

**PEMANFAATAN GAMBIR (*Uncaria gambir*) SEBAGAI  
OBAT TRADISIONAL ETNIS PAKPAK DI KABUPATEN  
PAKPAK BARAT, SUMATERA UTARA**

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## ABSTRACT

*Gambir is one of the annual plants that produce sap which is widely used for industrial and pharmaceutical purposes. Gambir is known by the public as an additional ingredient in chewing that can strengthen teeth and gums. Gambir is one of the products on the gambier plant which has been used by the Pakpak ethnic group for traditional medicine. This study aims to determine the benefits of gambier and its use by the Pakpak Ethnic community in West Pakpak Regency, North Sumatra. The method used in this study is a qualitative descriptive method through an emic and ethical approach with data collection techniques using semi-structural interview techniques based on a list of questions regarding the benefits of gambier and its use by the Pakpak ethnic community. The results showed that the benefits of gambier are as a treatment, which is categorized as the treatment of minor illnesses and serious illnesses, 14 types of minor illnesses that can be treated and 5 types of severe diseases that can be treated, and other benefits of gambir being used as a treatment that used by all ethnic pakpaks. As for the use of gambier, namely as treatment and care, the use of gambier as treatment is greater, namely 76% of treatment compared to 24% of treatment. The most widely used way of using gambier is by drinking it. Gambir has the main compound, namely catechins, which are used in treating diseases.*

**Keywords:** Utilization; Gambir; Traditional Medicine.

## CHAPTER I

### INTRODUCTION

#### 1.1. The Background of the Study

Indonesia is a tropical country that is rich in natural resources, and has more than a thousand medicinal plants. Utilization of natural resources in the form of medicinal plants as traditional medicine to cure various diseases has been done since thousands of years ago. Currently, the use of medicinal plants (herbal medicine) is increasing. Several herbal medicines have been proven to be effective in curing various diseases and can be used as alternative medicines, one of which is anti-diabetes (Kumar et al. 2011).

Traditional medicine is still used by the community and until now many have been scientifically proven to have medicinal properties. The types of medicinal plants are not known with certainty, so it is necessary to thoroughly document the use of plants as raw materials for treatment. Supported by Zuhud's research (2011) that the use of plants as medicinal ingredients has long been carried out by people in Indonesia.

With the ethnic diversity that exists, the use as medicine is also increasingly diverse. Changing people's awareness, mindset and lifestyle requires socialization. The success of socialization can increase public interest in using traditional medicine. This is because people feel that traditional medicine comes from natural ingredients which are cheaper and the raw materials are easier to obtain (Nursiyah, 2013). In addition, local wisdom in certain communities allows the use of traditional medicines (Situmorang & Harianja, 2014). People switch to traditional medicines because they are cheaper, materials are easier to obtain when grown alone, and generally one plant has more than one pharmacological effect so that it is useful for treating disease (Katno, 2009).

Effendi's research (2013) also shows that there are benefits of traditional medicine by the community for treatment and health therapy. According to (Rahmawati et al., 2012) the factors behind people using the traditional medical services provided, because the medicine comes from herbs and natural treatment techniques, so the side effects are small and the cost of treatment is cheaper than modern medicine. The effect of traditional medicine that is felt by the community is that the disease suffered is cured and is compatible with the medicine given by traditional medicine.

*Gambir* (*Uncaria gambir*) is an annual plant that produces sap which is widely used for industrial and pharmaceutical purposes. It is a plant that grows in tropical areas and is used as an antidiarrheal and astringent in Asia (Anggraini et al. 2011). It is known by the public as an additional ingredient in betel nut that can strengthen teeth and gums, one of the ingredients for traditional purposes, diarrhea medicine, ulcer medicine or stomach acid. Modern *Gambir* is widely used as a pharmaceutical ingredient such as drugs, adhesives, batik materials, and a mixture of beer solutions. *Gambir* is also used in leather tanning or fishing nets, Fauja (2011).

The Batak ethnicity is one of the indigenous ethnic groups on the island of Sumatra, most of whom live in North Sumatra. The Batak ethnic group consists of 5 sub-ethnics namely Karo, Pakpak, Simalungun, Toba, and Angkola/Mandailing (Bangun, 2010). The Pakpak Batak sub-ethnic is a Batak sub-ethnic with the main areas in West Pakpak Regency and Dairi Regency, North Sumatra (Bangun, 2010), which until now still use plants in medicine.

West Pakpak Regency consists of 8 sub-districts and consists of 52 villages with an area of 1,218.30 km<sup>2</sup> and a population of around 48,119 people (2018) with a population density of 42 people/km. West Pakpak is located at the foot of the Bukit Barisan Mountains.

Economic activities are focused on agriculture and plantations. West Pakpak Regency is the

largest producer of gambier in North Sumatra Province after Dairi, Deli Serdang, Central Tapanuli and Mandailing Regencies. With an area of 1,051 ha of gambier plants, and its productivity reaches 12,789 kg/ha/year (Central Bureau of Statistics of West Pakpak Regency, 2012).

The Pakpak ethnicity is a sub-ethnic with the main areas of West Pakpak Regency and Dairi Regency, North Sumatra, with community activities who work as farmers. Plants that are managed and planted are not only used to meet basic food needs such as vegetables, rice, and fruits but also many farmers in the West Pakpak area use plants as medicine to treat diseases traditionally (Bangun, 2010). One of the plants that has been used from the past until now by the Pakpak Ethnic as a traditional medicinal plant is *Gambir*.

Based on this, it is known that the use of *Gambir* is very large, especially for the health sector or as traditional medicine in the Pakpak ethnic group. However, knowledge about the benefits of *Gambir* is not yet known by the general public. So it is necessary to have data as information and local knowledge about the traditional use of *Gambir* in the Pakpak Ethnic, West Pakpak Regency.

## 1.2. The Problems of the Study

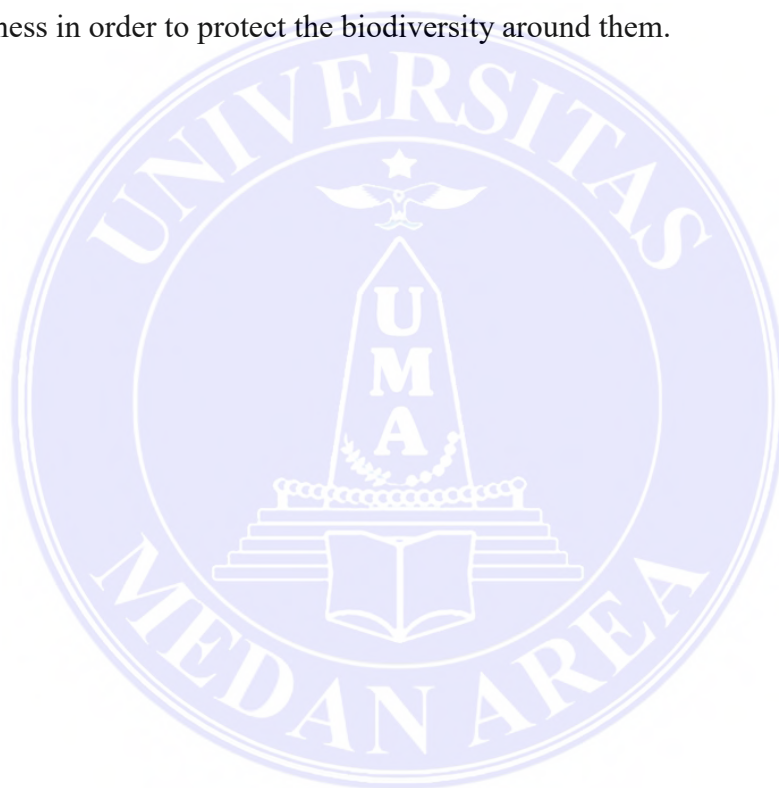
From the background above, the problem of the study in this research is what are the benefits of *Gambir* and how is it used by the Pakpak Ethnic community in West Pakpak Regency, North Sumatra?

### 1.3. The Objectives of the Study

The objective of this study was to determine the benefits of *Gambir* and the use of *Gambir* by the Pakpak Ethnic community in West Pakpak Regency, North Sumatra.

### 1.4. The Significances of the Study

The significances of this study are as information and data for researchers, local communities, parties in need and as literature for further researchers, as well as to increase public awareness in order to protect the biodiversity around them.



## CHAPTER II

### LITERATURE REVIEW

#### 2.1. The Description of *Gambir*

*Gambir* plants are included in the Kopi-kopian tribe, originating from twisted shrubs and have hard stems, 1-3 cm high, upright stems, round, simpodial branching, pale brown, single leaf, opposite, elliptical shape, jagged edges, round base, tapered tip, 8-13 cm long, 4-7 cm wide, green, compound flowers, bell shape, armpit leaves, fruit ovoid, about 1.5 cm long, black (Haryanto, 2009).

*Gambir* plants can be harvested at the age of 1.5 years, the next harvest is done after 5 or 6 months depending on the condition of the plant (Pakpak Bharat Agriculture Office, 2007), *Gambir* can be harvested 2-3 times a year. The characteristics of *Gambir* plants that are ready to be harvested are that each twig is no longer sprouting, brownish green, stiff and hard, the leaves have reached the marang stage, dark green, brownish yellow, thick leaf sheets, hardened and stiff, when squeezed they release sap, the age is more than 5 months from the previous harvest season. The part of *Gambir* plant that is harvested is the leaves. So what needs to be considered is the level of leaf development, the first time you need to know is the age of the plant after planting, which is 1-2 years. The next harvest does not have certain criteria, usually only look at the number of leaves with leaf ages ranging from 4-6 months after the previous harvest (West Pakpak Agriculture Office, 2007).

*Gambir* is an industrial plant that has high economic value and good prospects for farmers and suppliers from foreign countries. Along with the development of research, *Gambir* can be widely used in the pharmaceutical, cosmetic, food, textile and ink industries (Muchtar et al. 2014).

*Gambir* (*Uncaria gambir*) is a plant belonging to the Rubiaceae family. It is a kind of dried sap derived from crushed extracts of leaves and twigs of plants that have various benefits for the community, besides that the leaves on *Gambir* can also be used for health, namely in the form of tea to be brewed, all of which are used as traditional medicine. This *Gambir* plant, is used to treat various types of diseases such as diarrhea, toothache, and so on with different ways of using it as well as for health, which can be consumed every day. This plant comes from the Southeast Asian region, especially Indonesia and Malaysia. In Indonesia, *Gambir* was a trading commodity in the early 19th century in Europe, which at that time was the golden era of *Gambir*. But after World War II, the gambier trade declined. *Gambir* became unimportant in international trade. This condition made *Gambir* plantations go bankrupt, and the gambier plantation areas were replaced by other crops. Currently, Indonesia is re-developing gambier production because Indonesia is the main producer of *Gambir* in the world (Fauza, 2011).

## 2.2. The Classification of *Gambir*

*Gambir* comes from Southeast Asia, especially the island of Sumatra, and is widely cultivated in West Sumatra. This plant lives in open areas in the forest, moist forest areas, open areas free of cultivation or forest edges at an altitude of 200-900 meters above sea level (Sampurno et al. 2007)



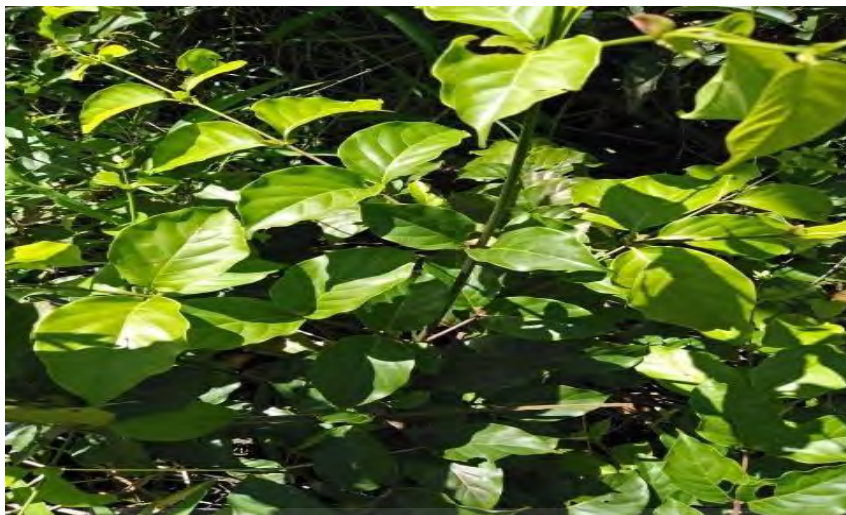


Figure 1. Gambir Plant, (Source: Personal Documentation, 2021)

The systematics of *Gambir* Plant (*Uncaria gambir*) in Haryanto (2009) are: Division (Spermatophyta), Subdivision (Angiospermae), Class (Dicotyledon), Nation (Rubiales), Tribe (Rubiaceae), genus (*Uncaria*), and Species (*Uncaria gambir*).

### 2.3. The Benefits of *Gambir*

*Gambir* in Indonesia is generally used for betel nut, besides that it is also used to treat various diseases such as burns, headaches, diarrhea, dysentery, canker sores, mouthwash for sore throats, skin diseases, skin tanning, etc. According to Anggraini et al. (2013) *Gambir* can be used as an anti-acne gel formulation which is processed from *Gambir* ethyl acetate extract.

*Gambir* has many benefits, including as an ingredient for betel, as a medicine for burns, diarrhea, dysentery, canker sores, to treat acne or diseases of the face. Antioxidant and antibacterial activity of methyl derivatives of ethanol extract of *Gambir* leaves as an oral antiseptic, inhibitor of fatty acid synthesis, toxic effects of *Gambir* on the kidneys, liver, and heart. In addition to the activity test of *Gambir* extract, a catechin activity test has been

carried out, which functions as an antimicrobial, antispasmodic, for use as a cosmetic that has been tested for antiaging, anti-acne, and for weight loss (Febriana, 2006).

#### **2.4. The Chemical Compound Content of *Gambir***

*Gambir* contains polyphenolic compounds found in *Gambir* extract. These polyphenolic compounds are catechins that act as antimicrobial and antioxidant compounds. This *Gambir* has been widely used as medicine, ink, and dye, but gambier processing is still not optimal due to the lack of public knowledge in gambier extraction (Achmad et al. 2012). The antioxidant compounds in *Gambir* have the potential as antidiabetic which can prevent the oxidation of glucose in the blood. (Trina et al. 2014) stated that plants rich in tannins have good antioxidant and diabetes activity.

*Gambir* has many pharmacological activities, namely antioxidant, antimicrobial, anthelmintic, anticariogenic, xanthine oxidase inhibitor, antilipid, and antidiabetic shown by its alpha-glucosidase inhibitory activity and hypoglycemic activity. *Gambir*'s pharmacological activity was obtained from in vitro and in vivo tests. The content of compounds that affect the pharmacological activity of gambier are catechins, polyphenols, quinic acid, quercetin, and prenyl resorcinol derivatives. To determine the content of compounds in *Gambir*, phytochemical screening was carried out, and to determine the amount of compound content, quantitative determination was carried out such as total phenolic values, total sugars, tannins, catechins. According to research, about 76% of gambier contains catechins and polyphenolic compounds (Andasuryani, et al., 2013). Catechins are the main bioactive compounds found in gambier (Anggraini, et al., 2011). Catechin compounds are the main flavonoids in gambier, while epicatechin and caffeic acid are flavonoids with low levels in gambier. This group of flavonoids has been shown to have antioxidant activity (Ningsih, et al., 2014).

The quality of *Gambir* is determined by the levels of catechins. According to the Indonesian National Standard (SNI 01-3391-1994). For quality I with characteristics: maximum water content of 17%, maximum ash content of 7%, maximum alcohol insoluble material 12% and minimum catechin content of 40%. The content and chemical composition of *Gambir* extract can be seen in the table below.

Table 1. Content and Chemical Composition of *Gambir* Extract

No.	Chemical components	Percentage (%)
1.	Catechins	7-33
2.	Kathechu tannic acid	20-55
3.	Pyrocatechol	20-30
4.	Gambier fluorescent	1-3
5.	Red Katechu	3-5
6.	Quercetin	2-4
7.	Fixed oil	1-2
8.	Candle	1-2

Source : Isnawati, 2010

## 2.5. The Distribution of *Gambir*

*Gambir* extract is a dry extract from the twigs and leaves of the *Gambir* plant (*Uncaria gambir*) (Kasim, 2011).



Figure 2. *Gambir*, Source: Nova Bancin Documentation

*Gambir* is one of the export-oriented smallholder plantation commodities. It is the result of hot water extraction from the leaves and twigs of the *Gambir* plant (*Uncaria gambir*) which is then deposited, drained, printed and dried. The extraction process is carried out by development, both traditionally and using hydraulic presses (Kasim, 2011).

The parts of the *Gambir* plant that are used by the community in West Pakpak Regency are old leaves and young twigs. *Gambir* processing is still processed traditionally. Respondents' understanding of *Gambir* processing is obtained from the experience of their parents for generations and has been preserved.

The *Gambir* processing process in the research area still uses tools and materials that are simple and easy to obtain, such as gambit/sanggi swings, gloves, scissors, buckets, sieves, dippers, cormorants, and so on.

According to Heyne (1987) in Fauza (2011) there are several stages of the process of making gambier, namely as follows:

- The initial stage in *Gambir* processing is picking, namely selecting old *Gambir* leaves with red-spotted leaves and 4 months of age after the first one year old leaves are trimmed.
- The second stage is boiling *Gambir* leaves, which is done through two stages of boiling with a long boiling time for each stage between 30 minutes to 60 minutes. In the first stage, wet or fresh *Gambir* leaves are boiled using clean water. This first boiling causes the amount of water in the pot to decrease. Next, new water is added to the pot, until the time limit for the first boiling and the boiling process starts again (second stage).
- After the second stage of boiling, the leaves are removed and drained, then pressed with a simple felt. The pressed leaves are discarded and the liquid sap that comes out of the press is accommodated and put back into the pot containing boiled water. Then the boiled water is cooled until a perfect precipitate is formed.
- The third stage of the process is storing the leaves, the boiled *Gambir* leaves are put into a sack, then placed between two pieces of wood. The two woods are joined together using an iron with one end in the form of a hook. The other end is a thread that functions as a lock by turning the screw located on the bottom wood. Thus the wood at the top will press the leaf in line with the rotation of the locking screw. This process takes about 1 hour.
- The fourth stage is the deposition of *Gambir* leaves, the liquid sap from the first stage and second stage boiling process is filtered and transferred to a depositional container (stepping), so that the deposition takes place perfectly, plus fishing material. This fishing material is made from the first stage of boiled *Gambir* eaves (100 to 200 g) plus boiled water (1 liter), then kneaded so that white *Gambir* sap comes out, then the liquid is filtered. The filtered liquid is put into each settling container which has

been filled with *Gambir* sap evenly. The deposition process lasted for 12 hours and then the sediment was drained.

- The fifth stage is draining, is done by inserting the *Gambir* sediment into a burlap sack, then the sack is hung. Then the draining time for 16 hours. The purpose of draining is to separate water or remove water from the sap.
- The sixth stage is printing, using coconut shells with a diameter ranging from 9 to 12 cm and a thickness of 2 to 3 cm. The gambier deposit is inserted into the mold, then placed on the printing base in a prone position (top facing down). Printing is done on flat ground and coated with burning ash, then on top of the burning ash covered with cloth, with the aim that the liquid that is still there goes into the burning ashes.
- The seventh stage is drying, the printed *Gambir* is arranged on a drying rack made of woven bamboo, then dried or placed in a drying area exposed to direct sunlight.
- The eighth stage is flotation or milling.
- The ninth stage is packaging.

Determination of the quality of *Gambir* is done visually by paying attention to the color, shape of the print and the weight of *Gambir*. This method is done by pounding or by thawing the frozen gambier. The method of testing mentioned above is based on the expertise and experience of the examiner. However, the results of such an examination are subjective (Nazir, 2000).

As for the processing of *Gambir* tea, namely picking old *Gambir* leaves, then soaking *Gambir* leaves for 4 hours, after that the drying process until the leaves are completely dry, then the process of grinding *Gambir* leaves or *Gambir* leaves which are ground using a flouring machine after that enter the *Gambir* tea in packaging or sachets.

## 2.6. The Utilization of Medicinal Plants

### 2.6.1. Treatment

Traditional medicine is herbs from various plants that are efficacious and have various development concepts according to their respective cultures. The use of traditional medicine has been going on for a long time and was developed long before modern medicine was discovered and marketed. Knowledge of traditional medicine is a hereditary inheritance from our ancestors, traditional medicinal plants are often used for the treatment of various diseases (Apriliana et al. 2016). Knowledge and skills that have been passed down by previous generations, including the current generation, (Sari et al. 2015). Each region or ethnic group has its own characteristics in terms of traditional medicine.

The Minister of Health of Indonesian Republic No. 1076/Menkes/SK/VII/2003 regarding the implementation of traditional medicine decided that:

1. Traditional medicine is treatment or treatment by means of medicine and its treatment which refers to experience, hereditary skills, or education and training, and is applied in accordance with the prevailing norms in society.
2. Traditional medicine is an ingredient or herbs in the form of plant material, animal material, mineral material, preparation of extracts (galenic) or a mixture of these materials which have been used for generations for treatment based on experience.
3. Traditional medicine is a person who performs traditional (alternative) medicine.
4. Foreign traditional medicine is traditional medicine for foreign nationals who have a limited stay visa or limited stay permit or permanent residence permit for the purpose of working in the territory of Indonesian Republic.

5. Traditional medicine registered letter, hereinafter referred to as STPT, is written evidence given to traditional healers who have registered.
6. Traditional medicine license (SIPT) is written evidence given to traditional medicine whose methods have been studied, researched, and tested proven to be safe and beneficial for health.
7. Traditional medicine shop is a place to store, serve, and sell traditional medicines.

### **2.6.2. Health**

Health is one of the basic needs for the sustainability of human life in addition to other needs such as food, shelter and education, because only in a healthy state humans can live, grow and develop, work and apply ideas they have well. To obtain optimal health, the community recognizes two types of treatment, namely, modern (medical) medicine and alternative or traditional medicine. Medical treatment is one type of treatment that uses modern tools, methods, and materials made from chemicals which are included in the standard of modern medical treatment. While alternative medicine is a health effort that is rooted in tradition and uses natural ingredients whose treatment system is very different from the treatment system in the field of medical science (Wakidi, 2013). The manifestation of great concern for health is seen from the daily life of people who behave in a healthy manner, starting from a clean environment, a clean way of life and adequate and nutritious food.

### **2.7. *Gambir* plantation in West Pakpak**

The agricultural sector has a strategic role in the economic structure of West Pakpak Regency which can be seen in the GRDP contribution of 73.7%, with the involvement of the labor force in agriculture on a household scale of 88.35% (Pakpak Bharat in Figures, 213). Thus, the agricultural sector is the main priority in regional development in West Pakpak Regency, especially for the food crops sub-sector, plantations are the food crops sub-sector



to the added value of the agricultural sector. in 2012, the plantation sector had a share of 25.13% of the agricultural sector.

One of the leading and mainstay commodities from the plantation sector in West Pakpak Regency is *Gambir* plant (*Uncaria gambir* Roxb), with an area of 1,224 ha of *Gambir* plants, the production of *Gambir* is 1,453.40 (Pakpak Barat in Figures, 2013). *Gambir* has long been known as a mixture of betel food ingredients that can be used as ingredients for medicinal herbs, and other industrial parts. Although the benefits of *Gambir* are many, attention to the development of this plant is still lacking. This can be seen from the processing starting from farming, processing the results, to marketing it is still done conventionally (traditional ingredients) and is very lagging behind other plantation commodities (West Pakpak Agriculture Office, 2007).

West Pakpak Regency is the largest producer of *Gambir* in North Sumatra Province after Dairi, Deli Serdang, Central Tapanuli and Mandailing Natal Regencies. In general, the production of *Gambir* plants is marketed in the form of dried *Gambir* sap for the domestic market and the export market. In general, the Pakpak ethnicity in West Pakpak Regency is classified as part of the Batak ethnic group, such as Toba, Simalungun, Karo, and so on. In West Pakpak Regency, the majority are of the Pakpak ethnicity (Pakpak Bharat Agriculture Office, 2007).

## CHAPTER III

### MATERIALS AND METHODS

#### 3.1. Research Time and Place

This study took place from August to November 2020, in five villages, namely Siempat Rube I Village, Siempat Rube District, Kuta Jungak Village, Siempat Rube District, Kuta Tinggi Village, Salak District, Kuta Babo Village, Tinada District, and Aornakan II Village, Pergetteng Sengkut District, West Pakpak Regency, North Sumatra.

#### 3.2. Tools and materials

The tools and materials used in this study included interview lists, voice recorders, stationery, cameras, *Gambir* leaves, felts, cormorants, gloves, filters, small and large buckets, thin cloth, scissors, bamboo, and sacks.

#### 3.3. Research Methodology

The method used in this research is descriptive qualitative in nature through an emic approach and an ethical approach. The emic approach is intended to obtain data on community knowledge about *Gambir* processing, the benefits of *Gambir* and the use of *Gambir* as a traditional medicine according to the knowledge and language of the local community without having to test the truth. While the ethical approach is used in analyzing data from the knowledge of the community scientifically, in accordance with the literature. Semi-structural interviews are guided by a list of questions (simple interviews) and the selection of respondents is done by purposive sampling method, as a guide for researchers to ask questions to respondents, and is conducted openly (openended). Interviews were conducted with the Pakpak community. Respondents consist of the general public of Pakpak

ethnicity. All information obtained from informants and respondents was recorded and recorded using a tape recorder/HP and then tabulated.

The data collected includes primary data and secondary data. Types of primary data conducted by interviewing about the benefits of *Gambir* and the use of *Gambir* as a traditional medicine and secondary data obtained from previous researchers or books about this research. Collecting data obtained from primary data. Primary data were obtained from in-depth interviews, the respondents were the Pakpak ethnic community with a total of 10 people from each village.

### 3.4. Data Analysis

The data of this study include primary data and secondary data. Primary data obtained from interviews and observations made with the community in the field and secondary data obtained from previous research data and books. The data that has been obtained will be analyzed qualitatively to obtain descriptions of the use of *Gambir* and to find out the benefits of *Gambir* as a traditional medicine by the Pakpak ethnic community in accordance with research conducted in the field.

## CHAPTER V

### CONCLUSION AND SUGGESTION

#### 5.1. Conclusion

Based on the results of research that has been done, it can be concluded that the benefit of *Gambir* is as a treatment. Diseases are categorized as mild disease and severe disease. Mild diseases that can be treated as many as 14 types of diseases and severe diseases that can be treated as many as 5 types of diseases, and another benefit of *Gambir* is as body care by the Pakpak ethnic. The use of *Gambir* as a treatment is greater that is equal to 76% compared to treatment of 24%.

#### 5.2. Suggestion

To complete this research, it is recommended to carry out further analysis of the chemical compounds that play an active role in scientifically using *Gambir* parameters and testing the chemical quality of *Gambir* which has the potential as traditional medicine in West Pakpak Regency. Then so that the local community continues to preserve or cultivate knowledge about the benefits of *Gambir* plants in the research location area.