY AND DOCUMENTATION OF UNDERUTILIZED CROPS OF THREE DISTRICTS OF NAGALAND, INDIA

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### Abstract

Survey was made in three different districts of Nagaland, India (Mokokchung, Wokha and Zunheboto) by interacting with the people about the plants/parts used by them. Information was also collected on the purpose of use, source of the plants/parts, season of collection, preparation process. Some of the selected plant species were collected from the wild and established in the Departmental experimental garden where they are propagated. The information collected are compiled according to category like, wild, cultivated, used for vegetable, medicines and others.

**Key words:** Underutilized crop, Nagaland.

### INTRODUCTION

With ever-increasing population pressure and fast depletion of natural resources, it has become extremely important to diversify the present-day agriculture in order to meet various human needs [1]. Plant biodiversity represents the primary source for food, feed, shelter, medicines and many other products and many life on earth possible and enjoyable [2, 3]. In prehistory, in various parts of the world, our forbears brought into cultivation of few hundred species from the hundreds of thousands available and in the process of domestication transformed them to crop plants though genetic alternation by conscious and unconscious selection. The number of plant species used by humans around the world is only one third of the number of species which generations of diverse cultures around the world have drawn upon to develop crops that would meet specific needs. The centers of diversification of most common cultivated species are known today, but for many other species of local importance, the knowledge on distribution of their genetic diversity and use patterns are still largely limited [3].

Through a long sequence of trial and error, relatively few plant species have become the mainstay of present day agriculture. Some of the most important crops consume directly by humans are sugarcane, rice, wheat, maize, potato, cassava, sweet potato, soybean, banana, tomato, yam, orange grape, sorghum, apple, coconut, oat, peanut, rye, etc. Most of them are very rich sources of vitamins, minerals and other nutrients such as carbohydrates, proteins and fats [4]. Our substance as a species is now based on production of these species. However, at present,

only 150 plant species are used and commercialized on a significant global scale, over 50 % of the world's requirements for calories are met by only three crops i.e., rice, wheat, maize. Yet, there are ~700 estimated species that play a crucial role in poor people's lively hood and may have a significant potential for commercialization. Alongside their commercial potential, many of the underutilized crop species also provide important environmental services, as they are adapted to marginal soil and climatic condition.

The underutilized crops are species that are used traditionally for food, fibers, fodder, oil or medicinal properties. They have an under-exploited potential to contribute to food security, nutrition, health, income generation and environmental services. These underutilized crops have been included in world-wide plans of action after having successfully raised the interest of decision makers.

Considering the importance of the crops as food, medicine and for industries, these underutilized crops can be exploited at the commercial level. The high nutritional qualities indicate that the cultivation and consumption of these crops may be helpful in overcoming the nutritional deficiencies predominant in many rural areas of the country and boost the socio-economic condition of the society. With ever increasing population and consequent shortage of food grains, collection and utilization of various types of unutilized crops are considered very essential. The Global Action Plan for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture, adopted at Leipzig, Germany in June, 1996, also gave clear priority to the conservation and use of minor and

underutilized crop species (Priority Activity Area 20: Promoting Development and Commercialization of Underutilized Crops and Species, FAO 1996) [5].

The state of Nagaland is a remote tribal state in North-East India and is very rich in floristic diversity. In Nagaland the angiosperm is represented by over 2500 species belonging to 963 genera and 186 families [6]. Most of the species are of economic importance and play a vital role in rural economy [7, 8]. Apart from their use as source of food, some are important due to their medicinal properties, vegetables, fibers, construction materials, dyes etc. Unlike most staples, many of the neglected species are adapted to various marginal growing conditions such as those of the arid areas, salt-affected soils etc. Further, many crops considered neglected at a global level are staple at a national or regional level, contribute considerably to food supply in certain periods (e.g., indigenous fruits) or are important for a nutritionally well-balanced diet (e.g., indigenous vegetables, cereals, pulses etc.). These crops are frequently forgotten in development work, although having a real potential to contribute to sustainable food production and to food security. The preservation of plant genetic resources of promising as well as threatened types for posterity needs top priority. Present study was undertaken to survey and document the underutilized crops of three different districts of Nagaland (Mokokchung, Wokha and Zunheboto), India.

#### METHODOLOGY

The main objective of the present study was to identify the key information sources and to systematically compile, analyze and disseminate information on a selected set of neglected crop species/gene pools with a view to facilitate the development of a well targeted global plan of action to improve their conservation and use. Survey was conducted in three different districts of Nagaland (Mokokchung, Wokha, Zunheboto) in different seasons of the year and collected the information on the un-exploited/under-exploited crops/plant species used by the Naga society. Some selective plants are collected from the wild and established in the departmental experimental garden. Based on the information collected, the crops are divided according to their use.

#### RESULTS AND DISCUSSION

During the survey and collection, a total of 41 species of under exploited crops have been identified and collected (Table 1). The different parts of these are used by the people of these three districts of Nagaland. These plants/parts contribute significantly in the food of rural masses of these districts. These plant resources have the potential to uplift the economic condition of the local people and add to food security. However, availability of most of these wild crops are now depleting rapidly owing to various factors such as '*Jhum/shifting cultivation*', forest fire, felling of trees for timber and other socio-economic anthropogenic activities in the area. Therefore, it need of the hour to conserve these forest wealth and workout the ways for commercial scale propagation of these plant species.

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**Table 1:** Wild plants/plant parts used by people of Nagaland

<b>Botanical name</b>	<b>Family</b>	<b>Part(s) used</b>	<b>Mode of use</b>	<b>Cultivated/wild</b>
<i>Amomum dealbatum</i>	Zingiberaceae	Ripped Seeds	Eaten raw	Wild
<i>Ardisia crispa</i>	Myrsinaceae	Fruits	Ripped fruits eaten raw	Wild
<i>Artocarpous chaplasha</i>	Moraceae	Pulp, seeds	Young fruits and seeds taken as vegetable	Wild, cultivated
<i>Alocasia macrorrhiza</i>	Araceae	Fleshy petiole	Ingredient for making fermented food (from dry fish)	Wild
<i>Alpinia nigra</i>	Zingiberaceae	Rhizome, shoots	Cooked as vegetable	Wild
<i>Amaranthus viridis</i>	Amaranthaceae	Shoot	Cooked as vegetable	Wild, cultivated
<i>Bauhinia variegata</i>	Caesalpiniaceae	Immature fruits, flower	Fruits are eaten fresh, flowers as vegetables	Wild
<i>Calamus tenuis</i>	Arecaceae	Fruits	Eaten raw	Wild
<i>Centella asiatica</i>	Apiaceae	Whole plants	Eaten raw or cooked	Wild
<i>Capsicum</i> sps.	Solanaceae	Fruits	Eaten raw or cooked	Wild, cultivated
<i>Colocasia gigantea</i>	Araceae	Whole plant	Cooked as vegetable	Wild
<i>Clerodendron indicum</i>	Verbenaceae	Leaves	Cooked as vegetable to reduce blood sugar and pressure	Wild
<i>Cucurbita maxima</i>	Cucurbitaceae	Fruit	Cooked as vegetable	Wild, cultivated
<i>Curcuma aromatica</i>	Zingiberaceae	Rhizome	Used as spice	Wild, cultivated
<i>C. angustifolia</i>	-do-	Flower	Cooked as vegetable	Wild, cultivated
<i>Dioscorea glabra</i>	Dioscoreaceae	Tuber	Roasted or cooked as vegetable	Wild
<i>Dioscorea villosa</i>	-do-	-do-	-do-	-do-
<i>Diospyros kaki</i>	Ebenaceae	Ripe fruits	Eaten raw	wild
<i>Embilica officinales</i>	Euphorbiaceae	Fruits	Eaten raw or roasted	Wild
<i>Ficus benghalensis</i>	Moraceae	Young leaves	Cooked as vegetables	Wild
<i>Hedychium flavum</i>	Zingiberaceae	Rhizome	Cooked as vegetable	Wild
<i>Houttuynia cordata</i>	Saururaceae	Whole plant	Eaten raw or cooked or added in pickle	Wild
<i>Ipomoea batatas</i>	Convolvulaceae	Underground root stock	Eaten roasted or cooked	Wild
<i>Justica adhatoda</i>	Acanthaceae	Leaves	Eaten raw or cocked	Wild
<i>Livistonia jenkinsinia</i>	Arecaceae	Young fruit	Eaten raw, prepared pickle	Wild
<i>Mentha avensis</i>	Lamiaceae	Whole plant	Eaten raw, cooked, fried	Wild, cultivated
<i>Musa paradisiacal</i>	Musaceae	Stem, inflorescence	Eaten raw or cooked	Wild
<i>Oroxylum indicum</i>	Bignoniaceae	Fruits, young leaves	Fruits eaten raw, leaves used as vegetable	Wild, cultivated
<i>Parkia javanica</i>	Mimosaceae	Fruit, flowers	Fruit as vegetable, flowers used in salad	Wild
<i>Plantago erosa</i>	Plantaginaceae	Leaves	Cooked as vegetable	Wild
<i>Prunus cerasoides</i>	Rosaceae	Fruit	Eaten raw	Wild
<i>P. domestica</i>	-do-	Fruit	Eaten raw	Wild, cultivated
<i>Pyrus communis</i>	-do-	Fruit	Eaten raw	Wild
<i>Rhus hookeri</i>	Anacardiaceae	Fruit	Eaten raw	Wild
<i>Solanum torvum</i>	Solanaceae	Fruit	Eaten raw, fried	Wild
<i>Spondias mangifera</i>	Anacardiaceae	Fruit	Eaten raw	Wild, cultivated
<i>Sterculia urens</i>	Sterculiaceae	Seeds	Seeds roasted or cooked	Wild
<i>Syzygium jambos</i>	Myrtaceae	Fruit	Eaten raw	Wild
<i>Terminalia bellirica</i>	Combretaceae	Young and Mature fruits	Eaten raw	Wild
<i>T. chebula</i>	-do-	-do-	Eaten raw	Wild
<i>Zalacca secunda</i>	Arecaceae	Young fruits	Eaten raw of cooked	Wild

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