

CHAPTER VI

WILD PLANT UTILIZATION BY HMONG WOMEN

This chapter outlines wild plant species for household uses known by Hmong people in Huay Hoi village. These wild plants were gathered from nearby forests. Usefulness of these plants, pattern of uses, part of uses, local names, frequency of gathering were asked by the author. After that, scientific name of these gathered wild plants were specified by an expert from the Chiang Mai University herbarium. In this chapter, species of wild plants, its usefulness, its utilization by women, and the amount of estimated quantities of uses in one year were given.

6.1. Wild plant for household utilization

Hmong people produced cash crops for their livelihood. Currently, they did not have enough time to gather wild plants because most of them spent time to produce cash crops for sale and consumption. They produced cash crops at least 4 times a year. Especially, since women spent a lot of time on both fieldwork and housework, time for gathering wild plant decreased. Normally, most women would use wild plants for household consumption and use.

Wild plant utilization by Hmong people could be separated into two kinds i.e. for household uses and for sale. Household purposes includes for food, medicine, fuelwood, and fodder and utilization for sale includes mushrooms and some species of wild herbs. Most villagers did not often sell these gathered wild plants because they could get money more from sale vegetables and fruit trees.

The villagers gathered wild plants for many reasons. They collected wild plants and other non wood forest products for household uses and for sale. In Huay Hoi village, traditional livelihood system was semi - subsistence system. At present, their livelihood changed to semi-commercial system as they would planted vegetable and fruit trees for sale but they still collected forest products for daily life and grew rice for household consumption. In this study, the collection of wild plants was mainly for household uses while there were not many species for sale as some medicinal plant species. Table 19 presented the amount of wild plants for household uses and sale. 100 percent of total amount of bamboo shoots, fodder, and fuelwood were for household use. Other food plants, some species of mushroom, and some species of medicinal plants were collected for sale in a portion of 11.5, 3.8, and 5.7 percent from total amount collected.

Table 19 The household collection of wild plants in Huay Hoi village

Type of wild plants	Amount of household collection	Percent of household collection	
		Use (%)	Sale (%)
Bamboo shoots	52	52 (100)	0 (0)
Mushroom	16	16 (30.8)	2 (3.8)
Other food plants	35	25 (48.1)	6 (11.5)
Medicinal plants	14	14 (26.9)	3 (5.7)
Fodder	48	48 (100)	0 (0)
Fuel wood	52	52 (100)	7 (13.5)

Source: Survey, 2002

Note () percent of household collection

From the survey by walking in the nearby forest about 1 – 5 kilometres from Huay Hoi village, it was found that 110 wild plant species were known and used in daily life by villagers (Appendix A). Sources of some wild plants are not fixed. Villagers would go and collect some wild plants and on the way they collected other plants that they saw. Wild plants species collected by Hmong can be grouped in four categories namely food, medicine, fodder, and fuelwood. Some collected species could be used for more than one purpose such as food – fodder and food – medicine. The species of wild plants that were used by the Hmong people in the study village were summarized in Table 20.

Table 20 Wild plant species which were gathered by the Hmong people in Huay Hoi village

Groups of wild plants	Species of wild plants (plants)	Number of species	
		Women	Men
Food	42	42 (38.2%)	42 (38.2%)
Medicine	57	51 (46.4%)	36 (32.7%)
Fodder	4	4 (6.3%)	4 (6.3%)
Fuelwood	7	7 (3.6%)	7 (3.6%)
Total number of species	110 (100%)	104 (94.5%)	89 (80.9%)

Source: Survey, 2002

Note : (...) percent of gathered wild plants

Table 20 presented species of wild plants, which were gathered and/or collected by women and men. The study found that 57, 42, 4, and 7 species of wild plants that villagers gathered from nearby forests as medicine / medicinal herbs, food, fodder, and fuelwood respectively. Women knew gathered wild plant species more than men. Women knew 95.4 % while men knew 80.9 % of all gathered wild plant species. Most women and men knew similar wild plants species as food, fodder, and fuelwood accept wild plants as medicine, women knew about them more than men. Women knew 51 species of medicinal plants while men knew 36 species.

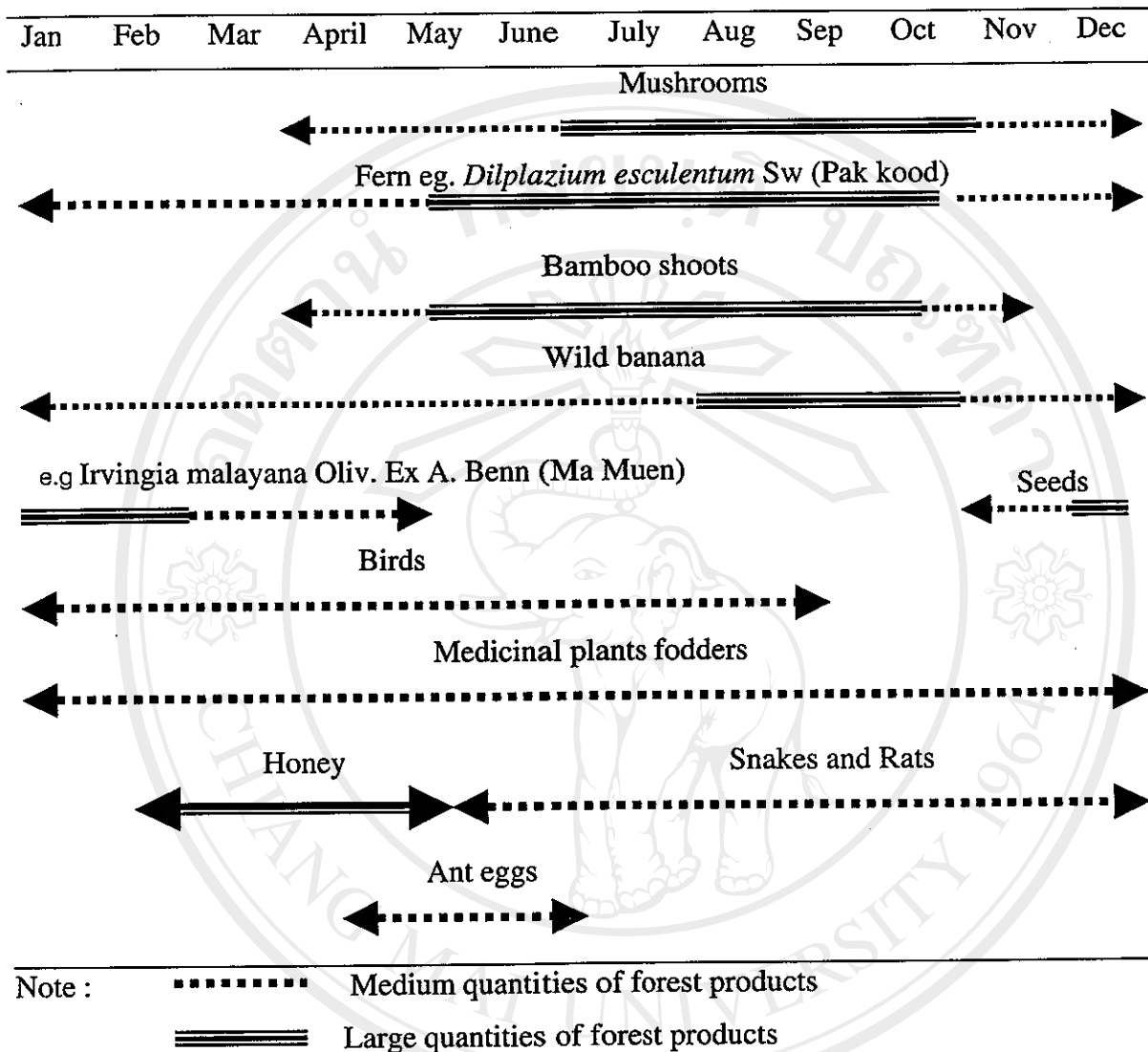
These gathered wild plants were located around the fields and forests nearby the village. The details are described below.

6.1.1. Food

Household use of potential wild plants can be considered for food plants, food additives, animal food, material, fuel, medicine, and social uses. In term of food, no households depended entirely on wild sources. Normally, wild plants for food were considered in three ways i.e. eaten raw, consumed after cooking, and consumed after processing. Eaten - raw wild food were the majority of way to consume wild plants and mainly collected from young plants, such as include tuber and flower of Musaceae species (*Musa balbisiana* Colla), leaves of *Melientha suavis* Pierr., root of *Amorphophallus campanulatus* Blum, and such plants were either boiled in water or cooked with oil and eggs or meat. Some plants required processing before being eaten by boiling some type of mushroom (*Russula sanguinea*, *Termitomyces fuliginosus* Heim, and *Lentinellus praerigidus* Berk) and leaves (*Dilphazium esculentum* Sw.) which are boiled to destroy poisonous chemical before eating or cooking.

In addition, the contribution made by wild plants to households varied according to the season or time of year. Seasonality of the agricultural cycle and food availability was usually linked to rainfall. Seasonal variation in food availability in this village was different in each season. In the dry season, food is mainly produced from cultivated fields. At the same time, if they had adequately free time, they would gather food from the forest. Main food plants that were gathered in the dry season were mushroom, bamboo shoots, leaves, and nuts, and other forest products such as honey, ant eggs, and some wildlife species (Rat, and wild birds) while in the rainy season, they could gather more diversity of wild food. The rainy season was the main season for gathering wild food such as leaves, bamboo shoot, mushroom, and fodder for animals (Table 21)

Table 21 Seasonal calendars of main forest products of the study area



Fields, hills, and forests were resources, which provide food for family. Green items were food, which could not be missed in the meals of the Hmong. Gathering and using wild plants for food was still prevalent in this village. The wild plants were gathered in the fields, hill, and the nearby forests, and they were used in both fresh and processed states before use.

The interview found that the main dishes of Hmong contained rice, salt, and vegetables. Vegetables could be produced in home garden and fields, and gathered from weed, shrubs, and vegetable in every meal however they bought some greens from a nearby village food shop for cooking. They consumed these greens fresh and processed.

There were 42 species of food plants (non – cash crops) that they collected from nearby forests (Table 1 in appendix A). For their food, they gathered bamboo shoots from the forests near their fields and some households would grow bamboo near their houses for household food. Plants that were gathered from the forest and fields were used in many parts of plants such as baby leaves, tubers, shoots, fruits, and roots. The popular parts of plants that were much in use for food were young leaves.

The study found that plant leaves were used for household consumption more than other part of plants, there were 22 species (52.4 %) of gathered wild food in which leaves were used as food and food ingredients. Other parts of plants that could be used were flowers, seeds, roots, tubers, and all parts of these plants (Table 22). There were 7.1 percent of shoots, roots, and young plants and 9.5 percent of fruits and all part of plants could be used as food in household consumption. There were 2.4 percent of total wild food species in which flowers, stem, and seeds were used as food.

Table 22 Wild food plant species classified by parts of use

Part of use	Wild plants species (plants)	
	Number of species (plants)	Percent (%)
Leaves and baby leaves	22	52.4
Fruits	4	9.5
Roots	3	7.1
Stems	1	2.4
Young plants	3	7.1
Flowers	1	2.4
All part of plant	4	9.5
Seeds	1	2.4
Shoots	3	7.1

Source : Survey, 2002

Most households in this village still relied on forest because they collected and gathered some wild plants from the forests for household food consumption. Most women in each household would spend time to gather wild plants. They would not gather every day but at least 2 – 3 times a week, they would gather some wild plants in nearby forest. They spent 1 – 2 hours for gathering wild plants each time. Popular species that were gathered every time include tuber and flower of wild banana, bamboo shoots, fresh fruits of *Solanum torvum* Sw.(Ma kaeng) and Pak kood (*Dilphazium esculentum* Sw). They mostly walked with their neighbors or friends to collect these wild plants. In the rainy season, they gathered wild plants species more than in other seasons. From this survey and from the forest walk with women and men in wild plant gathering, it was found that there were 42 species of wild food plants. Lists of wild food species, which gathered by women and men show in table 23.

This table showed that the popular wild food plants that gathered from the forest, the popular wild food were flowers, tuber, and fruits of wild banana, bamboo shoot, mushroom, leaves of Pak Wan Pah and Pak Kood. Root of Kra book, and *Amaranthus viridis* Linn.

Table 23 The examples of quantities of popular wild food plants per year

Scientific name	Local name	Part of use	Amount of gathered (units/year)
<i>Dilphazium esculentum</i> Sw	Pak kood	Young leaves	74 kilograms
<i>Musa balbisiana</i> Colla	Banaba	Flowers	18 flowers
		Tubers	26 trees
		Fruits	30 hands
<i>Melientha suavis</i> Pierr	Kra boog	Roots	54 kilograms
<i>Solanum torvum</i>	Ma kaeng	Fresh fruits	24.5 kilograms
<i>Russula sanguinea</i>	Mushroom	All	14.5 kilograms
<i>Termitomyces fuliginosus</i> Heim	Mushroom	All	14.8 kilograms
<i>Lentinellus praerigidus</i> Berk	Mushroom	All	11.5 kilograms
<i>Bambusa arundinaceae</i>	Bamboo	Shoots	52 kilograms

Source : Survey, 2002

6.1.2. Medicinal plants

Medicinal plants defined as those that were commonly used in treating and preventing diseases and that were generally considered to have a beneficial role in health care. At present, There was no record of their traditional use.

Eighty percent of the world population were dependent on medicinal medicines and medicinal plants for their health. The conservation of medicinal plants was an important to survival of indigenous people. To conserve medicinal plants for indigenous people's health, data collection on plant species that had been used for traditional medicine was very necessary (Srah, and Luis, 1993).

In Huay Hoi village, individuals acquired knowledge of medicinal plants at different levels on their age, experience and length of time they had practiced herbal, medicinal plants, living place, and access to herbal resources. The study found that local people used medicinal plants to treat common illness suffered in their daily life. In fact, there were about five persons in Huay Hoi village that were specialists in herbal medicine. The specialists of herbal medicine are people who were more than 50 years old. Medicinal collectors were people who are in age 20 – 50 years old while villagers who were less than 20 years old hardly ever knew about medicinal plants. Women were the main gatherers of wild plants for food and medicine. They obtained a repertoire of knowledge about these wild species and their classification of wild plants. Their knowledge was linked to the division of labor among their families.

Men were responsible for the tasks which were claimed to be men's tasks and required men's strength and skills such as seed selecting, fertilizing, and timber collecting. While women were responsible for almost workers in the families including take care of family's member health, which require women to know the way of treating common illness. On the other hand, division of labor had made knowledge of women and men specialized into different areas. Men obtained good knowledge about timber plants, hunting wild animals, and pesticide substances while women were knowledgeable in food and medicinal plants.

The number of local medicinal plants were used by villagers varies according to their experience, age, and knowledge. The older experts had knowledge about

medicinal plants much more than the younger ones. When giving treatment, the local expert often combined these medicinal plants into a package of herbal medicine. One medicinal plant could be used for different purposes or different diseases. This knowledge showed through the way they used and applied them. In some plants only the bark, leaves, roots, flowers, or seeds, and fruits could be used. Recently, some families planted medicinal plants in their home garden only those for treat common illnesses.

The Hmong used some plants, herbs, and trees as medicinal plants by using leaves, roots, stems, and flowers to treated not so - serious symptom. Simple methods such as boiling and drinking water, pounding and putting on problem skin, cooking with chicken and eggs, and taking it fresh were applied. They often used these medicinal plants by using a single plant or mixing with other plants. They used these plants to treat common symptom including cold, cough, fever, stomachache, headache, bone symptom and pregnancy (Table 24).

Table 24: Examples of pattern of use of medicinal plants to reduce common illnesses.

Symptoms	No.of species	Part of used	Pattern of use
Cough	2	Root	Boil and drink
Fever	2	Leaves, stem	Boil and drink
Bone symptom	3	Leaves	Squeeze the leaves and put on the problem area
Pregnant	8	Leaves, stem, root	Boil and drink
Stomachache	3	Root, leaves	Boil and drink

Source : Survey, 2002

From this survey, there were 3 persons in each group of women and men selected because they had knowledge about wild plant utilization. Among people who had knowledge about utilization were old people and some members of housewife group. Source of medicinal plants collected far from Huay Hoi village about 1 – 5 kilometres.

On the other hand, wild plant species were collected from the forests around Huay Nam Chang village because tradition doctors had much knowledge about wild plants as medicinal plants. Housewives group from Huay Hoi learned about these wild plants from them. Thus, collection of wild plants from Huay Nam Chang which was 5 kilometers far from Huay Hoi village would help us to learn more about wild plant utilization. The study found that there were 22 medicinal plant species in this area and area 1 – km far from Huay Nam Chang village.

These medicinal plants gathered by women include 37 and 22 species from the forests nearly Huay Hoi and Huay Nam Chang village, respectively. While men gathered 33 species of medicinal plants from both the forest nearly Huay Hoi and Huay Nam Chang village. Table 25 show that example of medicinal plants that gathered from the forest nearly habitation and crop fields and in Table 2 in appendix A showed all of medicinal plants that were gathered by the villagers.

Table 25 Examples of medicinal plants that were gathered from the forests nearby village and crop fields

Scientific name	Family name	Local name	Part of use
<i>Desmodium multiflorum</i> Dc.	Leguminosae, Papilionoideae	Tontong	Roots
<i>Polygonum chinense</i> L.	Polygonaceae	Chou Kao	Leaves
<i>Robus ellipticus</i> J.E. Sm. Forma obcordatus Franch.	Rosaceae	Por	Leaves
<i>Lygodium flexuosum</i> (L.) Sw.	Schizaeaceae	Chour	Roots
<i>Mussaenda parva</i> Wall. ex G. Don	Rubiaceae	Tong	Roots
<i>Dalbergia oliveri</i> Gamb. ex Prain	Leguminosae, Papilionoideae	Kor Chong	Leaves
<i>Asparagus filicinus</i> Ham. Ex D. Don	Liliaceae	Cher Jee	Leaves
<i>Maesa Montana</i> A. DC.	Myrsinaceae	Mai Mue	Leaves
<i>Toddalia asiatica</i> (L.) Lmk.	Rutaceae	Por Chin Muo	Leaves

Source : Survey, 2002

Since utilization practice of medicinal plants was the tradition knowledge of local people, men and women in the village would share the knowledge of knowing and recognizing medicinal plants. At the level of recognizing medicinal plants, women and men acquired knowledge from their parents and old experts in their family. In their daily life, both women and men would go with their mother to carry medicinal and food plants from the forest. Their mother could tell them about the place to find their desired medicinal plants and characteristics of those plants. In that way, they could gradually recognize medicinal plants among other plants though they might not know how to process or use them. The knowledge acquired by women and

men was different. Women accompany their parents to the forests more often than men and they pay attention to medicinal plants that their mothers collected and their usage than men.

In some old but knowledgeable households, the members were too old to collect and carry medicinal plants and some medicinal plants were in the forests that were very far from their village and they could not walk to collect them. Thus, they often followed by daughters or sons who can carry medicinal plants for them. However, daughters or sons and grand daughters or grand sons did not to know all medicinal plants.

6.1.3. Fuelwood

The gathering of fuelwood was to supply their daily domestic energy. Normally, households collected their fuelwood from privately owned land or from open – access forests and common – property village land.

All of interviewed households used fuelwood for cooking and heating. It was found that four popular plant species gathered by both women and men. However, some households could get fuelwood by buying fuelwood from outside sources or from merchants. Normally, men collected fuelwood from the forest more than women. They spent 2 – 3 times per year while women spent 1-2 times per year for fuelwood collection. It took an average of 8 – 10 hours to collect one round by pick up truck and 1 – 4 hours to collect one basket. Only in the households that had trucks, men usually gathered fuelwood and carried it back home in these trucks. For the households no trucks, they gathered fuelwood in baskets and carried them back home.

Table 26 Examples of species of fuelwood collected

Scientific name	Family name
<i>Pinus kesiya</i> Roy. ex Gord.	Pinaceae
<i>Pinus merkusii</i> Jungh. & De Vriese	Pinaceae
<i>Quercus brandisiana</i> Kurz	Fagaceae
<i>Irvingia malayana</i> Oliv. Ex A.Benn.	Ixonanthaceae
<i>Shorea siamensis</i> Miq	Dipterocarpaceae
<i>Morinda tomentosa</i> Heyne ex Roth.	Rubiaceae
<i>Dipterocarpus tuberculatus</i> Roxb.	Dipterocarpaceae

Source : Survey, 2002

Table 26 shows that there were seven popular wild plant species that were used for fuelwood. This fuelwood species were popular to use because there was not too much smoke when they were burned. Normally, villager collected fuelwood from dead trees in the forests. The average quantities of fuelwood collected in basket by women were 915 kilograms per year per person. Men collected fuelwood in baskets less than women because they usually collected fuelwood in trucks. The average quantities of fuelwood collected in basket by men were 750 kilograms per year per person. For fuelwood that were gathered by men in trucks, average quantities were about 300 kilograms each time and 900 kilograms per year (Table 27).

Table 27 The average quantities of fuelwood collected by women and men per year

Fuelwood collecting	Quantities of collected fuelwood (Kiolgrams)			
	Women	Times per year (Times)	Men	Times per year (Times)
Pick up truck	-	-	900	3
Basket	915	61	750	38

Source : Survey, 2002

6.1.4. Fodder

Most Hmong households raised pigs and chicken because they provided food and income from these animals. Women and their children would take care of them. Most of food for pigs came from vegetables, rice bran, and some plants from forest. These vegetables came from two sources, which were planted in their fields, and from the forests. For chicken, they fed them by vegetables and corn, which were harvested from vegetable fields. Thus, fodder in this study was used for pigs only because they ate a lot of fodder and pig owners did not enough food for their pigs. Thus, pigs owners must collected some more fodder from the forests.

There were two popular wild species of fodder, which gathered for pigs, include wild banana (*Musa balbisiana* Colla) and Lai – Hao (*Amaranthus viridis* Linn) (Appendix A). These wild fodders were gathered from nearby forest around Huay Hoi village. Villagers could get these fodders in the rainy and dry season. In the dry season, these fodders were gathered less than in the rainy season because they could grow in the rainy season better than the dry season.

Fodder was collected and gathered in baskets, they collected and gathered other plants that they eat on the way. Then, they carried these plants back home. Quantities of fodder that they gathered are 10– 20 kilograms in their baskets each time depend on amount of their pigs, number of gatherers, and their free time. All year

round, both women and men gathered fodder from the forest about 104 and 48 times. They gathered average amount of fodder about 728 and 336 kilograms per year per person for women and men respectively (Table 28).

Table 28 Average amount of fodder gathered by women and men per year

Fodder collecting	Quantities of collected fuelwood (Kiolgrams)			
	Women	Times per year	Men	Times per year
		(Times)		(Times)
Fodder	728	104	226	48

Source : Survey, 2002

6.1.5. Time spending for wild plant collection

Wild plant collection in each household was a way to collected food for household consumption. Most villagers would spend time after agriculture work for collect food around their fields and nearby forest. In each collection time, the villagers would not collect in large amount of wild plants because they would collect these plants in amount for 1-2 meals. Therefore, they did not spend much time for wild food plant collection each time. However, time spending for collection would depend on the distance of sources of wild plants. Details of time spending for wild plant collection was described in Table 29. The study reported that the villagers spent time for wild plants as household food more than other purposes, average time spending for wild food plant collection was 109 hours/year. In fodder, medicinal plants, and fuelwood contain in a truck and baskets collection would spent 79, 9.1, 48, and 97.5 hours/year respectively.

Table 29 Time spending for wild plant collection among interview villagers

Type of wild plants/forest products	Time spending (hours/time)	Total amount of times (time/year)	Total time spending (hours/year)
Food	0.42	260	109.2
Medicine	0.57	16	9.1
Fodder	0.38	208	79.0
Fuelwood (Pick up truck)	8	6	48
Fuelwood (Basket)	1.5	65	97.5

Source : Survey, 2002

In term of gender, there was different time spending for wild plant collection between women and men. Women would spend more time for food and fodder collection than men. They would spend 175.9 and 60.8 hours/year while men spent 82.5 and 18.2 hours/year in wild food plant and fodder collection. Fuelwood collection, women would only collect them and carried them in their basket while men would collect fuelwood and transport it by trucks because men would collect fuelwood in areas that were far from the village. The time of fuelwood collection that using trucks would be less than that using baskets (Table 30).

Table 30 Time spending for wild plant collection of women and men

Type of wild plants/forest products	Total time spending (hours/year)	
	Women	Men
Food	175.9	82.5
Medicine	9.1	9.1
Fuelwood (Pick up truck)	-	48
Fuelwood (Basket)	97.5	57
Fodder	60.8	18.2

Source : Survey, 2002

6.2. Indigenous knowledge in wild plant utilization by Hmong women

The villagers in Huay Hoi village still relied on the forests and they had knowledge about wild plant utilization in their livelihood. This knowledge was transferred to new generation in this community as their indigenous knowledge of local people. They presented this knowledge on wild plant utilization in various patterns. Some wild plants and their products were consumed or used as fresh and raw materials and some wild plants need to process before consumption or uses in other seasons. Women knew about indigenous species of vegetables leaves in this area including how to recognize and prepare them. In the study periods, there were many activities that showed indigenous knowledge of Hmong villagers especially women in wild plants utilization by women. In this section, indigenous knowledge in wild plant utilization in household uses especially for household food consumption is outlined.

The knowledge of wild plant utilization was grouped into the utilization in the household as food, ingredients of food, and medicine. Hmong women in Huay Hoi village knew 42 wild food plant species, 51 medicinal plant species and how to use this wild food plants in their household. Wild food plants were used in each meal. Examples of food in each meal of Hmong households showed in Table 13 in Chapter V. In some meal, they would mix wild vegetables or some wild plants in their food. The table below presented wild plant species which were used in some meals.

Knowledge of utilization were used and transferred by older generation to younger generation which started from mother to daughters or sons. Species of wild food and medicinal plant utilization were showed in Table 31. In terms of knowledge in wild plant utilization, it was found that women and men had different pattern of uses since from tasks in their livelihood. From this survey, women could describe about utilization of wild plants i.e. wild food and medicinal plants.

In this study, it was found that Hmong would collect some wild plants, animals, and other products from the forests for household food. In rainy season, they could get more wild food than in the dry season especially wild food plants and they could consume whole young plants. There were examples of food that were prepared from wild plant species in Hmong households in rainy season. Popular menu in this season for breakfast was fried bamboo shoots with eggs or boiled and ate with paste from fermented soybean or meat but not spicy, fried *Dilplazium esculentum* Sw. with oil and a little chili or boiled with mixed also wild vegetables (*Dilplazium esculentum* Sw., *Drgea volubilis* Stapf, and *Bidens pilosa* L. Var. minor (Bl.) sherff) and vegetables from field plots, and boiled taro with pork or long bean. For lunch, they would eat some food that was easy to do such as boiled instant noodles and vegetable from field plots and around field plots, fried mixed vegetables around crop fields with eggs, fried *Crassocephalum crepidioides* (Bth) S. Moore with other wild vegetables and chili paste, boiled taro or *Dilplazium esculentum* Sw. in case of their crop fields near streams or water sources and so on. At dinner, they ate many types of food because all members would talk and discuss about every thing in dinner time. They would cook many types of food with vegetables such as vegetable soup with meat i.e. pork and chicken, boiled mixed vegetables and eat with not spicy chili paste, boiled chicken with some medicinal herbs, fried vegetables with eggs, and boiled or fried instant noodles or canned fish with vegetables.

Table 31 Examples of wild plant species that used as food in household consumption

Type of food	Wild plant species
Fried bamboo shoot	- <i>Bambusa arundinacea</i> Wild
Fried chili paste (not too much spicy) with fresh vegetables	- <i>Drgea volubilis</i> Stapf - <i>Dilplazium esculentum</i> Sw. - <i>Melientha suavis</i> SW. <i>Crassocephalum crepidioides</i> (Bth) S. Moore
Chili paste, boiled bamboo and grilled pega	- <i>Bambusa arundinacea</i> Wild - <i>Oroxylum indicum</i> Vent
Boiled mixed vegetables with chili paste	- <i>Dilplazium esculentum</i> Sw. - <i>Drgea volubilis</i> Stapf - <i>Bidens pilosa</i> L. Var. minor (Bl.) sherff
Mixed vegetables and bamboo shoots soup, grilled fish (hardly ever do fish grilling)	- <i>Bambusa arundinacea</i> Wild - <i>Gynura pseudo – china</i> (Linn.) DC - <i>Amaranthus viridis</i> Linn
Taro soup with chili paste	- <i>Colocasia esculenta</i> (L.) Schott - <i>Termitomyces tyleranus</i> otieno - <i>Russula sanguinea</i>
Canned fish, mixed vegetables and mushroom soup	- <i>Termitomyces fuliginosus</i> Heim - <i>Lentinellus praerigidus</i> Berk
Grill fish and taro soup with chili paste	- <i>Colocasia esculenta</i> (L.) Schott

Source : Survey, 2002

In Hmong communities, they believed that there were many causes of people illness including:

Spirits or ghosts

Hmong believed that spirits or ghosts could make people sick. There were many types of spirits or ghosts according to their beliefs such as household spirits, door spirits, ancestor spirits, forest spirits, anthill spirits, tree spirits, field spirits, and so on.

Morale spirits and heart spirits (Khawn)

Hmong believed that human being had two component parts: the body and kwan. Kwan was the circle or whorl of hair behind the top of the head. The kwan of a person was most sensitive and wont to leave the body and wander. The Hmong had a ritual to recall the khwan in order to cure illness and to tie up the wrist if the sick person to prevent the khawn from leaving the body. If khawn leave the body, villagers would be sick. Then, the villagers bring back one's spirits by ancestors. They would propitiate the spirits by a sacrifice or offering of food such as chicken, milled rice, and so on.

Weather

Changing of weather was a cause of illness such as cough, cold, and fever in winter or in a day that had very high temperature.

Life breeze

Hmong believed that there were air in human body and the air flew in the same ways but the airflow was turned back, people would be sick. Illness that causes from life breeze was stomachache, pain in the stomach, and pain in muscles.

Diseases and germs

Diseases and germ were causes of illness such as stomachache, digestive disorder, and colic.

Unluckiness

Hmong believed very much in luckiness and unluckiness that caused people's illness.

When there were people who were sick in the household, household members would diagnose the illness by their experiences. Then, they would treat it by traditional methods i.e. medicinal herb. They would discuss in their household about medicinal herbs and collected these medicinal herbs to cure household members who were sick. If they were not getting well, they would go to other people outside their household or relatives then later to health care centers, and hospitals. In this village, there were many people who were related to health care, namely:

Traditional doctor

Traditional doctor was a person who knew medicinal herbs and used them to cure or reduce illness symptoms for people in their household and other households in this village for a long time. Thus, there were medicinal herbs planted around all Hmong houses. When a villager ordered some medicinal herbs from the traditional doctor, he would pay for these medicinal herbs if he was not their relatives and friends. The traditional doctor would learn about how to use medicinal plants from their teachers or descendants from their ancestors. Before they went to collect medicinal plants, they needed allowance from medicinal spirits.

Spiritual man

Spiritual man or “Neng” who had important roles to cure people’s illness and they believed that it was caused by spirits or ghosts. When symptoms of illness were not clear and illness could not be cured by using of modern medicines. Villagers would see the spiritual man (Neng) and the spiritual man (Neng) did worship to apologize spirits or ghosts.

Medicinal plants that were used in the Hmong households could be divided into two groups, firstly, medicinal plants which were planted in home gardens and fields, and secondly, wild medicinal plants. The planting of medicinal plants originated from their ancestors and the plants were used in the household for treatment of common illness such as cold, fever, and stomachache.

Wild medicinal plants were medicinal plants that grew in the forests and people collected them for medicines. A few numbers of medicinal plants were brought from the forests and planted in home gardens, medicinal herb plots, and cropped fields. Traditional doctor must know and remember locations of medicinal plants in the forest.

For medicinal plant utilization, Hmong people had knowledge of plant utilization both wild and propagated in their household. Medicinal plant species that were used in Hmong households could be divided into three groups, namely medicinal plants for common diseases, health nourishing, and for pregnant women. Most plants were used for reducing common illnesses such as cough, fever, headaches, and damaged skin.

In this interview, women described specifically the ways to treat the diseases by using these plants. The female villagers interviewed said that they learned these practices and experiences from their mothers and old people in their family. The number of wild plant species gathered and used by women was more than the number known and used by men. Male villagers said that they were not often used medicinal plants but they knew about how to use these plants because they knew medicinal plants from their mothers and saw their wives used them.

Women knew medicinal plant species that used as medicine for common illness and mixed some medicinal plants in food meals. They knew wild plant species and how to use them. Example of utilization medicinal plants as ingredients in food meals including fried *Eurysolen gracilis Prain* with eggs to nourish women after pregnant and boiled *Oxalis corniculata L.* or *Eurysolen gracilis Prain* with chicken for reduced cough. Details and pattern of uses of medicinal plants for reduced common illness by women was shown in Table 32.

Table 32 Medicinal plants species and uses in Hmong household

Medicinal plants species	Pattern of uses	Common illness
Food - Medicine		
<i>Eurysolen gracilis</i> Prain	Fried with eggs	Nourishing: pregnant women
<i>Oxalis corniculata</i> L	Boiled with chicken	Cough
<i>Lindernia antipoda</i> (L.) Aist.	Boiled with chicken	Fever
<i>Centella asiatica</i> (L.) Urb.	Boiled with chicken	Nourishing: Except children and pregnant women
<i>Adiantum philippense</i> L.	Boiled leaves and then drink	Nourishing: Old people
Medicine		
<i>Pteris cretica</i> L.	Boiled roots and then drink	Fever
<i>Peliosanthes teta</i> Andr. ssp. humilis (Andr.) Jess	Boiled roots and then drink	Cough
<i>Pavetta fruticosa</i> Craib	Boiled leaves and then drink	Nourishing : Heart disease
<i>Adiantum philippense</i> L.	Boiled leaves and then drink	Nourishing : Old people
<i>Conyza samatrensis</i> (Retz.) Walk.		
<i>Chloranthus erectus</i> (B.H.) Verd.	Boiled roots and then drink	Nourishing: pregnant women
<i>Maclura fruticosa</i> (Roxb.) Con.	Squeeze leaves and put on damaged skin	Insect poisoning
<i>Camellia taliensis</i> (W.W. Sm.) Mel.	Squeeze leaves and put on damaged skin	Sore, wound, and damaged skin from knife or bruised skin
<i>Leea indica</i> (Burm.f.) Merr.		
<i>Maesa permollis</i> Kurz		

Source : Survey, 2002

6.3. Pattern of wild plant utilization

Wild plants were collected depending on objectives in utilization of collectors. It affected the pattern of use in each purpose. There were many parts of wild plants that were used such as using stem of wild banana, roots of taro, shoots of wild bamboo, and leaves or baby leaves of pak wan pah for food. The detail of wild plant collection in Huay Hoi village was present in Table 33.

Food plants, many parts of these plants were used as food including young leaves, stems, roots, shoots, flowers, and fruits were collected in household consumption. Normally, these plant parts were consumed as fresh and processed food. The processing were normally used in the households including boiling, frying, grilling, and steaming.

Medicinal plants were collected depending on the use and they were used for medicinal purposes. Popular parts of plants were leaves and whole plants for common illnesses and were used by boiling them in water and then drinking boiled water. For some plants, stems, flowers, and fruits as some ingredients of food such as boiling these plant parts with chicken as food and medicine.

For fodder collection, whole plants were used as fodder. The collected plants collected fodder would be found around field crops and nearby water sources. The popular plants was stem of banana which was used in every household. Villagers would boil banana stem with mixed vegetable for their pigs before feeding them.

As for fuelwood in the household, most households used dried wood stick for fuel that were collected from the forests or around crop fields. Women would collect only dried branches in their baskets and then bring these branches home. While men would cut dried trees from nearby forests with truck and then this fuelwood would be kept near their house.

Table 33 The pattern of wild plant collection in different utilization purposes, Huay Hoi village

Utilization purposes	Part of use	Pattern of use
Food	Leaves, Baby	-Boiled
	leaves, Shoots,	-Boiled with meat
	Roots, Seeds,	-Fried with mixed green and grilled
	Fruits, and Flowers	-Steam
Medicinal plants	Leaves, Baby	-Boiled and then drink only water
	leaves, Roots, and	-Boiled with meat
	Fruits	-Squash leaves and then put on problem ares
Fodder	Leaves, Baby	-Boiled with mixed vagatables
	leaves, Roots, and	
	Fruits	
Fuelwood	Stems, and branches	-Cut and then stored at home

Source : Survey, 2002

6.4. Sources of wild plant collection

On this study, it was found that the Hmong went to gather wild plants from many places in the forests and around their fields but in this study, the focus was on the main places where they went. The main locations were not far from their village and crop fields. Almost of wild plants was near village, crop fields, and streams especially food plants. For wild plant collection, they went to gather these wild plants around their field plots and if they enough time after field work, they would collect wild food plants from community forest that far from Huay Hoi village about 4

kilometer. The villagers states that Mae Sa Nga forest was the best places for collect food but they were not often to gather / collect wild plants because this forest was about 12 kilometers far from the village. Medicinal plant collection was collect at the community forest of Huay Hoi village where located in the north of this village. The nearby forest at Huay Nam Chang village was a forest that villagers collected medicinal plants (Figure 6).

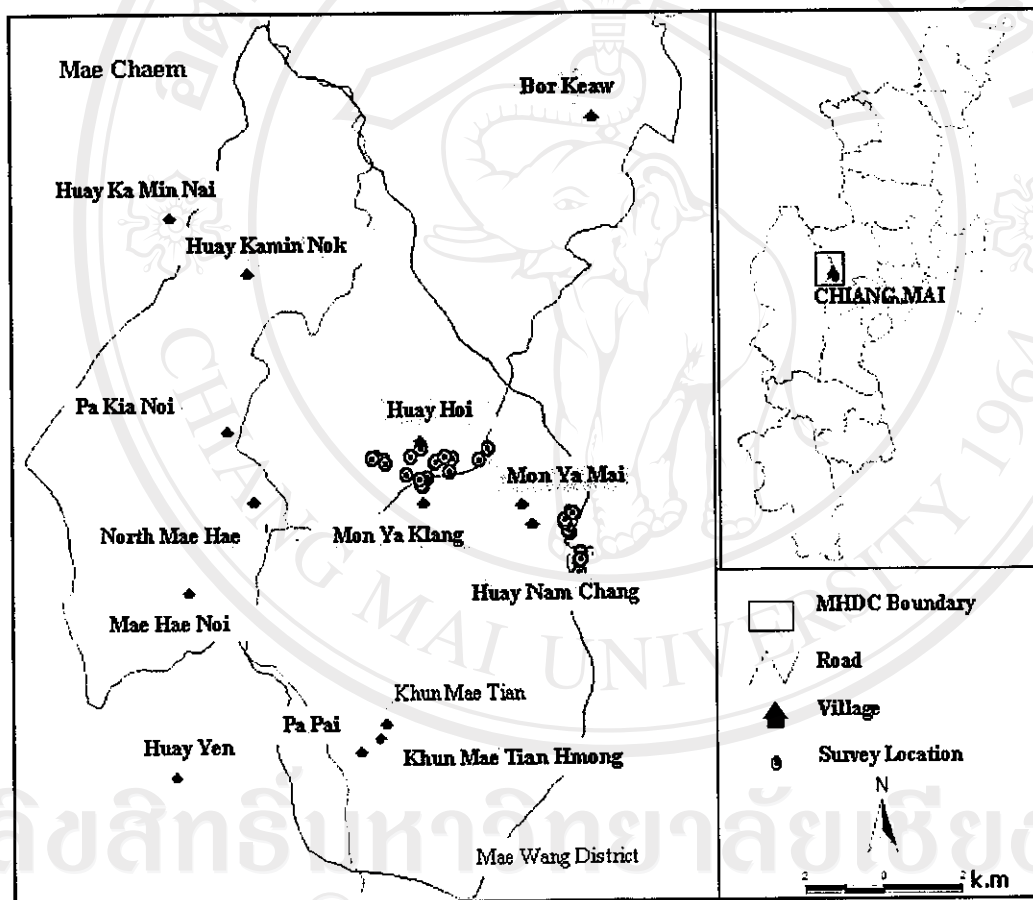


Figure 6 The location where villagers collected wild plants

6.5. Wild plant utilization's knowledge transfer

According to the growth of medical science, there was a decrease of the use of wild plants for medicinal purposes. Villagers would popularly use services from hospitals, other medical care centers and drug stores because it was comfortable and save their time. In addition, most villagers spent their time for growing cash crops more than other activities especially among the new generation. They were less interested in wild plant utilization. Thus, the use of wild plants for medicine was limited only in the old villagers.

In Huay Hoi village, local knowledge was acquired and transferred both as knowledge and as practical skills. It was a tradition that the traditional family treatments, which were handed down from generation to generation within a family, would be transferred to daughters, sons, and daughters – in – law. While women would know about medicinal plants to cure certain types of diseases including the diseases that are only treated by traditional family medicine. The men's knowledge of using medicinal plants was limited to using the plants for traditional family treatment transferred by their parents. Even though they knew about using and species of those plants but the real practitioners of medicinal plants are their wives. Thus, men played their role as someone who would transfer this knowledge from their parents to their wife.

Knowledge on wild food plants would be transferred in the household through discussions among family members while they prepared food and during meal times. Girls would know about wild food plant utilization from their mothers because they must help their mothers to prepare food for family members and their animals. When the girls went to collect wild plants for food together with their mothers, they were taught about species and uses of collected wild food plants. After they went back home, they would prepare food and discuss about types of food that they wanted to

process. At the same time, the households that had old people would know about wild plant utilization for food and learn about the utilization of wild plants from them. In addition, the discussion among neighbors and friends was used as a way to learn about uses of wild plants because women often collected wild plants with their friends and neighbors besides going to collect wild food with their family members.

Knowledge on medicinal plants in Hmong communities was not limited only to traditional doctors, but at least one people in all Hmong households would know about 4-5 herbs and wild medicinal plant species. Especially the group of older women (more than 45 years old), they would talk and exchange knowledge of wild plant or herb utilization. When family members were sick, they would ask their relatives, friends, and neighbors about species of medicinal plants and pattern of uses to apply illness symptoms. Women would have skills in medicinal plant utilization for pregnant women because most midwives were women. While men would have skills in medicinal plant utilization for treatment of bone and muscle symptoms, but pharmacopeias of Hmong were a secret of each traditional doctor. There were many types of medicinal plant species that were used in treatment for each disease.

Knowledge of medicinal plant utilization would be passed on to their children, relatives, and people who the traditional doctor trusted respectively depend on their situations. If people learned medicinal plant utilization from the traditional doctor and they used that knowledge to hurt other people, the doctor would be punished from medicine spirits. Thus, if they were not sure about people who inherited medicinal plants knowledge, they would not pass on their knowledge to their children or relatives. People who inherited medicinal plant knowledge must build a shelf to be used for apologizing to medicine spirits.

The process of knowledge transfer of medicinal plant utilization from traditional doctors would start within their household first. They allowed their children to follow them to collect medicinal plants around their houses, villages, and

fields. After that, children would be allowed to follow them to collect wild medicinal plants in the forests. Most daughters would learn this knowledge from their mothers while sons would learn from their fathers who were traditional doctor. Sometime, sons would follow their mothers to collect wild medicinal plants while daughters would not collect wild medicinal plants with their fathers. When the mothers or fathers died, daughters or sons would inherit the knowledge of medicinal plant utilization.

The knowledge of medicinal plant utilization could be transferred by learning from their ancestors with the transfer process being within in their households and relatives before it happened among from friends and traditional doctors. Learning among friends often took place in discussions in women's and men's groups. When women did needlework while men discussed among themselves after dinner, they would discuss about their livelihood and medicinal plant utilization, especially when there were ill people in their households. Learning from traditional doctors, villagers would pay some money for learning about medicinal plant utilization but amount of money that was paid for traditional doctor would depend on their relationships. If they were closely related, no payment was necessary.

In the case of Mrs. and Mr. Fua who were experts about medicinal plants, they said that, when they were young, they learnt knowledge about medicinal plants from his mother and he often went to collect medicinal plants with her. In the present time, when Mr. Fua went to collecting of medicinal plants with his daughter and sons, he often asked them about the uses and species of plants. Now, he could not go to collect medicinal plants in the forests where it was very far, he would tell their daughters and sons to collect medicinal plants for him. Normally, his daughter would accompany him because his sons were not much interested in medicinal plants. At present, there were other ways to transfer knowledge of medicinal plants, which are transferred from an expert from other Hmong village.

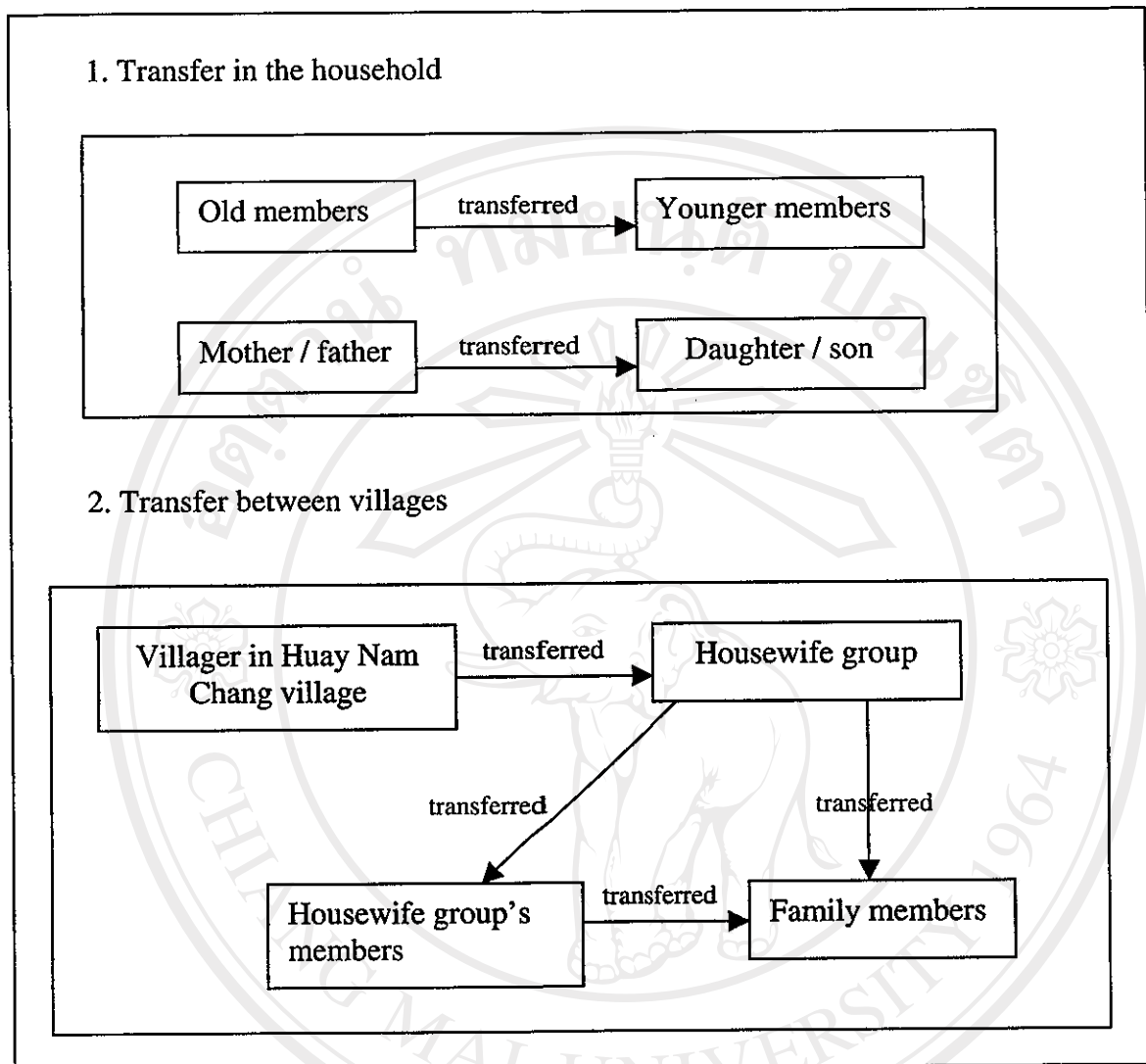


Figure 7: Transferring of wild plant utilization's knowledge of Huay Hoi village.

This figure shows that there were two ways for transferring knowledge of wild plant utilization (Figure 7). In Huay Hoi village, knowledge about wild plant utilization would be transferred in their family. Mother would teach their children or the family members who had knowledge would teach other family members especially old persons would teach younger persons. Old villagers transferred their knowledge to their family members i.e. sons and daughters.

In addition, there was other ways to learn about wild plant utilization from other persons from a nearby village “ Huay Nam Chang village”. Huay Hoi's

housewives' group learned about local herbal plants and pattern of utilization of these plants from both home gardens and forests. The knowledge was transferred from person to person but there were no records of this knowledge. This point is a reason to the disappearing of wild plant utilization knowledge.

6.6. Economic valuation of wild plants

Wollenberg and Naiwir (1998) mentioned that the estimated incomes of people whose livelihood depend on forests were key to understanding their well – being and uses of forests. The possible techniques for valuing non-timber forest products using market price, direct and indirect substitutes, barter exchange, and opportunity cost of labor approached (Bann, 1998)

This study showed the economic valuation of wild plants that were gathered and collected by Hmong women and men in Huay Hoi village. The economic evaluation of forest resource could be made by using direct and indirect method. For the forest product valuation in this study, the available products in the market can be evaluated by obtaining market price of the products or market price of substitute products.

Product price and economic value

Wild plants price in the upland areas differed according to the distance from the central markets in the city. The main reasons of differences were the distance, transportation, quality of product, and product concentration. Some wild plants had not sold in the town market, it was sold only in upland areas. In Huay Hoi village, there were many wild herbs that had not sold in any market, such as wild herbs for pregnant women (*Dalbergia oliveri* Gamb. ex Prain).

Wild plants and other non - wood forest products used by local people were also basically source of food. In Huay Hoi village, the local people used those wild plants and other non - wood forest products for household uses. Sometimes they earned some money from them even though being small amounts of money. Wild plants and other non - wood forest products were extracted for sale including medicinal plants as the main products for sale, bamboo shoot, and fuel wood. The collected of wild plants and other non - wood forest products were sold depending on the local and outside people demanding them and sometimes they demanded the products before the local went to collect them.

Table 34 shows that economic value of popular wild plants and other non - wood forest products, which were gathered from the forest. This value of wild plants could be estimated by using available market price and quantities of use in one year. This study showed only value of wild plants that could be estimated in term of uses and their market prices. Price of food plants which were used as food in the household were between 5 – 15 baht per kilogram and value of these wild food plants include 810, 520, and 180 baht per year of *Dilphazium esculentum* Sw., *Bambusa arundinacea* Wild, and *Amorphophallus companulatus* Blume respectively. While prices of medicinal plants were higher than price of food plants, amount of use of medicinal plants were lower because they were used in very small amounts per year. Medicinal plants, which used to treat pregnant women, are expensive such as *Curculigo capitulata* (Lour) O.K. and *Dalbergia oliveri* Gamb. ex Prain include 120 and 80 baht per kilogram. For fuelwood collection, the estimated value of use was about 900 baht per year per household. They collected fuelwood from the forest and transferred by truck.

Table 34. Market price and value of wild plants in Huay Hoi village

Scientific name	Price (Baht / Units)	Used quantities (unit/year)	Value (Baht / year)
Food plants			
<i>Oroxy indicum</i> Vent	3 – 5 baht/pod	13 – 15	39 - 75
<i>Melientha suavis</i> SW.	15 baht/kilogram	7.5	112.5
<i>Amaranthus viridis</i> Linn	3 – 5 baht/kilogram	18.3	54.9 – 91.5
<i>Irvingia malayana</i> Oilv.ex A. Benn.	25 baht/kilogram	8.4	210
<i>Carex baccans</i> Nees	5 baht/kilogram	13.5	85.5
<i>Galinsoga parviflora</i> Cav.	3 – 5 baht/kilogram	19	57 – 94
<i>Russula sanguinea</i>	30 baht/kilogram	14.5	435
<i>Termitomyces fuliginosus</i> Heim	28 baht/kilogram	14.8	414.4
<i>Lentinellus praerigidus</i> Berk	30 baht/kilogram	11.5	335
<i>Bambusa arundinacea</i> Wild	10 baht /kilogram*	52	520
<i>Musa sapientum</i> Linn	2 baht / hand*	60	120
<i>Amorphophallus companulatus</i> Blume	5 baht / kilogram*	24	180
<i>Dilphazium esculentum</i> Sw.	15 baht / kilogram*	74	810
<i>Solanum torvum</i> Sw.	11 baht / kilogram*	10	110
<i>Lablab purpureus</i> (L) Sw	5 – 10 baht/kilogram	17.6	88 – 176
Medicinal plants			
<i>Curculigo capitulata</i> (Lour) O.K.	120 baht / kilogram*	2	60
<i>Sterculia lanceolata</i> Cav. var. Lanceolata	20 baht / kilogram*	2	40
<i>Achyranthus aspera</i> L.	30 baht / kilogram*	3	45
<i>Oxalis cornicalata</i> L.	30 baht / kilogram*	3	90
<i>Dalbergia oliveri</i> Gamb. ex Prain	80 baht / kilogram*	1	80

Table (Continue)

Scientific name	Price (Baht / Units)	Used quantities (unit/year)	Value (Baht / year)
Fuelwood			
Mixed of dried timber plants	300 baht / pick up truck*	3	900

Source : survey, 2002

Note : * as price at Huay Hoi village

This study covers only species, quantities, pattern of use, and the economic values of wild plants as food, medicine, fodder, and fuel wood that were used by Hmong people especially women. In addition, this study described knowledge transfer of wild plant utilization on this area.