

Chapter 3

Calendar Keepers: The Unsung Heroes in Indigenous Landscape Management



Kreni Lokho, F. Merlin Franco, and D. Narasimhan

Abstract Indigenous communities use their calendric knowledge to carry out landscape management activities. Using the example of the Mao Naga community of Northeast India, we demonstrate that keepers of such calendars are facilitators of landscape management activities of the community. The Mao Naga community chief once served as the chief calendar keeper from whom calendric information flowed to village-level calendar keepers. The chief calendar keeper processed information on the skyscape and local seasonal indicators and disseminated it to the village-level calendar keepers, and other community members. The calendar keepers determined the dates for sacred holidays called *genna*, and festivals which in turn determined landscape management activities that include agriculture, hunting and fire management. The village-level calendar keepers combined calendric information received from the chief calendar keeper with their own observation of skyscape and local seasonal indicators. The observation of local seasonal indicators by the village-level calendar keepers enabled them to keep the ecological calendar dynamic, flexible and relevant to the landscape. The Mao Council has introduced a printed traditional calendar which makes it easier for determining lunar months and festival days. But it lacks information on sacred holidays and local seasonal indicators. We recommend that the printed traditional calendar be developed further to include information on sacred holidays and local seasonal indicators. The improvised printed ecological calendar should then be administered by the calendar keepers.

Keywords Traditional ecological calendars · Phenology · Traditional knowledge · Seasonal knowledge · Climate change

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3.1 Introduction

In landscapes managed by indigenous communities, collective and individual actions related to landscape management are facilitated by traditional ecological calendars (Franco 2015). These calendars link people's knowledge of skyscape with that of the landscape, and social practices (Ammarell 1988). Observations made by local communities on changing weather patterns due to climate change, and its influence on terrestrial biomes are as reliable as formal weather forecasting systems (Savo et al. 2016). Since traditional ecological calendars of local communities are repositories of such knowledge, they can help in understanding the impacts of climate change and adapt to it at local levels (Armatas et al. 2016). Owing to the complex calculations required for calendar keeping, communities with robust calendars such as the Maya and Nahuatl of classic Mesoamerica were also known to have dedicated calendar keepers (Rice 2007). Calendar keepers are curators of the community's calendar. They gather information on the skyscape (sun, stars and moon), and local seasonal indicators (calendric plants and animals) to make calendric calculations (Gell 1992). Thus, they are key individuals holding immense traditional knowledge (TK) related to the traditional ecological calendar of the community. Unlike indigenous languages and healing practices, traditional ecological calendars and calendar keepers have received very little attention from the academic community. This chapter examines the role of the traditional ecological calendar of the Mao Naga people of North-east India in facilitating landscape management. The objectives are threefold: (i) to document the Mao Naga traditional ecological calendar, (ii) to understand its role in landscape management and (iii) to highlight the role of calendar keepers in maintaining the Mao Naga ecological calendar, and making effective use of it in landscape management.

Northeast (NE) India comprises eight states: Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. Northeast India is a part of geographical Southeast Asia, unlike the rest of India that is in South Asia. The region is popular for its rich biocultural diversity. Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura are part of the Indo-Burma biodiversity hotspot, while Assam and the upper region bordering Arunachal Pradesh falls under the Himalayan hotspot (Mittermeier et al. 2004). Of the 450 ethnic communities in India, a whopping 225 have roots in NE India. The region also harbours 400 languages and dialects (Chatterjee et al. 2006; Mentschel 2007; Singh et al. 2015; Vadlamannati 2011). This biocultural diversity is a result of diverse sets of traditional agricultural practices, landscape management regimes, folk medicine and forest dependency—all facilitated by traditional knowledge (Singh and Sureja 2006). However, NE India, like any other part of India, is not immune to factors that lead to erosion of biocultural diversity, and despite the increasing focus on the region, there is plenty of work to be done to prevent loss of biocultural diversity. Hence, we collaborated with the Mao Naga community of the Senapati district in Manipur, to document their traditional ecological calendar, its history, significance and present status among the community. Much of the calendric knowledge could be considered passive, due to the erosion of

Table 3.1 List of collaborating knowledge partners

Sl. No.	Name of the knowledge partner	Age	Sex	Village
1	Adahrü Nepuni	86	M	Punanamei
2	Athikho Kreni	57	M	Punanamei
3	Besü Athia	63	F	Shajouba
4	Deli Kholi	45	M	Punanamei
5	Late Dihrü Kholi	92	M	Shajouba
6	Heni Chakhouu	82	M	Shajouba
7	Hrüni Adaphro	49	F	Punanamei
8	Hrüni Katia	49	F	Shajouba
9	Hrüni Salew	40	M	Punanamei
10	Koso Komuhra	76	F	Punanamei
11	Late Athisü Hrüni	98	M	Punanamei
11	Lohrü Lidzüsa	60	F	Punanamei
12	Lokho Ashuli	46	M	Shajouba
13	Loli Kapani	70	M	Pudunamei
14	Loli Salew	73	M	Pudunamei
15	Makabo Kaikho	62	M	Punanamei
16	Mathibo Khazha	80	F	Shajouba
17	Mobo Besa	74	F	Shajouba
18	Modoli Pfokrehrü	72	M	Shajouba
19	Sanuo Nepuni	80	M	Punanamei
20	Tasoni Ashührü Romeo	53	M	Punanamei

traditional institutions and cultural practices, the influence of the Gregorian calendar, and changing religious beliefs. By revealing the substantial passive knowledge on the calendar, this study lays foundation for the revitalisation of the Mao Naga¹ ecological calendar.

3.2 Methodology

Fieldwork was carried out during 2013–2018 by the first author during which 20 knowledge partners from the villages Punanamei and Shajouba were interviewed (Table 3.1). We use the term ‘knowledge partners’ to refer to the members of the Mao Naga community who had participated in the first phase of our study. We find this a better alternative to ‘respondents’ or ‘participants’ as it recognises their

¹ Mao Naga are anthropologically considered as one of the sub-groups of the Shüpfomei Naga, the other group being Poumai-Naga (Kapesa 2017; Nepuni 2010). The study focuses on the traditional ecological calendar of the Mao Naga alone.

intellectual contribution (traditional knowledge) to our study. The interviews were open-ended, carried out in a conversation style. The data collected is supported by participant observation of the first author who is also a member of the same community. The second phase of the study was conducted in December 2017 and January 2018, involving 20 respondents ($m = 13$, $f = 7$) to understand the flow of calendric information in the community. These respondents were different from the knowledge partners; they were selected through snowball sampling and interviewed with a structured questionnaire. To map the flow of calendric information in the community from people to people, we asked three questions: *Q1. From whom did you receive calendric information in the past two years? Q2. To whom did you transmit calendric information in the past two years? Q3. What would you prefer—printed calendar or the traditional system?* The questionnaire did not address information obtained from the newly introduced printed traditional calendar. The respondents of this questionnaire involved a *movuo* (the traditional community chieftain), kin of *movuo* and elders from Punanamei and Shajouba village. All respondents were above 40 years of age. Field data on *genna* (sacred holidays) and festivals were crosschecked with available literature such as Nepuni (2010) and Saleo (2011). The Madras Christian College in Chennai, under whose aegis the research was conducted, does not have an ethics board. Hence, the code of the International Society of Ethnobiology (2006) was used as a reference, and utmost care was taken to ensure that the study conformed to the code. Written Prior Informed Consent (PIC) was also taken from the knowledge partners and respondents prior to the interview.

3.2.1 *The Mao Naga Community*

Mao Naga, an ethnic community of Naga group, inhabits the Senapati district of Manipur in Northeast (NE) India. The study region falls between 24.37° North latitude and 93.29° East to 94.15° East longitude with an annual rainfall of 671–1454 mm. The total geographical area of the district is 3271 km² (District Administration Senapati Manipur 2019). Mao Naga inhabit 58 villages in the district, of which 20 are federal units (Kapesa 2017). The total population is 116,374 (Census 2011). The people of Mao Naga are also known as Ememei or Mao as a whole. However, the name Mao Naga is the popular term used to denote the community. The people are chiefly agrarian and cultivate rice as their staple food. A majority of the Mao Naga today practise Christianity, with less than 1% of the total population practising Mao Naga religion that follows the traditional doctrine of *pfope zhi*.

3.2.2 *Botanical Inventorying*

Fieldtrips were undertaken to specific habitats identified by the knowledge partners. Voucher specimens of plants identified by the knowledge partners on the field were

collected and identified using Floras including (Hooker 1872–1897; Kanjilal et al. 1934–1940; Singh et al. 2000, 2002) as well as e-floras of China, Nepal and Thailand (www.efloras.org). Identifications were confirmed by Dr. K. Ravi Kumar of Trans Disciplinary University (TDU), Bengaluru, and nomenclature was updated by referring to databases such as www.tropicos.org, www.theplantlist.org, www.ars-grin.gov, www.efloras.org, and relevant revisions and monographs.

3.3 Results

The Mao Naga traditional ecological calendar is composed of three components: the lunar calendar, the solar calendar and local seasonal indicators. The lunar calendar determines the dates for sacred holidays called *genna*, and festivals that regulate important activities of the community connected with landscape management, while the solar calendar is only used to keep track of years. The lunar calendar is harmonised with the solar calendar by the introduction of an intercalary month once every three years. Much of the landscape management activity undertaken by the Mao Naga community is concerned with agriculture. In the past, data obtained by observing the skyscape (phases of the moon and the sun) was triangulated with information from the landscape (phenology of plants, insects and birds) by the calendar keeper—a customary office held by the *movuo* (Fig. 3.1). The term *movuo* refers to the common chief of the entire Mao Naga community, as well as the chiefs of individual villages. Thus, in the past, village-level calendar keepers were affiliated to a chief community-level calendar keeper, all known by the term *movuo*. At present, the Mao Council has donned the role of community *movuo*. The Mao Council has introduced a printed ecological calendar that has replaced much of the calendric calculations that were otherwise carried out by the *movuo* along with the sun watchers and moon watchers. Detailed results are organised as follows:

Sections 3.3.1–3.3.3 outline the results of our effort to document the Mao Naga traditional ecological calendar. In Sect. 3.3.1, we present the Mao Naga lunar calendar, and the sacred holidays (*genna*) and festivals stipulated by it. In Sect. 3.3.2, we present the solar calendar, whereas in Sect. 3.3.3, we present the local seasonal indicators. Sections 3.3.4 and 3.3.5 provide an understanding of the role of *movuo* as calendar keepers. Section 3.3.6 gives an understanding of the Mao Naga calendar in 2019. Finally, Sect. 3.3.7 shows the flow of calendric information from the calendar keeper to the community members.

3.3.1 The Lunar Calendar

The Mao Naga lunar calendar consists of 12 months: *chiüthuni* (January), *chiüsolopra* (February), *orolopra* (March), *khranü* (April), *khrana* (May), *pfozü* (June), *sale*

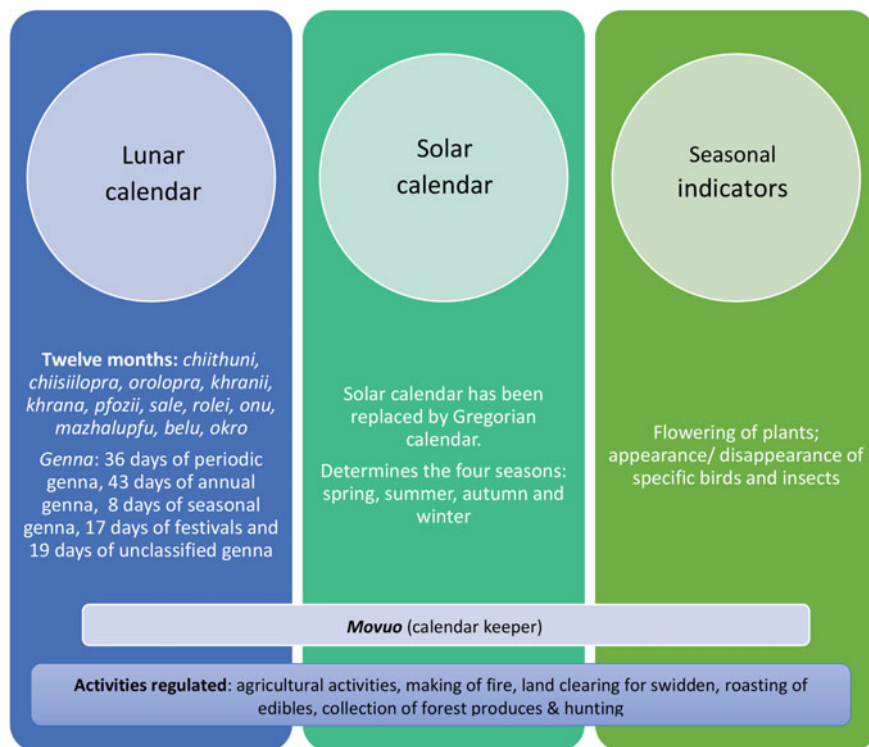


Fig. 3.1 Schematic representation of the Mao Naga traditional ecological calendar

(July), *rolei* (August), *onu* (September), *mazhalupfu* (October), *belu* (November) and *okro* (December).

The twelve months of the lunar calendar together account to 355 days in a year. In order to harmonise the lunar and solar calendars, the Mao Naga insert an intercalary month of 30 days called *sale kahei* (second *sale*) in every third year, after the regular month of *sale*. Traditionally, the chief *movuo*, who hailed from Pudunamei village used to effect the harmonisation by taking into consideration the local seasonal indicators, and data from sun watching. A festival called *saleni* is celebrated ahead of the inserted month, soon after paddy is planted in the wet terrace fields. The 355 days in the lunar year indicate that the Mao Naga lunar calendar is a synodic calendar. Thus, in 12 years, there would be four Mao Naga leap years. In the Gregorian calendar, 12 years equal 4383 days ($365 \times 12 + 3$ leap days). However, for the same period, Mao Naga lunar years would have amounted to only 4380 days [$(355 \times 12) + (30 \times 4) = 4380$]. Hence, to harmonise the lunar years with the solar years, the Mao Naga introduce an additional day to the intercalary months ($30 + 1$) for all leap years in the 12-year period, except the first. This would take the total number of days in every 12-year period of the Mao Naga lunar calendar to 4383 [$(355 \times 12) + (30 \times 4) + (3 \times 1)$]. The first day of the lunar month (i.e. *okhro kakha*) for

the villages was largely calculated by the respective village *movuo*. Thus, there used to be considerable diversity in the way the Mao Naga lunar month was determined across the villages. Errors used to occur at village levels in calculating *okhro kakha*; this phenomenon was reckoned as *okhro khamashü*, meaning ‘an error in counting’. The cultural manner of applying the term *okhro khamashü* does not criminalise the perpetrator of the ‘error’ who is the village *movuo*, but only accounts for it.

The month of September (*onu*) was once considered as an unfavourable month, and allowed to ‘pass by quickly’. Weddings and reunion of divorced couples were not permitted, as such couple would turn poor quickly just like the month. If weddings were to be permitted during this month, child delivery would happen in the month of *pfozü* or *rolei* when the community would be busy planting paddy, and nursing the child would hamper agriculture. Besides, *onu* is also the month preceding harvest when most food stock would be depleted, and people would have to be frugal with whatever was available. This shows that the calendar was regulating nuptial relationships and associated celebrations over the temporal scale, so as to avoid interference with paddy transplantation. The calendar also ensured that weddings happened at a time when enough food stock was available for feasting. The belief that a month can be allowed to ‘pass by quickly’ also indicates that the Mao Naga calendar considered time could be culturally controlled. However, the beliefs associated with the month of *onu* are not prevalent anymore. The Green Revolution and the government-run Public Distribution System (PDS) have ensured food security throughout the year. This eliminates the need for the community to plan weddings and celebrations anticipating lean seasons of food availability.

The month of December (*okro*) is the month of mourning. It is believed even today that the deceased come home to celebrate with the living. Villagers offer food and drinks to the spirits before consuming food; such ceremonial food is served on platforms out of reach for rodents and insects, but easily ‘accessible’ to the dead. During *okro*, people are advised by the elders to stay indoors after dark. It is also believed that if the first person to die in this month is an elderly person, then the deceased would open the *kathilu/kathilozhu*, a symbolic gate between the world of the mortals and the deceased. This would pave way for a series of deaths. On the other hand, if the first person to die happens to be a youngster, she/he would not remember the route to the symbolic entrance and thus, there are fewer incidents of death.

3.3.1.1 Calculation of Lunar Months

Lunar months were calculated by both the chief *movuo* as well as the village *movuo*. The chief *movuo* would communicate the commencement of a new month by yelling from the top of a customary mound. A village *movuo* would then either follow the information as such or calculate it using his own expertise and inputs from moon watchers and observation of local seasonal indicators. According to the late *movuo* of Shajouba village, the accurate calculation of the lunar days in the past was done by the *movuo* by covering the face with a piece of white transparent cloth while gazing



Fig. 3.2 Cloth used for moon watching. Photograph Kreni Lokho

at the moon (Fig. 3.2). The white cloth has threads woven vertically and horizontally in a specific manner. The clothes are usually bartered from the Meiteis (an ethnic group of Manipur) or other neighbouring states such as Assam. The threads for weaving the shawls are traditionally made from the barks of the plants *Urtica dioica* L., *Girardinia diversifolia* (Link) Friis or *Hibiscus sabdariffa* L. Moon watching in the past was carried out by the community and village *movuo* themselves, or by a knowledgeable male elder of the community who would then relay the information to his calendar keeper. The practice has been abandoned since the introduction of the printed traditional calendar. However, some *movuo* are known to possess this clothing even today. Our knowledge partners said that these threads provided fine grids for observing the moon. However, the exact knowledge behind it was not revealed to us. This shows that though moon watching was not exclusive to the *movuo*, the holders of such knowledge attached certain levels of secrecy to it.

3.3.1.2 The Sacred Genna and Festivals of the Lunar Calendar

For the Mao Naga sacred holidays such as *genna*, festivals, prayers, thanksgiving, and offering are important occasions. *Genna* are sacred holidays stipulated by the lunar calendar during which the villagers abstain from physical work (Nepuni 2010). They were strictly followed in the olden days, and any failure to follow them by individuals was believed to bring misfortunes to the entire community. These *genna* have several species-specific and season-specific taboos attached to them. For example, planting

of *Euphorbia royleana* Boiss., *Erythrina stricta* Roxb., and *Erythrina variegata* L. is taboo during off-season, except *onu* (September). Violation of this taboo results in heavy rain and storm. Under such circumstances, people are asked by *movuo* or elders to uproot the plant. This taboo is observed till today. *Genna* such as *phehrü mani*, *dzükho mani*, *pfureshü mani*, *doshupirü mani* and *molu kosü mani* are followed mandatorily across religious barriers, as working in these days is considered a strong cultural taboo even today. Other *genna* may or may not be followed depending on individual beliefs. However, all festivals are celebrated today irrespective of the religious beliefs of the individuals.

Saleo (2011) lists 116 *genna*, while Nepuni listed 106 and 100 *genna* in 2010 and 2012, respectively. Eighty per cent of these *genna* are found to be similar to the dates and names of the 123 *genna* days recorded in this study. There are differences in the dates and misrepresentations of the *genna* as recollected by our knowledge partners. It appears that a considerable portion of the oral knowledge on the names, dates, rituals and other information on the *genna* has been eroded. Nepuni (2010) categorises *genna* into three, viz., *ora thini* (general holidays)—holidays observed by the whole Mao Naga community, *mopfuli thini* (yearly holidays)—holidays which occur throughout the year and *ohelai thini* (casual holidays)—holidays observed by an individual, family or by the whole village. We classify *genna* and festivals on the basis of usage, frequency and agricultural activities into six categories:

- i. Periodic *genna* (*okhroli thini*)—*genna* occurring every month.
- ii. Annual *genna* (*mopfuli thini*)—*genna* occurring once a year.
- iii. Seasonal *genna* (*chüsi ye chüleli thini*)—season specific, occurs once a year.
- iv. Casual *genna* (*oheli thini*)—unforeseen events; it can be at the level of individual, family or whole village.
- v. Unclassified *genna*—*genna* which do not fit into any of the above categories.
- vi. Festivals (*oni*)—mass celebration by the Mao Naga community.

According to our study, Mao Naga used to have 36 days of periodic *genna*, 43 days of annual *genna*, 8 days of seasonal *genna*, 19 days of unclassified *genna* and 17 days of festivals totalling to 123 days in a lunar year. The remaining 232 cannot be strictly defined as working days as there would be various casual *genna* occurring during this period. The list of various *genna* and the activities they govern are listed in Tables 3.2, 3.3, 3.4 and 3.5.

(i) **Periodic *genna***

Periodic *genna* occurs regularly every lunar month. Nepuni (2010) recorded five general holidays in a month, viz., *phehrü mani*, *ora mani*, *pfureshü mani*, *tokho mani* and *omi kazhü mani*. However, the author did not mention the dates of *phehrü mani* and *omi kazhü mani* in his monthly calendar. According to our knowledge partners, *ora mani*, *pfureshü mani* and *tokho mani* are the three prominent *genna* occurring every month. *Ora mani* usually falls on the third day of every lunar month and *pfureshü mani* between 4th and 10th day of every month while the occurrence of *tokho mani* varies from month to month. *Phehrü mani* is observed depending on the needs of the village such as the

Table 3.2 List of periodic *genna* and the beliefs/practices associated

Sl. No.	Name of <i>Genna</i>	Gregorian month	Associated beliefs/practices
1	<i>Ora mani</i>	No specific month	Prayers for long life and ease of suffering; offerings of eggs are made after crossing the village gate
2	<i>Pfureshü mani</i>	No specific month	Prayers to preserve food grains and wealth; taboo day for wild fruits consumption. People who do not follow this <i>genna</i> either over consume or waste food, leading to poverty and famine. When this <i>genna</i> is observed in September (<i>onu</i>), women go fishing in the paddy fields (<i>okho stü le</i>). When they return home, bachelors waiting at the village gate snatch the fish
3	<i>Tokho mani</i>	Throughout the year	Prayers for food (<i>tokho</i> from <i>to</i> denoting food; <i>kho</i> —to ask; <i>mani</i> —holiday)

pulling of memorial stones erected by ancestors, cutting trees meant for the village gate, hunting, war, etc. (Nepuni 2010; Saleo 2011). Hunting is usually carried out during the month of *khranü* (April) when the arrival of spring would bring thinner thickets with young shoots, which attracts herbivores. Besides, the thinner thickets also make it easier for the hunters to move. In the past, animals of all sorts were hunted including wild boar, deer, civet, monkeys and rarely bears. However, the Mao Council which has now assumed the role of the chief calendar keeper has recently advised the villagers not to promote hunting as the game count has been reduced below the optimal level. The only instance when *phehrü mani* is celebrated periodically is the first day *chüthuni* of the lunar new year. Likewise, *omi kazhü mani*—a *genna* to prevent fire is observed during the cold dry months of *okro* (December) to *khrana* (May) and not throughout the year. Table 3.2 lists the various periodic *genna* and the beliefs associated.

(ii) **Annual *genna*:**

Annual *genna* largely occurs once a year. There are 34 annual *genna* (Table 3.3).

(iii) **Seasonal *genna*:**

There are four season-specific *genna* (Table 3.4).

(iv) **Casual *genna***

Casual *genna* is results of unforeseen events such as the birth of a child, death in the family (the whole village abstains from work for a day while the family and relatives observe the *genna nobu* for 3 days). These *genna* could either be observed at the village level or confined to a single household. They are also called as *oheli theni*. Casual *genna* is also observed during the erection of memorial stones and village gate, construction of pond, preparation for war, feast of the affluent, natural calamities, etc.

Table 3.3 List of annual *genna* and the beliefs/practices associated

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
1	<i>Phehrü mani</i>	<i>Chiüthuni</i>	January	Day for praying and self-purification. Men bathe in a pond as a sign of washing off their sickness, misfortune, bad deeds, etc.
2	<i>Osü pukakha mani</i>	<i>Chiüsolopra</i>	February	<i>Osü</i> = millet; <i>pukha</i> = to stop. Day of rest after sowing of millets. Sowing of millets after this <i>genna</i> is taboo and it is believed to bring disaster to the millets. Lighting of fire and roasting in any form is prohibited on this day
3	<i>Lopra zho</i>	<i>Orolopra</i>	March	<i>Loprazho</i> is observed for three days when stone cenotaphs are pulled for <i>zhoso kosomei</i> (affluent families)
4	<i>Khrihu kashü mani</i>	<i>Orolopra</i>	March	Prayers to avert cyclonic rains and storms
5	<i>Ojü kathi mani</i>	<i>Khranü</i>	April	A day of rest for the soil. <i>Ojü</i> = earth; <i>kathi</i> = dead. Land is in a deep state of sleep. If any death occurs in the village, <i>genna</i> is postponed as the soil is disturbed for the burial

(continued)

(v) **Unclassified *genna***

Ongho sole and *ongho pa* occur more than once in the lunar calendar but cannot be considered as seasonal *genna* as they are not season specific (Table 3.5).

Table 3.3 (continued)

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
6	<i>Osü ra koso</i>	<i>Khrana</i>	May	Seeking protection of millets from pests and insects. Lighting of fire and roasting of food are prohibited as animals will be attracted by the warmth of the fire and rodents to the roasted food
7	<i>Ochü kozü mani</i>	<i>Khrana</i>	May	<i>Ochü</i> = sky; <i>kozü</i> = dark. Solar eclipse; planting of chilies on this day brings good harvest. However, the planter risks becoming blind due to the strong smell of chilies
8	<i>Thopreso kozhule</i>	<i>Pfozü</i>	May	Sharing meat for <i>thopre</i>
9	<i>Thopre</i>	<i>Pfozü</i>	June	Initiation of paddy cultivation by the village <i>movuo</i>
10	<i>Othe pei</i>	<i>Pfozü</i>	June	Uprooting rice seedlings for transplantation to wet terrace
11	<i>Thopre & thopre pa</i>	<i>Pfozü</i>	June	Two days of rest before paddy transplantation
12	<i>Movu ale</i>	<i>Pfozü</i>	June	A day of purification for <i>movuo</i> before paddy planting
13	<i>Ekrü le</i>	<i>Pfozü</i>	June	People forge or sharpen their tools required for rice cultivation
14	<i>Moso thole</i>	<i>Pfozü</i>	June	Prayers before the paddy plantation. End of restriction on harvesting and consumption of <i>Coix lacryma-jobi</i>

(continued)

Table 3.3 (continued)

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
15	<i>Ashu pfole or omora ashu</i>	<i>Sale</i>	July	Rituals involving <i>Rhus chinensis</i> branch. Prayers offered for prosperity. Children and men sing <i>ashe ashe ro, ashe ashe mokho re, oh! Kakra tho, oh! Kati tho, ahe vu-o</i> , meaning 'calling the god of spirits, inviting white and black paddy to come home'
16	<i>Kapeni sü pfüle</i>	<i>Sale</i>	July	Gather firewood for <i>saleni</i> festival
17	<i>Otupro</i>	<i>Sale</i>	July	Three days for gathering cattle fodder, and preparation for <i>saleni</i>
18	<i>Omo prakoho mani</i>	<i>Sale</i>	July	Prayers for the protection of paddy crop from pests and diseases
19	<i>Kathizho vule</i>	<i>Rolei</i>	July	A day of commemoration of those who died during previous <i>saleni</i>
20*	<i>Onira mani</i>	<i>Rolei</i>	July	Fowl set free in the jungle as an offering
21	<i>Okheshii mani</i>	<i>Rolei</i>	August	Prayers to protect paddy from insects and rodents; visitors and villagers not allowed to enter/leave villages; taboo to kill animals

(continued)

(vi) Festivals

All Mao Naga festivals are organised in the *mohru bu*, the common space where men discuss village welfare, learn traditional yells, folktales, folksongs, etc. (*mohru* = feasting; *bu* = place). The Mao Naga has two major festivals:

Table 3.3 (continued)

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
22	<i>Lijü vale</i>	<i>Onu</i>	September	Renovation of roads for easy paddy transport; a huge tree-like figure (<i>propa</i>) made from <i>Rhus chinensis</i> is erected on the roadside to repel insects and rodents
23	<i>Lijü kava tokho mani</i>	<i>Onu</i>	September	Prayer for food required for road renovation
24	<i>Tapha</i>	<i>Onu</i>	September	One or two days of <i>tapha</i> is observed; vegetables from the farm and jungle are gathered and stored prior to <i>tapha</i> . Vegetable foraging is not permitted during <i>tapha</i> . Foraging vegetables during <i>tapha</i> increases appetite and in turn, decreases wealth
25	<i>Motho kotho mani</i>	<i>Onu</i>	September	Restriction on the consumption of harvested paddy is lifted
26	<i>Lohozü</i>	<i>Onu</i>	September	Village <i>movuo</i> sacrifices a fowl and predicts the future in an all-male ritual called <i>osa kopfü</i>
27	<i>Nahri</i>	<i>Onu</i>	September	Day of rest
28	<i>Tuphe chiüno or out hobule</i>	<i>Onu</i>	September	Cattle are not allowed to graze outside. Cow owners not permitted to consume chilli

(continued)

Table 3.3 (continued)

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
29	<i>Khibodu kasha mani</i> or <i>khibodumani</i>	<i>Mazhalopfu</i>	October	Vegetables and fruits are harvested/gathered and stored with leaves of <i>Elsholtzia blanda</i> (<i>orakholo</i>) for fear of hailstorm and natural calamities. <i>E. blanda</i> is a moth-repellent, medicine and a magic potion to repel evil spirits
30	<i>Tobu koto</i>	<i>Belu</i>	November	Mothers from affluent families cook first rice from the barn and eat together with two cooked female crabs. It is believed that the rice barn does not deplete quickly
31	<i>Bepi apra or benghi padei kotho</i>	<i>Belu</i>	November	<i>Bepi apra</i> ends <i>tobu koto</i> . The barn seal is removed
32	<i>Molu Kosü mani</i>	<i>Okro</i>	December	Prayers to avert earthquakes. Working on this day causes frequent dizziness
33	<i>Mozümei oso dathale</i>	<i>Okro</i>	December	Slaughtering of pig and cow by the affluent (2 days)
34	<i>Omi koro kro</i>	<i>Okro</i>	December	Commemoration prayers for fire victims
35	<i>Shuzhü kro</i>	<i>Okro</i>	December	Commemoration prayers for those killed by enemies, wild animals, snakes, drowned or fallen from trees

(continued)

Table 3.3 (continued)

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
36	<i>Krojü</i>	<i>Okro</i>	December	Commemoration prayers for people who died due to natural causes. At night, a whole plant of <i>Rubus ellipticus</i> (<i>somoso shü</i>) is placed before the house entrance; leftover food not eaten on the next day

Table 3.4 List of seasonal *genna* and the beliefs/practices associated

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
1	<i>Chüthu pirü mani</i> and <i>dosu pirümani</i>	<i>Khranü & pfozü</i>	May and June	Two individual <i>genna</i> , to protect flowers and fruits from hailstorm; carrying of fodder and manure to fields and repairing of tools allowed. If a hailstorm falls during these <i>genna</i> , it is postponed to the next day. Violators lead the gods to bring hailstorm
2	<i>Dzükho mani</i>	<i>Pfozü & sale</i>	June and July	Prayers for monsoon for paddy plantation
3	<i>Ochü kazhü mani</i>	<i>Onu & mazhalopfu</i>	September and October	Prayers for favourable weather for harvesting
4	<i>Omi kazhü mani</i>	<i>Okro – khrana</i>	December to May	Prayers to avert fire accidents in village or forest (<i>omi</i> = fire, <i>kazhü</i> = good, <i>mani</i> = holiday). December to May remain cold and dry and fire on the forest floor is catastrophic. The burning of fire is prohibited in the fields. Violators encounter <i>chüro chüdi</i> (frequent fire destruction)

Table 3.5 List of unclassified *genna* and the beliefs/practices associated

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
1	<i>Ongho sole</i>	<i>Chüsolopra, orolopra, rolei and okro</i>	February, March, August and December	<i>Ongho sole</i> = initiation of work. Elders initiate agricultural activities; taboo for youngsters to report early for work (causes premature death). Elders not going to fields would resort to <i>ongho kokhu</i> (beating hollowed trees or dead wood outside the village to mimic working)
2	<i>Ongho pa</i>	<i>Chüsolopra, orolopra, rolei and okro</i>	February, March and August	<i>Ongho</i> = work, <i>pa</i> = twice. The saying <i>opa somoli, koro chükhu no nobi bidu tiwe</i> means 'do twice or else the village gate will cut off our ears'. Likewise, <i>ongho pa</i> is followed after <i>ongho sole</i> , as a repetition of <i>ongho sole</i>
3	<i>Movu mati kotho</i>	<i>Chüsolopra and orolopra</i>	February and March	Initiation of sowing by village <i>movuo</i> . <i>Oshiütho</i> (<i>Coix lacryma-jobi</i>) and <i>siüva</i> and <i>tomosü</i> (<i>Setaria italica</i> and <i>Pennisetum glaucum</i>) used to be sown in a symbolic ritual that initiated agricultural season. <i>Movuo</i> fasted until sunset. <i>Movu mati kotho</i> translates into 'the king's sowing'. After the <i>genna</i> , sowing of seeds is not taboo. Millets are cultivated only in smaller quantities today due to the prevalence of wetland paddy
4	<i>Mati kotho bamani</i>	<i>Chüsolopra and orolopra</i>	February	A day of rest after <i>movu mati kotho</i>

(continued)

Table 3.5 (continued)

Sl. No.	Name of <i>Genna</i>	Mao Naga calendar	Gregorian month	Associated beliefs/practices
5	<i>Zhongo mani</i>	<i>Chüsolopra</i> and <i>rolopra</i>	February and March	Housewarming ceremonies mostly by the affluent
6	<i>Ba mani</i>	<i>Orolopra</i> and <i>onu</i>	March and September	<i>Ba</i> = hands, <i>mani</i> = holiday or rest. The <i>genna</i> is observed after <i>movuo</i> sows first seeds
7	<i>Zhepe</i>	<i>Chüthuni</i> , <i>pfozü</i> and <i>sale</i>	January, June and July	<i>Movuo</i> asks villagers to begin rice beer brewing for upcoming festivals

chüthuni and *saleni*. Festival preparation begins on the day of *zhepe* when the village *movuo* instructs the villagers to start preparing the rice beer.

***Chüthuni* festival**

Chüthuni is also called the festival of dawn and is celebrated in the month of January for the six days of *nisha*, *nijü*, *oshu kope*, *onizho padei*, *onizho pongo* and *pfoki kapra*.

- *Nisha*: The beginning of the festival and initiation of rice beer consumption. In the evening, unleavened bread (*lore*) is baked and shared communally with rice beer around a bonfire.
- *Nijü*: The second day of the festival. A sacred ritual called *ora khekho* is held where food including portions of slaughtered animals is offered to the gods at dusk.
- *Oshu kope*: Third day of the festival when people bid farewell to guests. Daughters married off to other villages return home to receive a strip of meat and rice beer. Village men go to the jungle in the morning to catch birds with bare hands to prove their physical fitness and worth to society (Nepuni 2010).
- *Onizho padei* and *onizho pongo*: These two days are celebrated as a continuation of the festivals where people feast, dance, sing, tell stories and recall old memories. This practice is on the wane.
- *Pfoki kapra*: *Pfoki kapra* is a romantic festival when men climb hills with spinsters. Traditional yell, bursting of crackers, playing of games and traditional dances (*dekocho*) are performed. While returning, spinsters carry *kopenisü*, a bundle of firewood from *Schefflera* sp., cut by her suitor to the village. At dusk, communal feasting and drinking take place around a bonfire. This *genna* is in practice till date in most of the villages except Punanamei. It is said that once when Punanamei villagers went on such hill-climbing, a wild boar injured a person, resulting in the ending of the traditional yell which is a bad omen.

***Saleni* festival:**

Saleni is a sacred feast for men celebrated in the Gregorian month of July after the completion of the paddy planting. There are two local seasonal indicators for this festival: the flowering of *Mussaenda frondosa* L. locally called as *saleni pa* and the appearance of cicada called as *saleni vo*. In the past, the *movuo* received information on these local seasonal indicators and determined the dates of the festival by corroborating it with data from moon watching. At present, people still observe these indicators. However, they wait for the date stipulated in the printed Mao Naga calendar to celebrate the festival. According to our knowledge partners, since the adoption of the printed traditional calendar, the local seasonal indicators have always been observed in advance of the festival dates printed.

The celebration days of *saleni* are:

- *Machazü*: First day of the festival. Cows are slaughtered followed by communal sharing and feasting with rice beers.
- *Nijü*: Animals except cows are slaughtered. A ritual called *lidzö* is observed by the affluent. Water from a spring is gathered using a spoon of *Elsholtzia blanda* (Benth.) Benth. leaves in a bowl of two *biro nghu* (*Alocasia sp.*) leaves.
- *Oshu kope*: Third day of the festival where villagers bid farewell to guests. *Todu* (rice beer) and *sonü* (strip of meat) are given to the married daughters who come home for celebration.
- *Ale lepa*: Fourth day of *saleni* festival. *Ale lepa* follows the sighting of new moon. In the event of *Ale lepa* falling on the third of the following month (*rolei*/August), July (*sale*) would have only 29 days. If it falls on the second, then *sale* (July) would have 30 days.
- *Ale lejü*: Fifth and the last day of *saleni* festival. On this day, Mao Naga men take a morning bath in the village spring. Before the bath, their legs are tied together with *Saccharum spontaneum* L. which gets snapped while washing. This signifies letting go of hardships and pre-empting future problems.

Oni anü is celebrated for a day, 15 days after the festivals of *chüthuni* and *saleni*. There are also three minor festivals called *chüjüni*, *onuni* and *belu ni* which are celebrated for a day each. *Chüjüni* is celebrated just before the paddy plantation in the month of June (*pfozö*), when herdsmen are offered a meal and rice beer for their service. Hence, *chüjüni* is also called *tokhumei ni*—festival for herdsmen. After this festival, planting of paddy is not a taboo anymore. According to Nepuni (2010), *onuni* is celebrated in the month of *onu* (September) to commemorate the harvest of fruits and other crops. *Belu ni* is celebrated for two days in the month of *belu* (November). On the second day, women wake up early in the morning and sprinkle water on the rice barn (*lidzö*).

3.3.2 The Solar Calendar

The Mao Naga kept track of the position of the sun, as the position of sunrise and sunset differ due to the inclination of the earth's rotation around its axis (Ros 2019). The community used to have an elaborate solar calendar that was later replaced by the Gregorian calendar as they gradually converted to Christianity. The Mao Naga in the past employed 'horizon sun watching', the art of observing the position of the sun relative to the mountains on the horizon to predict the onset of the seasons. The *movuo* received information on the position of the sunrise from 'horizon sun watchers' who regularly observed the sunrise from a particular spot in relation to a prominent mountain (Fig. 3.3). There was no dedicated sun watcher, and any elder could act as the sun watcher, and relay the information to the *movuo*. Sun watching helped to predict the four seasons (spring, summer, autumn and winter) which was important to ensure food security for the community.

It was a taboo in the Mao Naga community for youngsters to perform sun watching. By ensuring that sun watching was undertaken only by knowledgeable and experienced elders, the segmental taboo guaranteed that data from sun watching was error-free. In this connection, dreaming of sunrise, mid-day and sunset is believed to have both good and bad elements. As per our knowledge partners, people who dream about sunrise and mid-day do not live long, contrary to the people who dream about sunsets. Dreaming about sunrise and mid-day is characteristic of lazy people who do not engage in work, resulting in poverty that in turn cut shortens her/his life. Here, dreaming about sunrise/mid-day is considered analogous to sleeping during sunrise and mid-day. Horizon sun watching has become extinct, along with the segmental taboo on it. However, the belief connected to dreaming about sunrise and mid-day is prevalent even today.

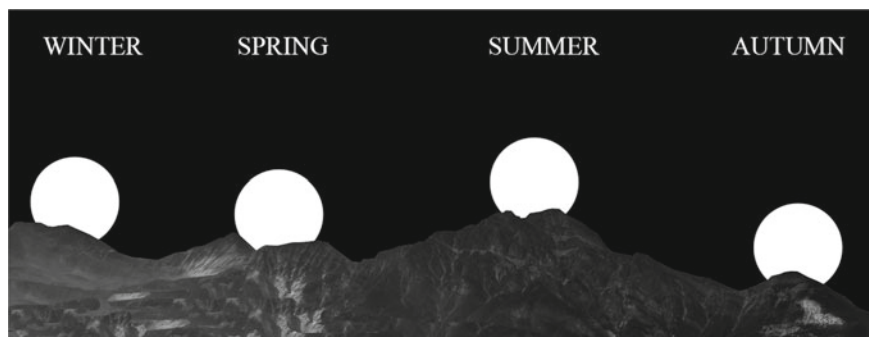


Fig. 3.3 Graphical representation of the changing relative position of sunrise according to the four seasons

3.3.3 *Local Seasonal Indicators: Calendar Plants and Animals*

The lunar and solar calendars depend on their respective celestial bodies. The timing determined by lunar and solar calendars is further made relevant at the landscape level by triangulating it with phenological data from calendar plants and animals. These local seasonal indicators help to maintain the Mao Naga ecological calendar relevant to the landscape even today, which is important to perform agricultural and other landscape management activities. Examples of local seasonal indicators are: the blooming of *Bombax ceiba* L. marks the onset of spring; the flowering of *Pyrus pashia* Buch.-Ham. ex D.Don signals the time for broadcasting paddy seeds on uplands; the flowering of *Bauhinia purpurea* L. and *Prunus persica* (L.) Batsch marks the timing for planting vegetable saplings and maize in the swidden fields; the flowering of *Hedychium coccineum* Buch.-Ham. ex Sm. marks the timing for transplantation of paddy seedling; the blowing down of wind from the top of a hill to the valley, and the singing of house crickets (*Acheta domesticus*) mark the onset of winter months; the flowering of *Mussaenda frondosa* L., and the appearance of cicada indicate the timing for *saleni vo* festival, which in turn signal the end of paddy planting.

3.3.4 *Movuo, the Calendar Keeper*

The term *movuo* is equivalent to the term ‘king’ and is hereditary in nature. In the Mao Naga community, it is the *movuo* who act as calendar keepers. The chief *movuo* in the past donned the role of calendar keeper, processing and superimposing data on phenology of plant, insects and birds over the solar and lunar cycles. He thus determined the festivals and rituals that governed community actions. The chief *movuo* acted as the primary calendar keeper by disseminating information on *genna* by yelling it to the community and other village-level *movuo* from the top of a little mound. The *movuo* of the neighbouring villages who picked it up relayed it further by yelling from the top of their own mounds. Messengers were also involved to relay information to distant villages where information could not be reached by mere yelling. These messengers were dispatched before the day of the *genna* for uniformity in observance.

Prior to the British colonial period, the *movuo* of Pudunamei village acted as the chief calendar keeper. He is still the chief *movuo*, but without the hereditary authority. In Pudunamei, the customary mound used by the chief *movuo* to shout the calendric information meant for the entire community is still present (Fig. 3.4). A smaller mound (Fig. 3.5) is also available in the same village which is used even today for shouting calendric information exclusively meant for the inhabitants of Pudunamei. It was common for certain villages/chiefs not to accept the leadership of the chief *movuo* and assert sovereignty over their village. Likewise, the village



Fig. 3.4 Customary mound at Pudunamei village once used by the chief *movuo* to shout calendric information to the entire Mao Naga community. Photograph Kreni Lokho

movuo were also at liberty to adjust the dates of the festivals and *genna* according to their own observation of local seasonal indicators and the moon. In the Mao Naga folk history, there are no records of female *movuo*, underlining the patriarchal nature of the institution of *movuo*. According to Nepuni (2010) and Chachei (2010), the role of *movuo* is to administer and officiate social matters and initiate rituals, ceremonies and festivals connected to the Mao Naga religion. At present, the Mao Council has established itself as the supreme authority due to the decline of the institution of chief *movuo*. The chief *movuo* was generally reputed for his valour, diplomatic capabilities (dispute settlement) and oratorical skills. The chief *movuo* also offers prayers for the prosperity of his people, and initiates the sowing of seeds, paddy plantation as well as the first harvest. Even today, the chief *movuo* initiates sowing and harvesting of paddy and offers rituals during paddy plantation by pouring rice beer on a banana leaf.

The village *movuo* are supported by elders known as *hodzū movuo*, and affluent families known as ‘*zhoso koso mei*’ or ‘*omozū mei*’ or ‘*orareiso koso mei*’, who are identified by their unique shawls. These elders also share the knowledge on calendars. The title of *hodzū movuo* is hereditary. They receive a piece of land in the village called *movuo pfū* (*pfū* means dwelling). The number of *hodzū movuo* differs from village to village and any form of information about *genna*, rituals, war and other administrative works are passed down from the *hodzū* to the members of the clan. This oral tradition leads to the transmission of calendric knowledge between *hodzū movuo* and the villagers. The proficiency of the elders of today in folksongs, folktales, *genna*, rituals and position of the sun could all be attributed to this vertical transmission of knowledge. *Hodzū movuo* are also adept in ensuring the secrets remain concealed.



Fig. 3.5 Smaller customary mound at Pudunamei village still used by the *movuo* to shout calendric information to the villagers of Pudunamei. Photograph Kreni Lokho

3.3.5 *The Calendar Keeper and His Importance in Landscape Management*

The role of *movuo* is a highly venerated one. According to a Mao Naga folk story, there was a time when the Mao Naga community disliked the rituals of a village chief and banished him—a costly mistake that brought seven years of famine to the village. The famine forced the elders to request the chief to return. The chief refused, and the desperate villagers resorted to tying him up and carrying him back to the village. However, they had little success in pacifying him to share vital calendric information. The villagers then resorted to scouting around for calendric knowledge. A nursing mother who was rocking her child to sleep, noticed the elders moving aimlessly around the village and took pity on them. However, as a woman, she was prohibited from sharing the calendric knowledge. So she sang all the knowledge she had on the agriculture and seasons as a lullaby which led to the ending of the famine (see Mao and Hynniewta 2011).

According to another version of the story, there was a dreadful famine that lasted for seven years. The villagers then dispatched a spy to the neighbouring village to secure calendric information related to agriculture. In those days, women who were married off to other villages were also used as channels of communication. The spy failed to infiltrate the heavily fortified village and had to hide in the outskirts until he could meet his sister. Finally, when his sister found him, she feared that their interaction could be noticed. So she pinched her child and sang her calendric knowledge in the form of a lullaby. There are also other variations of the story. However, the elements of famine, search for a calendar, refusal of information from the other and the nursing mother are all common themes portrayed in all the folklores. Following is an excerpt from the lullaby that is sung even today.

Hoyi ho, howa ho,

(Non-lexical vocables)

Chütepa ti pali, mati tijü thowe

When *Pyrus pashia* flowers, seeds are sown (swidden)

Hoyi ho, howa ho,

Pfovapa pali mati thowe

When *Bauhinia purpurea* flowers, seeds are sown

Hoyi ho, howa ho,

Livopa ti pali, mati thowe,

When *Prunus persica* flowers, seeds are sown

Hoyi ho, howa ho

Five distinct observations can be made from these folklores: (i) The *movuo* is the official calendar keeper, without whom agriculture is impossible, (ii) although the Mao Naga society is largely patriarchal, the folklores indicate that women are the storehouse of important TK on time and seasons. While the menfolk are mostly busy with war and security of the village, it is the women who take up agricultural

works to keep the hearth burning, (iii) The community had lost a large portion of its calendric knowledge and whatever remained was acquired from the mother and (iv) famines are not entirely a weather-related disaster, but could also result from the loss of traditional calendric knowledge. The TK of Mao Naga is being lost rapidly and the trend is expected to continue as numerous folklores are incomplete like the lullaby mentioned above. Our knowledge holders attribute factors such as acculturation due to change in religious beliefs (embracing of Christianity), and vacillation within Mao Naga community as the primary reasons for the loss of TK. Nepuni's study in 2010 is also of the same opinion. The chief *movuo* has a sacred paddy field given by the villagers called as *chüna do* where the rituals for initiation of sowing and harvest are done (Fig. 3.6). Such sacred fields are common in agricultural communities with dedicated calendar keepers. For example, the Kanekes (Baduy) people of Banten, Indonesia are known to maintain sacred fields known as *huma serang* where rice is planted first by the *puun* (shaman) (Iskandar and Iskandar 2016). Traditionally, people used to give a small basket of rice or millets to the chief *movuo* for sowing. This practice which could have been an exercise to verify the viability of seeds is not prevalent anymore, further indicating the erosion of the importance of the calendar keeper.



Fig. 3.6 Photograph of *chüna do*, the sacred paddy field of the chief *movuo*. Photograph Kreni Lokho

3.3.6 *The Mao Naga Calendar Today*

According to Nepuni (2010), the Christian doctrine introduced by the British was resisted by the *movuo*, resulting in the banishment of early Mao Naga Christians. A case (Case No. 343, 1928 Hill case) was registered against the Christians for singing during *genna* days. A decree was issued by the government that Christians should be allowed to stay in the village, as long as they followed seven important *genna*, namely, *omi kazhü mani* (avert fire), *okheshü mani* (avert pests, insects, rodents and parasites), *ojü kathi mani* (avoid disturbance of soil to induce fertility), *phehriü mani* (self-purification), *movuo mati kotho* (sowing of seeds by *movuo*), *motho kotho mani* (end of restriction on consumption of harvest) and *chüjü ra* (eradication of human-related diseases) (Mao Baptist Churches Association 2002). Today, all of these *genna* except *okheshü mani* and *phehriü mani* are observed. The *movuo* continue to initiate paddy sowing (*movuo mati kotho*), paddy planting (*movuo thopre*) and harvest. The Mao Council that has assumed the role of chief *movuo* publishes the annual lunar calendar in printed form. The council collaborates with all village chiefs (village *movuo*) and directs them to follow common festival days as stipulated by the printed calendar. The printed traditional calendar has its own advantages and disadvantages. Advantages include (i) The lunar and solar calendars are available for ready reference for the community. This in turn ensures that the prevailing *genna* and festivals are followed without fail. (ii) It has triggered a renewed interest among the new generation on the *genna* and associated cultural practices. Disadvantages include (i) A village-level authority (village council) is set up in each village to administer and supervise the administration and other activities of the calendar. This undermines the authority of the village *movuo*, and reduces his power as the calendar keeper. (ii) It catalyses the loss of the institution of calendar keeper along with the associated body of knowledge, as no individual is involved in collecting, and interpreting and disbursing information on local seasonal indicators. (iii) It does not provide information on local seasonal indicators, a vital component of the Mao Naga calendar. (iv) The printed calendar provides only the dates of festivals and months but deliberately withholds the dates of sacred holidays (*genna*). This obscures the diversity of cultural practices (folklore, myths and beliefs system) associated with the calendar, rendering it a homogenous and static.

3.3.7 *Mapping the Flow of Calendric Information*

Prior to the British colonial period, calendric information used to be announced by the chief *movuo* who hailed from Pudunamei village, and the information was relayed from village to village by the respective *movuo* through yelling. For distant villages, a random person chosen as an informant was sent to pass on the message. Our structured interviews give an idea of people-to-people transmission of calendric information that occurred in the years 2016–2018. A majority of the respondents

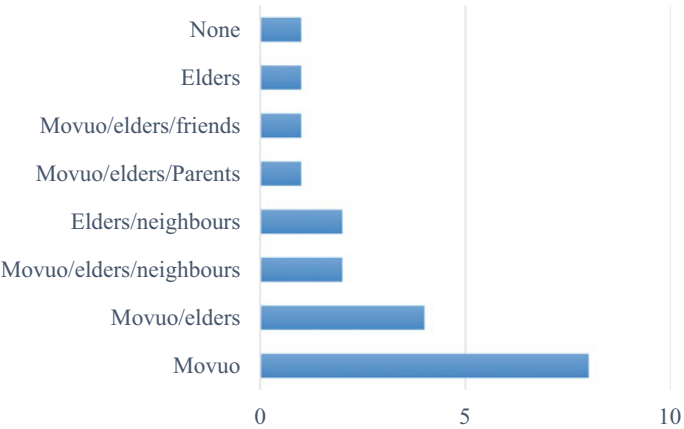


Fig. 3.7 Individuals from whom calendric information was received in 2016 and 2017

(80%) depended on *movuo* for receiving calendric information (Fig. 3.7). Elders rank next as the source of calendric information. The lone participant who reported that he received no information was the late *movuo* of Shajouba village himself. This shows that the calendar keeper is the keystone figure from whom processed calendric information continues to originate and flow to the community members. The lead author’s observation also shows that transmission of information is dependent on the distance between the participant’s house and the little mound from where the *movuo* announces the *genna*. Respondents who were distant received the information via elders, neighbours, parents, etc.

The people-to-people transmission of calendric information at present is village-centric (Figs. 3.7 and 3.8). Children, neighbours, friends and family are the main receivers of calendric information. Four respondents (25%) did not favour specific recipients, and their choices of recipients are general. All the recipients of the calendric information were from the village itself. This shows that for sovereign villages not affiliated to a community *movuo*, the flow of calendric information remains within

Fig. 3.8 Individuals to whom calendric information was passed during 2016 and 2017

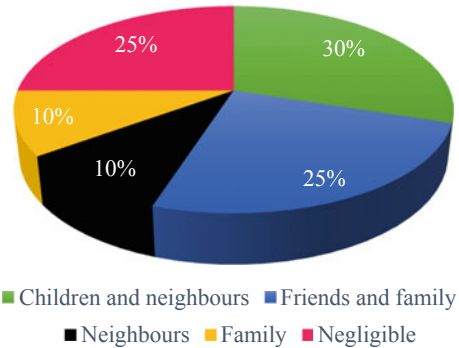
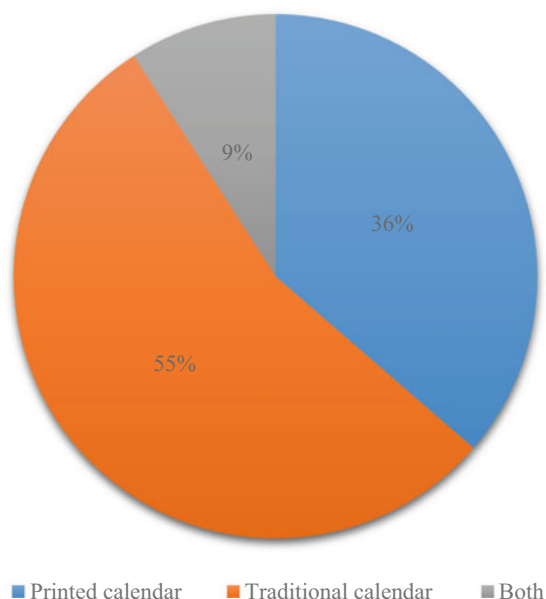


Fig. 3.9 People's preference for traditional and printed calendars



the boundaries of the village even today. As discussed earlier, this secretive nature of the information helped the village during days of tribal wars, and intra-village secrecy is still maintained.

Although the printed lunar calendar disbursed by the Mao Council may be a decade old, in July 2018, a customary law was passed to ensure that all Mao Naga villages follow the printed calendar for a common calendar time. Yet, our study shows 12 respondents were in favour of the traditional lunar calendar administered by a *movuo* (Fig. 3.9). The probability of accepting printed calendar was found to be higher with the formally literate people than those who learned from the traditional informal ways. The printed calendar lacks dynamic information on the role of *movuo*, the village-level *genna*, rituals and folklores, ethnoecology, taboos, construction of houses or mass digging of paddy field or pond, erection of stones, local seasonal indicators (calendric plants, birds, insects and animals), hunting period, gathering of non-timber forest products (NTFPs), etc. Most of these activities mentioned above are time specific. A wise *movuo* can still practise and administer the traditional dynamic calendar along with the printed calendar. However, the diktat of the council to use printed calendar reduces people's dependency on *movuo* which in turn leads to loss of respect to the already weakened institution of calendar keepers. Another notable issue is the acceptance of *movuo* by the people; *movuo* are followers of the traditional Mao Naga religion, which puts them in direct conflict with the Christian doctrine. Some *movuo* have discontinued the rituals following their conversion to Christianity. Even though the Mao Naga had earlier fought against the imposition of Christian doctrine, the Mao Naga beliefs have constantly been denigrated leading to acculturation. However, our observation shows that the Catholic Church and its

followers are more lenient towards the observation of *genna*, unlike the evangelical Protestants who form the majority and thus are able to enforce their will.

3.4 Discussion

3.4.1 *Traditional Ecological Calendars Facilitate Landscape Management*

Landscape management is both a spatial and temporal process. Yet, the temporality of the process has largely been neglected in conservation and ecology (Burgman et al. 2005). Agricultural communities construct ritualistic landscapes over the landscape (Khattari 2003). In such communities, the ritualistic landscape depends on the agricultural lands, crop patterns and rituals conducted. Traditional ecological calendars provide a culturally validated framework to link the ritualistic landscape with the landscape. They help the communities to plan, organise and execute their ecological, spiritual and cultural activities over time on the landscape (Franco 2015; Prober et al. 2011). Phases and positions of the sun, moon, and constellations, festivals, rituals, and local seasonal indicators are all temporal landmarks that help in determining the timing and duration of events that include landscape management activities such as agriculture, hunting, forest clearing, and fishing (Ammarell 1988; Gupta 2010; Sinha 2019). In the past (Sect. 3.3.1), the Mao Naga ecological calendar attached taboos to the month of *onu* to ensure food security, as well as to pool in human resources for facilitating agricultural activities. Local seasonal indicators (Sect. 3.3.3) signal the change of seasons, the arrival of months, the timing for undertaking paddy cultivation both in upland and wetlands, as well as the completion of the harvest. In the absence of this component, the calendar would have been highly centralised, precise, and rigid as it depends on the regular recurrence of lunar and solar events. Local seasonal indicators are capable of occurring early or late, depending on the environmental conditions prevailing at any given point of time. They thus introduce flexibility to the ecological calendar and landscape management practices which helps the community to adapt to changes in the landscape, especially fluctuations in the availability of resources resulting from climate change (Armatas et al. 2016; Savo et al. 2016).

The extant *genna* and festivals stipulated by the calendar determine when the Mao Naga would undertake landscape management activities, and other social events: *phehrü mani* is observed before the hunting party sets out for hunting even today; *chujuni* festival marks the onset of paddy planting season; *onuni* festival initiates the harvest of fruits and non-paddy crops. *Omi kashü mani*, the *genna* for averting fires reminds the community to be guarded against forest fires. It ensures that the community undertake measures to prevent fire (Table 3.4). Scot (1908: 240) describes the agricultural system of Land Dayaks of Borneo as ‘a supernaturally protected process with constant festal interruptions’, highlighting the power of rituals in protecting agriculture. However, we know today that such temporal landmarks are important for the

sustenance of agricultural activities, and agrobiodiversity (Pfeiffer et al. 2006; Sinha 2019). The deployment of calendric festivals and rituals to stimulate or terminate landscape management activities has been known from the well-studied calendars such as those of the Nahuatl and Mayan people (Franco 2015; Klein 1993; Milbrath 1997). The Mao Naga calendar links the ritual landscape with activities on the landscape, thus playing a decisive role in the landscape management activities of the community.

3.4.2 *Calendar Keepers, the Unsung Heroes in Indigenous Landscape Management*

Shamans have been recognised for the multiple roles they play in a community. They practise techniques and activities that help them acquire, use and transmit knowledge that is usually not accessible to the average community member (Krippner 2002). They are the interpreters and safe-keepers of the community's beliefs and traditions (Steadman and Palmer 1994). They are also healers who effect healing by combining remedies from the spiritual realms with those of the physical world such as herbs and minerals (Greene 1998). In most communities, shamans are also the calendar keepers who possess calendric knowledge, along with knowledge on rituals, ceremonies and healing (Marshack 1985; Meggitt 1958). Rice (2007: 49–55) hypothesises that in ancient egalitarian communities of Mesoamerica, the shamans played a quintessential role in leading wars and planning hunting expeditions. With the advance in time, such individuals later rose to the position of calendar keepers, a position that was crucial in reinforcing the power of chieftains, and the subsequent formation of governments. In the case of Mao Naga, we see that the position of *movuo* is a culmination of all these powers hypothesised by Rice.

Although the knowledge on the Mao Naga calendar and calendric rituals in the past was fairly disbursed throughout the community, the chief *movuo* acted as the primary calendar keeper with Shamanic powers. His authority as the traditional chieftain, and the rituals he performed added authority to the calendric information disbursed by him, thereby rendering it acceptable for the community. These findings are in line with the role of calendar keepers described by Gell (1992: 307). Rice (2007) refers to the sun watchers of Mesoamerican calendars as 'day keepers', who played an important role in calendar keeping. Like the horizon sun watching practised by the Mao Naga, communities such as the Hopi tribe of America, and Ngas of Nigeria practised 'horizon moon watching', where the position of the moon against a landmark was used for calendrical calculations (Holbrook 2016; Zeilik 1986). Moustache shaped archaeological remains excavated in the Chelyabinsk Oblast of Russia shows that such structures were used by keepers of time to accurately determine timings for sunset, sunrise and also forecast lunar and solar eclipses in 500 BC (Kirillov and Kirillova 2016). In the present scenario, the community lacks a chief calendar keeper,

and the village *movuo* emerges as the chief custodian of calendric knowledge inaccessible to those relying on the printed traditional calendar. This is understandable from the mapping of the flow of calendric information described in Sect. 3.3.7.

The *movuo* as the calendar keeper is the chief custodian of traditional knowledge related to landscape management. Using the lunar calendar, the *movuo* determines the timing and duration of rituals and festivals, so as to facilitate collective actions of the community over the Mao Naga's landscape. According to Leach (1950), a standalone lunar calendar would be of scarce value to the respective community, unless there is a mechanism to harmonise the lunar calendar with the solar one. The task of harmonising lunar and solar calendars was played to perfection in the past by the chief *movuo*. The Mao Naga community indeed recognises the importance of calendar keepers, as understood from their folklores. Folklores are capable of communicating the importance of extinct cultural elements of the landscape (Preston and Harcourt 2009). As singers of lullabies, women transmit 'secrets, senses, emotions, etc.' connected to the community's societal norms and history. This in turn influences social relations in the community (Bilal and de la Bretèque 2013; Metzger 1984). The Mao Naga folk tales of which the lullabies form a part of (Sect. 3.3.5) recognise that a considerable portion of calendric knowledge is also known to the women folk who do not explicitly participate in calendar-related activities. These folklores venerate the *movuo* as the calendar keeper without whom undertaking agricultural activities to achieve food security is impossible for the community. It is high time that the academic community and practitioners also take note of the importance of calendar keepers.

3.4.3 *Clash of Beliefs Explains Flattening of the Dynamic Calendar*

The Mao Naga calendar keeper diligently harmonised the lunar calendar with the solar calendar by introducing the intercalary month. Errors on calculating the first day of the lunar month were culturally tolerated owing to the flexibility they brought in, and also for their ability to keep the calendar relevant to the landscape (Sects. 3.3.1 and 3.3.3). This shows that the community trusted the calendar keepers for their ability to harmonise the solar and lunar calendars when the appropriate time arrived. Calendrical errors and rectification actions are not uncommon in the history of the humankind. However, calendric errors in classical calendars were identified and eliminated. This is understandable as the mandate of such calendars were not to be locale and community specific but to control the actions of multiple communities living across multiple landscapes. For instance, the introduction of the Gregorian calendar following the decree of Pope Gregory XIII in 1582 resulted in the removal of 10 days from October 5 to October 14 in 1582. This was done to account for the error of ten days the Julian calendar had accumulated by then (Augustyn et al. 2018;

Plumer 2016). Later, when Britain switched over to the Gregorian calendar in 1752, 11 days were removed from the month of September 1752 (Hartson 2017).

The Mao Naga once venerated calendar keepers for their ability to process and disseminate calendric knowledge related to landscape management, rituals and festivals. The loss of the cultural importance of calendar keepers goes hand in hand with the loss of cultural importance of the sacred holidays (*genna*). These stem from the shifting of religious beliefs from the Mao Naga religion to Protestant Christianity which condemns Mao Naga religion and associated beliefs as paganism or idolatry (Harari 2014). On and Pugh-Kitingan (2015) record similar experience of the Dusun community in Sabah, Malaysia. Here too, change in religious values eroded the cultural status of the community's traditional priestesses, eventually leading to the loss of beliefs and rituals associated with agriculture and traditional healing. The treatment of the pagans by the Romans via persecution, prohibition and destruction of literature, temples, statues, etc. (Kirsch 2005; MacMullen 1997), or the trials and executions of witches in many parts of Europe (Lennersand 2004; Toivo 2004), are all reminders of the constant fight waged by organised religion against folk beliefs, which has caused the irrevocable loss of indigenous religions, cultural practices, and traditional knowledge.

Of the 123 *genna* (sacred holidays) recorded by us, only *phehrü mani*, *dzükhö mani*, *pfureshü mani*, *doshupirü mani*, *molu kosü mani*, and festivals are practised across the community today. The Mao Naga solar calendar was replaced by the Gregorian calendar in the nineteenth century with the introduction of Christianity, eliminating the need for horizon sun watching and complex calculations associated with the process (Sect. 3.3.2). The recent introduction of printed traditional calendar further eliminates the need for moon watching (Sect. 3.3.1.1). Indeed, TK and cultural practices are not static and archaic, but constantly evolving through innovation and techniques (Berkes et al. 2000; Hastuti and Sumarmi 2017; Narasimhan and Franco 2009; Sunder 2006). However, the printed calendar withholds information on the sacred holidays (*genna*) rooted in the Mao Naga religion. It also lacks information on local seasonal indicators used by the calendar keepers to keep the calendar dynamic, flexible and relevant to the landscape (Sect. 3.3.6). Despite such shortcomings, there are positive signs on the ability of the printed calendar and its chief keepers—the Mao Council—to mimic the chief *movuo* in adapting calendric rituals and practices according to changes in the landscape. The Mao Council advising a halt on the practice of traditional seasonal hunting, taking into account the scarcity of game is an example of this (Sect. 3.3.1.2).

Pictorial calendars are records of the cultural, social and climatic events of the past (Graber 2017; Greene 2009). Neo-traditional measures such as the introduction of printed traditional calendar are known to enhance resilience capacity (Begossi 2000). For the printed calendar to metamorphose into an ideal calendar, it will have to reflect the dynamic nature of the Mao Naga ecological calendar. Including information on all *genna* and seasonal indicators would be the first step towards it.

3.5 Conclusion

The Mao Naga traditional ecological calendar enables the community to manage their landscape, and practise appropriate agriculture. However, its cultural importance has been lost gradually with acculturation due to the change in religious beliefs of the community. The community's lunar calendar employs 123 sacred holidays to regulate community activities. Yet, very few *genna* are adhered to these days, indicating the waning importance of the calendar. The Mao Naga folklores highlight the importance of calendric knowledge, the calendar keepers and the role of women in maintaining TK and food security. These folklores are reminders for the community to conserve the calendar and the institution of calendar keeping. In this context, the printed traditional calendars brought out by the Mao Council are a step in the right direction. Nevertheless, for the ecological calendar and the associated dynamic TK on landscape management to be holistically conserved, the community will have to strengthen the institution of calendar keepers, restore the flow of calendric information in the community, and ensure that the printed traditional calendar documents all *genna* and seasonal indicators. We recommend that such a well-documented calendar be administered by the calendar keepers themselves.

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