Changing Acres
Sustainable Agriculture Case Studies

The Indigenous Agricultural Practices of Dolok Mariyah

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PAN Asia and the Pacific
The Indigenous Agricultural Practices of Dolok Mariyah

a survey of three generations

Desa Dolok Mariyah
North Sumatera
INDONESIA

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A subsequent joint project undertaken in 1996, between PAN AP and IFOAM-Asia extended country profile coverage to another seven countries: Bangladesh, Cambodia, China (People's Republic), Korea (South), Laos, Thailand and Vanuatu.

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The Indigenous Agricultural Practices of Dolok Mariyah

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INTRODUCTION

Through generations, agroforestry management has not changed much in Dolok Mariyah Village, Sub District of Dolok Silau, Simalungun District, North Sumatra province. The age-long practice of forest management is still very reflective of the indigenous knowledge and belief system. An indication, is the keeping of traditional processes in opening the forest as in the following steps:

a. Mariri (to choose)
b. Manginas (to cut through)
c. Manobang (to fell)
d. Mangsalapsapi (clear the border)
e. Mabakar (to burn)
f. Mangangkut (clean up)
g. Manuan (to plant)

This and other methods of forest management will be articulated in the main content of this research study.
This study focuses on historical data, like when the village was occupied, how the administrative system is conducted, what is the decision making process and importantly, what was the agricultural system.

Demographic data were also gathered to profile the size of the village, population, equipment/facilities and infrastructures that exist.

**Questionnaire and respondents**

Key personalities, knowledgeable about traditional agriculture system of the village, were selected as key informants. They were also respected men as they are often consulted in the village decision-making. They do not want to be called as guru (shaman) even though they possess such qualities and capabilities.

The guide questionnaire include:

- Manners/steps that are taken in opening the land, or forest and supervising the agriculture activities in a particular village
- Why these steps must be done
- How the key persons or the village informal leaders supervise these activities
- What are their roles in supervising these activities.

The survey was limited to 30 respondents, divided into three age categories. The first category is below thirty years old (Generation C), the second is between 30-59 years old (Generation B), and the last is sixty years old and above (Generation A).

**Data Analysis**

Analysis of the data is based on the results of the interview focusing on the development of technology and the management process and critical activities undertaken by the respondents.
A. The Village

Dolok Mariyah is one of six villages in Dolok Silau District, Regency of Simalungun, North Sumatra Indonesia. It is about 600 meters from the sea surface. The topography is hilly and the village is surrounded by mountains. Dolok in the language of Simalungun, means mountain and Mariyah means crowd. Thus, Dolok Mariyah means crowded by mountains.

To the north of Dolok Mariyah is Marubun Lokung village, while Sarang Padang village borders the south side. Raya District borders the eastern side while Gunung Sinembah village in Gunung Mariyah District, Regency of Deli Serdang occupies the western section.

The village is accessible by a horse drawn buggy path. General infrastructure within the village includes a primary school attended by 60 students and 4 teachers; a meeting hall with an office of the village headman; 2 churches; one volleyball field; and one public health center.

There are 374 persons in the village of the following age compositions:

- 0-6 years: 47 persons
- 7-10 years: 59 persons
- 11-16 years: 77 persons
- 17-55 years: 160 persons
- 55 years old and above: 22 persons

There are 204 men and 188 women. Majority of the people (98%) are of Batak Simalungun ethnicity. The remainder are of Batak Toba and Batak Karo. The village, inhabited by the original tribe of North Sumatra, is "old". The village people are either Catholic or Protestant.
B. Village History

According to Karl J. Pelje (1985), when Anderson (1863-1947) visited Langkat, Deli Serdang, the people were harvesting pepper. Around that time and before pepper was introduced, the farmers in East Sumatra opened and burned the forests during the dry season to prepare the land for rice cultivation, in time for the rainy season.

The Dutch kept their hold in East Sumatra by appointing a king in each specific areas. “Tuan”, the local term for a king, is the highest leader of an area and has the power or authority to make decisions. There were seven Simalungun kingdoms at that time including:

1. Kingdom of Tanah Jawa
2. Kingdom of Siantar
3. Kingdom of Purba
4. Kingdom of Silau
5. Kingdom of Raya
6. Kingdom of Panet
7. Kingdom of Simalakuta
In the early days, Pematang Dolor Silau was a central part of the kingdom of Silau. After the social revolution of the 1950s, all kingdoms in Indonesia were integrated into the Republic of Indonesia.
Pematang Dolor Silau at first remained as the central village. Transportation problems and isolation of the kingdom later however, lead people to abandon the village (Letkol Purn. Mansyur). Dolor Mariyah was formed when transportation between Pematang Dolor Silau to other Simalungun kingdoms became more difficult. Thus, the central government of Silau was later moved from Pematang Dolor Silau to Dolor Mariyah.

In addition to Pematang Dolor Silau and Dolor Mariyah, there were three more villages in the vicinity, namely, Sintunggung, Matondang and Partibi Sinembah. These villages accessible only by foot, however, are currently uninhabited.

**AGRICULTURE SYSTEM**

The shifting agriculture system as practiced in the village involves moving from one field to another. In the early dry season, the forest is cleared and burnt towards the end of dry season. Three types of plants are planted in the new agricultural clearings. These include rice, Capsicum frutescens (chili) and Nicolaia speciosa.

Two planting systems are used. First is to mix the three different seeds and then spread them (similar to the broadcast method) in the field. The second is to place the seeds into the holes, which have been dibbled (drill system).

The first to be harvested is rice, then the Capsicum frutescens and lastly, Nicolaia speciosa. Upon harvesting, the farmers will begin to open new forests. The abandoned areas will be re-planted after five years. Young woods will by which time have covered the land and a tremendous biomass accumulated.

This shifting agriculture system has been sustained for a long time. There are however, some questions to be answered to fully understand the development of this indigenous technology.

**PHOTO 1:**
Nicolaia speciosa  
(Asam Cekala)
There are diverse perceptions of these traditional practices among the villagers. Whilst the old generation (above 60 years old) still believes in the importance of the agricultural ceremonies, the generation ranging between 30 to 59 years old, is ambivalent. Some regard the ceremonies as important, while others look at them as meaningless.

Those below 29 years old, believe the ceremonies are not important and are not inclined to practice them. They also regard the practice of shifting agriculture as ineffective aside from being inefficient. They cultivate their own plants intensively and apply chemical fertilizers.

Religion wielded a big influence in the changes of perception and practices even amongst the elders of the village. At the outset, Christianity was pinpointed as the major instigator for this view change. Of late, there have been some activities initiated to conserve and maintain the indigenous technology in the village. Perhaps, it is time to look closely at these practices, particularly the way new farming generations look at traditional practices and systems compared to the modern system which are currently recognized as unsustainable.

A. Ceremonies in the traditional agriculture system

In “Upacara Tradisional dalam kaitannya dengan Peristiwa Alam dan Kepercayaan Daerah Sumatera Utara”, published by the Departemen Pendidikan dan Kebudayaan (1983/1984), it is said that every ethnic person who wishes to open the forest usually holds a ritual called forest opening ceremony first. In ethnic Karo, it is called Ngumbung Kerangen. “Ngumbung” means to open; “Kerangen” means forest. Thus, a forest opening ceremony is done to make it a suitable field for cultivation.

A leader called guru or shaman (normally, a respected male elder in the family) leads this ceremony. They believed that the forest is under the authority of Empong, and the land is owned by Beraspati tanah who makes the lands fertile.

In ethnic Pakpak-Dairi, the ceremony is called Menoto; derived from the word “toto,” which means to start. “Menoto” thus means the first ceremony in converting the forest into a new unirrigated field. Local folks believe that someone owns the forest and it is necessary to maintain good relationship with the unseen owners of nature. The landowner is called Beraspati ni tanah. Commonly, every family conducts the ceremony.

Essentially, every ethnic grouping have their own ceremonies in conducting agricultural activities which is generally meant to maintain good relationships between human and the unseen owners of nature.

In ethnic Melayu, the ceremony of rice seed planting is called Mulaka Nukal, which is led by a pawang. In Karo, rice planting is called Merdang or Nuan Page, while in Pakpak-Dairi it is known as Menanda tahun, which is upheld collectively by the local people.
The harvesting rice ceremony in Karo is called Mutikken page, which literally means harvesting the rice. Harvesting is done individually by the owner of the land from morning until afternoon. The purpose of the ceremony is to get permission from beru dayang (godess of rice) to harvest rice. The fathers do the prayers while the mothers do the harvesting. From the volume of harvested rice, it can be known whether the goddess has allowed them to harvest or not. If they have not been given permission on that day, the ceremony is repeated the next day to lessen or eliminate actions that may destroy the rice.

Another ceremony Menanggak-nanggakken is performed when the rice plants turn yellowish in color. Another name for this ceremony is ugor page, which means preparing the yellow rice as an offering to the goddess of rice. Before harvesting, mengirik, is carried out. Derived from the word “errik”, it means separation of the rice from the shaft.

B. The Social System of Batak Simalungun

Among the Batak Simalungun people, their traditional social system is more deeply rooted and stronger than the kingdom's social system. In terms of land holdings and tenure, kings in Simalungun are the landowners. He has to find workers from the newcomers to prepare and cultivate his land.

The guiding living principles of the people in their daily life are contained in the Habonaron do bona. “Habonaron” means truth, honesty, purity and nobleness. “Do” means yes, and “bona” means resources or hope, the base or foundation. Thus, Habonaron do bona means derived from the truth, purity and nobleness (Departemen Pendidikan dan Kebudayaan. 1986/1987).

C. The Simalungun Calendar System

Hatihir ari sitolupuluh (time and 30th day) according to Habonaron do Bona, are the guidelines for time, which needs to be observed. Violations may reportedly result in a loss or even death.

The names of days (from first to last) in Simalungun are Aditia, Suma, Anggara, Mudaha, Boraspati, Shihras and Samisara. Hatihir (time), also make time separations during the 24-hour day period. The night is divided into five segments and the day is also divided into five time segments.

An odd month has 30 days (sada sipaha/sada bin tang) and an exact month has 29 days. One year has twelve sipahas or months which are as follows, (from first to last) sipaha sada, sipaha dua, sipaha tlu, sipaha opat, sipaha lima, sipaha onom, sipaha pitu, sipaha wuluh, sipaha siwah, sipaha sapuluh, sipaha luyu, sipaha urung.
In order to determine the first month sipaha sada, the position between two star groups in the sky is used as guide. When their formation appears to be a hala or scorpion, one is called Hala pariama, the another, Hala sussang.

The principles in determining sipaha sada are as follows:

At 18.30 p.m. Hala pariama lies on the east side with a clear view of:
- gambil pariama (clamps of scorpion)
- babah pariama (mouth of scorpion)
- pusu-pusu pariama (chest of scorpion)

at the same time Hala sussang lies at the west side with a clear view of:
- ihur/pandoitni hala sussang (tail of scorpion)
- parsanean hala sussang (anus of scorpion)
- boltok hala sussang (stomach of scorpion)

Hala pariama and Hala sussang are the traffic lights of night and day, which must be heeded so that losses or even deaths can be avoided. Both Hala pariama and Hala susang are dangerous for five nights each, in a month.

Good days are those when one can expect lots of help in an event of an accident. Bad days are those one could not expect much help in the event of an accident. Whilst some bad days can be adverted by a ceremony called Panayomi, some cannot be adverted, such as when:
- the moon lies at the body of the scorpion Hala susang
- the moon is in its clamps (mangutangi gassip/gambil),
- the moon is in its mouth (mangutangi babah)
- the moon is on its neck (mangutangi borgok)
- the moon is on its chest (mangutangi pusu-pusu)
- the moon is on its stomach (mangutangi boltok)
- the moon is on its anus (mangutangi ihur/pandoit)

(from Naskah Pemaparan Budya Spiritual Habonaran do Bona, Departemen Pendidikan dan Kebudayaan 1986/1987)

D. Forest clearing and cultivation system

The respondents representing three generations observed that there is no new technological development significant enough to effect major changes to the farming systems in the area. Techniques from opening the forest until harvesting has not changed from one generation to the next.

Generally, the following steps are followed in opening the forest:

1. Marririt (to choose)

A group of people marches to the forest for land selection. The first person walking in front of the group has the right to do the first selection then followed by the others.
2. Manginas (to cut through)
Cutting through the small woods and tree branches.

3. Manobang (to fell)
Felling of huge and big trees.

4. Mangsalapsapi (clearing the border)
Making or building a border by cleaning the edge of the forest, separating the leaves from dry woods, 3-10 meter in distance.

5. Mambakar (to burn)
Burning the felled trees that have been dried (about one month after felling).

6. Mangangkut (cleaning up)
The burnt area is cleaned so that it can be planted. The wood are arranged like a fence structure to prevent stray pigs from entering the area.

7. Manus (to plant)
Plant the areas with a combination of seed materials, e.g. Capsicum frutescens (chili) and rice.

The difference in implementation of the above, lies in the supervision of the activities and the symbols used. The old generation are more concern with doing these activities on the good days. The good days can be identified directly from the moon's position or by referring to the Batak calendar, available from the market.

PHOTO 2:
The forest (new land) before the trees are cut.
PHOTO 3:
The forest (new land) after the trees are cut.

PHOTO 4:
The land after "mambaka" (burning) process.

PHOTO 5:
Chilli dominates the land after harvesting rice.
Current practice according to respondents.

Choosing a site or location

Field activities, beginning with searching for a new location, starts early in the dry season or at the end of the rainy season. A maximum site size of 5 ha. is allowed (uncommon). Generations A and B prefer to open new forests to make new fields. 40% of the respondents of generation C, expressed interest in intensifying and developing existing sites rather than searching for new ones.

There is an understanding that the suitability and availability of the land to be opened shall be determined by the nature of plant growth (types and number) found at the location. Land planted with long term crops would usually denote use by some one else. On average, the land that would be opened up at Dolor Mariyah, is such as to be able to accommodate the planting of two cans of rice seeds, i.e. one hectare.

According to Arionang Robert (1995), constructing or opening up new land is also much influenced by the family's basic requirement like food and the total number of women workers that would be involved.

Felling and burning

Felling and burning methods have not changed at all. The felling of trees is always started in the months of July-August, or early in the dry season. Small branches are cut first before the big ones. The cut branches lower the ground for tree trunks. Smaller trees are then felled first before the big trees. Felling is also done from the bottom edge up to the top. The process stacks the big trunks on top of smaller ones.

As smaller branches are drier and easier to burn, the arrangement in effect facilitates the burning of the bigger tree trunks. If the process is reversed, the fire may consume the small and easier to burn wood at the top without fully burning the big pieces at the bottom.

Before burning, 3 meters from each side of the site is cleaned up so that the fire will not reach the area not intended for use. Burning is done on mid-day or afternoon, from the direction where the wind blows.

Planting and harvesting

There are some alterations in planting methods. Generation A prefers to broadcast the seeds, whilst generations B and C prefer planting in dilled holes. Up to several years ago (even to date), the seeds of Capsicum frutescens and rice are first mixed before planting. Then when the rice grows as high as 10 cm, the weeds are cleared and seeds of Nicolaia speciosa are spread. Nicolaia speciosa is popularly planted by generations A and B. Generation C however, does not plant it anymore because its market price is relatively low, while the cost of production is high.
90% of the respondents of generation A mix and plant their seeds into dibbled holes, of 4 cms in diameter. The total number of mixed seeds in each hole is about 10-30 seeds. The remaining 10% plant the seeds, firstly into eleven holes and then broadcast the remaining. This is a precondition so that the owner of the forest protects and takes care of the plants. In Simalungun language, sapuluh sada means eleven, and is suggested as the symbol of parsadaan, meaning unity of seed, land and nature.

80% of respondents of generation B plant in dibbled holes, the remaining 20% broadcast them. All respondents of generation C, plant the mixed seeds into dibbled holes.

The change from broadcast to planting in dibbled holes gained widespread acceptance as a method to prevent the seeds from being washed away due to rain and wind. Furthermore the growth direction of the plants can be set through such drill planting.

In generation B and C, fertilisation treatment has been introduced and is widely done. When the rice plants reaches 10 cm in height, weeding is done and fertilisers (e.g. TSP and Urea) are applied. Fertiliser application is continued monthly if the crop is in bad shape.

Only 20% of generation A respondents plant Nicolaia speciosa while 70% plant cucumber and corn on the edge of the site after weeding. Generations B and C do not plant Nicolaia speciosa for economic reasons. This plant commands a low price as compared to Capsicum frutescens. For a long time, Nicolaia speciosa was planted because of its economic advantages. Aside from being a cooking spice and its medicinal qualities, it is easily grown.

Harvesting follows the traditional method. The rice grown are mainly of local origin, of different varieties and maturing time. Rice is harvested first with a knife and then the stalks are laid down as mulch. This helps the red pepper plants to grow better. Harvesting pepper is done a day before being sent to the market.

E. Understanding of Symbols, Ceremonies and Traditional Agricultural Beliefs

Generally, it can be observed that mystical and sacred beliefs have decreased amongst the younger generations. The symbols are hard to rationalise and the beliefs and ceremonies are being challenged by modern thinking. There is also the influence of later religions, which teaches that humans are the owners and processors of nature. Furthermore modern scientific knowledge is expected to be able to overcome every problem encountered in agriculture.

The following are some of the traditional beliefs and patterns particularly related to the agricultural calendar.
Good days according to the Batak Calendar

Good days are significant days to remember in performing necessary activities. They are outlined in the Batak calendar, available commercially. The Batak calendar is still used by the respondents as a basic reference in conducting their agricultural activities. 40% of the respondents in generation C however, do not use this calendar. They believed that every day is a good day and agricultural activities can be scheduled for any day.

Examples of indications from the Karo Calendar (the calendar of one Batak sub-ethnic group that is usually used in Dolok Mariyah) for activities are as follows:

Aditia: a good day for making plans, holding public meetings, and making agreements.

Suma: a good day for two-legged beings, people and chickens; also good for hunting, fishing or trapping animals.

Nggara: a hot/angry day – ideal for fighting, getting rid of bad luck; making medicines; hunting or clearing the forest; giving back tenungan orang or the bad spirit sent by duluun.

Budaha: a good day for four-legged beings, also best for rice planting or putting the padi into the lumbung [rice barn]; and good for planting padi on dryland. It is also ideal for holding a party or celebration.

Beraspati Pultak: a slippery or muddy day. Good for a party, or for building/moving a house, to look for work; and to engage in a struggle for a cause. It is however, not a good day to fight.

Cukra enam bercini: a good day for finishing work and other things without obstacles. Also good for scouting work, approaching important people, starting to sell things, holding marriage parties or getting married, beginning farm work; and contemplating a process of formally expressing serious love interest.

Belah Naik: a day for kings, pelaris or persuasion with magic. It is a day also ideal for promoting and selling; heading to the mountains or uplands; looking for work; beating the gendang [Karo: traditional drums]; recalling the protective spirit that has left because it was frightened; taking a bath in water mixed with jeruk purut (citrus) because one has achieved something he/she desired.

Aditia Naik: a day for attending parties or meetings, beating the gendang, bathing in the river (before approaching a certain intention), moving houses or starting retail business; and heading to the mountains.
Sumana: not a good day, people should be extra careful in doing anything. It is ideal day for hunting though, setting traps on land or water.

Nggara sepuluh: a hot day, people should be tactful in what they say to avoid conflicts. It is a day better suited for making medicines; beginning work; getting rid of bad luck; moving houses; weddings and playing the gendang. It is not a good day though for moving the bones of ancestors, if they need to be moved.

Budaha ngadep: a day with no obstacles, good for hosting and attending parties.

Beraspati tangkep: a good day for meeting important people or bureaucrats; look for work; call the house spirits, bathe with flowers to ask for good luck or favors; and offer prayers to the almighty spirit.

Cukradudu (lau): a good day for weddings, planting bananas, visiting respected people – especially, parents or in-laws; moving house; and bathing with flowers.

Belah purnama raya: day for kings, good for big parties with important people and taking a flower bath. It is also ideal for youth parties, to take holy waters (the gendang should be used), and bring the children to the house of parent in law (especially, if the child is sick or needs forgiveness, or needs a name).

Tula: a bad day, people are not interested working on this day. Nevertheless, good for planting coconut or beginning to open/cut trees in the forest.

Suma cepik: not a good day for carrying out something - especially, if the outcome of the activity will not be worth the cost. However, it is day devoted to planting medicinal plants, hunting or setting up traps, and fishing.

Nggara nggotula: a good day to get rid of bad luck, making medicines, taking a bath in water mixed with flowers.

Budaha gok: a day the padi is harvested. Take the seeds, put the harvested rice into the rice-barn, and separate the grains from the rice stalk by using the feet.

Beraspati: good day for cutting wood for a house, making a small hut in the dry fields or ladang, and opening the forest.

Cukrasa: good day for making medicines, moving bones, playing the gendang, walking or calling the village spirit.

Belah turun: good day for getting rid of bad luck, setting traps, fishing, hunting or going to the sea.
Aditia turun: good day for making medicines, bathing in water mixed with jeruk purut for singles, or getting rid of bad luck. Also, it is ideal for hunting, fishing, going to the sea, and getting rid of diseases.

Sumana mate: good day for setting traps on land or sea; setting forth on water; and hunting for rubia (a type of deer).

Nggara simbelin: good day for making medicines, taking a bath with flowers, getting rid of bad luck or diseases, and praying for good things to happen.

Budaha medem: good day for planting, going to the fields, giving away rice or harvesting. Also, ideal for taking padi from storage, and rice threshing. Perfect for taking a leave or setting off on an adventure.

Beras pati medem: good day, auspicious for ceremonies, to give food to parents, visiting in-laws, having a party/celebration, and making medicine.

Culera mate: good day for getting rid of bad luck and making medicines. Also best for hunting and fishing.

Mate bulan: good day for getting rid of bad luck, restoring positive outlook and energy; also, for hunting, fishing or going to the sea.

Dalín bulan: generally not a good day, although a fine day for ear piercing.

Sami sara: good day for finishing work, ending aron (the group of young people working in the fields), asking forgiveness and praying to the spirit (especially for grandmothers). Also, ideal for making request to the village medicine man or dukun.

Signs of nature or dreaming for a new Land

Nature provides guidance either directly or through dreams. Meeting an intruding animal such as snake, ant nest, etc. during a travel or in cleaning an area is an indication that the land is not suitable and hence, should not be selected. Therefore, it is important to seek another one or change a section. If there is no intruder met, then a handful of soil from the chosen land is taken and wrapped with a cloth and placed under the pillow before sleeping. Having a dream of meeting a wild animal or snake within 3-4 days means that the land is not suitable.

If the person has a good dream or could meet a goldfish, it is an indication that the land is good. It is assumed that every area has a creature or entity as inhabitant. Hence, it is important to know first whether the creature gives permission for the land to be cultivated. If there's an indication that it does not agree with the cultivation, and it is not heeded, the crop being planted
will be destroyed, or worst, might even cause a tragedy to the whole family.

All respondents of generations A and B significantly consider direct signs of nature such as meeting wild animals. If in the choosing process for the land they met a snake or another wild animal, they will delay the processing of the land and find another location. Bad dream (nightmare) while sleeping at night is also considered as bad signs.

Generation A and 20% of generation B take and cultivate the land because of dreams or premonitions. Generation C does not consider the dream process as a basis for taking or cultivating the land.

Signs and symbols of land width that will be opened

The process starts by first cleaning a 2-3 square meter area of the chosen location. A cleaned wood trunk found at the site would either be hanged or implanted from the location on the tree or the ground. The number of wood implanted or hanged determines the number of seeds to plant. A single wood means a can of rice seeds. Two woods mean that the owner will plant two cans of seeds. A can of seed is approximately enough for a half hectare of land. Usually, a person opens the land with a measure of two cans of rice seeds or about one hectare.

Preparing the land and stacking the wood pile as a sign of claim that the land will be opened is carried out by all respondents.

Keeping red peppers in the pocket

It is believed that when preparing the land, red peppers should kept inside one’s pockets so that wild animals and other dangerous events may not befall them. Only 10% of generation A however, still believe in this.

Role of prayer and the number of holes in planting

Planting is done after the rain. When planting, the rice and chill seeds are mixed together. The first planting is done in the required holes that total to about eleven holes. Then the remaining mixed seeds are spread in the area that has been wet by rain. Then a prayer is done, promising the owner of the world that after harvesting, he will be served with chicken, etc. Praying is also a means of showing appreciation to the spirits inhabiting the land. Eleven holes resemble a wish to obtain good yield. The good days to begin planting are Budaha, Cukra and Beraspati.

After the land is opened, there is a need to bury a roll of Andor Hondali, a kind of creeping plant in the ground to free the area from the disturbances of wild animals such as wild boar, monkey and other pests.
All respondents of generation A pray to the god of the land so that the plants will grow easily and in order to avoid danger and evils. Only one plant the seeds into eleven holes and then broadcast the rest. Andor Hondali planting is also done by only one respondent in generation A.

Generation B farmers pray too, before planting. It is both an expression of their faith and request so that their plants will grow easily and produce more in order to have good income.

Generation C respondents pray to God in the church.

Mixing red pepper and rice

Mixing of rice and red pepper seeds before planting is done by respondents of all generations. Generation B and C farmers stress the efficiency aspect of doing so rather than belief. Rice is needed for self consumption. Red pepper is still planted as it commands a good price.

Slaughtering the chicken before rice harvesting

When the rice is mature and about to be harvested, chicken butchering (Cukra siemer borngi or Budaha Gok) is conducted. Part of the chicken is placed in sumpit (traditional packing) and then placed in the middle of the field accompanied by a statement of praise. This is a symbol of thanksgiving dedicated to the guardian of the land for the success of the crop.

All respondents of generation A and 20% of generation B carry out the ceremony. The purpose is to thank God for the harvest. Meanwhile, for generation C, they slaughter the chicken whenever they wish to eat it, and not because of the harvest.

Long term plants as sign of ownership

Planting long term plants such as durian, mangosteen, coffee, rubber, etc. considered signs of land ownership and tenure were considered by all respondents. Lands, which have been planted with long-term plants, may not be opened. Permission from the owner should be requested should one wish to open and cultivate the land.

Hanjuang planting as a land border and symbol mitigating disaster

The Hanjuang plant is reddish in color, and can is easily identifiable. Tall, yet growing easily and possessing a long life span, it is suited for border or landmarks in an agricultural area.
Role of Shaman

All respondents responded that the shaman need not have a role in their agricultural activities. Generations A and B suggest that the good days guide can be obtained in the Batak calendar. In addition, Christian religion prohibits them to trust the shaman.

Generation C meanwhile sees the role of the shaman as not needed anymore in their agricultural activities. In the past, the shaman determines the good and bad days in relation to executing agricultural activities. They are not needed anymore at present since the Batak calendar already provides the necessary guidelines.

CONCLUSION

It is not known when the agricultural system began. The system has been in existence even before the formation of the village. In the past, it is common belief that the shaman can call or instruct the spirit (habonaron) to supervise activities and keep the land safe. This belief is not held anymore today. The shaman no longer plays an important role in agricultural ceremonies.

1. Generally, the technologies discussed earlier have not changed drastically from one generation to another. However, for the younger generation as is happening to generation C (less than 30 years old), some of the traditional agricultural customs and ceremonies are still conducted but most don't believe anymore in the truth-value of these practices.

2. Symbols still are very much in use in some agricultural ceremonies particularly the following:

   Hanging of wood up on the tree in the area that has been opened to determine the size of the area to be cultivated.

   Lands, which were planted by long-term plants, are considered owned lands and others who wish to cultivate it should seek permission from the owner.

3. Good days are still being used as agricultural ceremony guidelines and can be referred to from the Batik calendar that is commercially available.
The agricultural system, farming techniques and indigenous agricultural ceremonies have survived in Dolok Mariah. Following are some recommendations for these practices to be sustained.

1. It is important to explore the symbols and the technological link of these to sciences. Mysticism and superstitious beliefs exist. But some scientific explanations of these beliefs could be explored for the young generation to understand, follow and appreciate.

2. Some information on modern farming technology is needed to guide the farmers on the suitability of the technology to local conditions. Do simple comparative experiments of modern farming technology coming into the area and their application vis-a-vis indigenous practices. Examples of these are the use of chemical fertilizers in sloping or fertile areas. A simple experiment to show the comparison will help guide what is better for the farmers.

3. To improve the economic value of the farming system, integrate marketing components organic production into the whole farming system. Consider also awareness building of the consumers who will be the target market group for the organic products. Aside from that, they should also be made aware of the adverse impact of pesticide use.

4. There is a need to educate people about the impact of land conversions, the selling of their lands to investors and possible dislocations of their families once these lands are converted and sold out for industrial and non-food base industrial activities. Land tenure must be secured so that long term agricultural plans and farm development prospects can be sustained. Not conserving the land would also result in environmental degradation and loss of ecological balance.
Pesticide Action Network Asia and the Pacific (PAN AP) is one of five regional centres of PAN International - a global coalition of citizen's groups and individuals who work to promote sustainable agriculture, and oppose the use of pesticides. PAN AP is dedicated to ensuring the empowerment of people, especially women, agricultural workers, peasant and indigenous farmers. PAN AP is specially committed to protect the safety and health of people and the environment from pesticide use.

*Changing Acres* is the publication series of PAN AP's regional study on sustainable agriculture. The study launched in February 1994, is intended for policy and strategy building to strengthen sustainable agriculture development in the region. The study will also guide PAN AP's sustainable agriculture programme activities. The initial exercise, including country profiles, a benchmark survey and selected farm case studies, covered seven countries: India, Indonesia, Malaysia, Nepal, Pakistan, Philippines and Sri Lanka.

A subsequent joint project undertaken in 1996, between PAN AP and IFOAM-Asia extended country profile coverage to another seven countries: Bangladesh, Cambodia, China (People's Republic), Korea (South), Laos, Thailand and Vanuatu.