

Indigenous Knowledge Strategies for Food Security during Health Disasters: The Case of Cordillera Administrative Region, Philippines

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Food insecurity is a prevalent challenge faced by communities across various landscapes and regions around the globe during health disasters such as epidemics and pandemics. The study seeks to examine the indigenous knowledge strategies utilized by indigenous peoples to maintain food security during disasters. Utilizing a qualitative narrative inquiry approach, this study gathers information from the council of elders, barangay officials and community members. The Indigenous Peoples have long relied on the agamang system, or use of rice granaries to ensure food security during health and natural disasters, and community ceremonies. Each family maintains its own rice granaries to store their harvests following the tradition of their ancestors to never completely empty the content of the rice granary. This indigenous practice ensures a yearlong food reserves, with the current year's harvest intended for consumption in the following year. Additionally, the Gawat system which involves loaning of rice grains to affected relatives to prolonged impacts of disasters, remains an active practice by the Indigenous Peoples. This traditional knowledge, rooted in the practices of the indigenous peoples that date back time immemorial, continue to thrive today despite the challenges posed by urban migration, modernization, urbanization, and introduction of cash economy. This localized knowledge contains crucial information that can be adopted by rice farming communities, government agencies like Department of Agriculture and Disaster Risk Reduction Management to ensure food security during health or natural disasters.

Keywords: Food Security, Indigenous Knowledge Strategies, Agamang and gawat system, Health disaster

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INTRODUCTION

Indigenous Peoples across the globe have long relied on traditional strategies to secure food sovereignty and food security, practices deeply

rooted in their cultural heritage and ecological knowledge. According to the 1996 World Food Summit, food security exists when “all people, at all times, have physical and economic access to

sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” In contrast, food sovereignty is broadly defined as the right of local communities to control their own food systems including markets, ecological resources, food cultures, and modes of production ensuring that food systems remain culturally appropriate, sustainable, and community-driven (Wittman, 2011).

For the Indigenous Peoples, food security is necessary not only for health, but also for maintaining relationships with the land, resources, values and social organization, and for identification with indigenous culture, including culturally appropriate food (FAO, 2009b). For example, in the Cordillera, the Igorots' worldview is central to the intricate relationship of the land and the people. The adage, ‘land is life’ means the land serves as the space where they grow their foods that sustain them since time immemorial, their cultural practices, health and well-being and customary laws are all connected to the land for food security amidst natural disasters or external forces. Specifically, the use of agamang rice granaries is common as an indigenous strategy to secure food security of the family, clan and the community through generations.

The Agamang system is a traditional community-based food storage and sharing practice among Indigenous groups in the Cordillera Administrative Region (CAR) of the Philippines. It functions as a collective granary or food bank, where surplus harvests are stored and later used during emergencies such as natural disasters (typhoons, landslides and flash floods), and community rituals. This system is deeply tied to indigenous governance, reciprocity, and cultural values, making it both a food security mechanism and a social cohesion tool. The term “agamang” is commonly used in the Cordillera like the municipality of Sadanga, Sagada, and Besao in Mountain Province, and Tingguans of Abra while other municipalities call it “alang”. Different terminologies are used in the region but the

function is the same for storage of rice, root crops, and legumes for food security. Except for the Ifugaos, where they call the agamang as the sleeping quarter of the unmarried boys and girls, and the alang as the rice granary (Scott, 1962; Lambrecht, 1955).

Historical accounts show that rice granaries are tied to the way of life of the indigenous Peoples in the rice farming communities. In the study of Henry Scott (1962), he mentioned the presence of rice granaries in the Cordillera,

“The Ifugao granary is a smaller version of the traditional Ifugao house, modified only in that the wall-boards are continued up to make a tight junction with the roof. The same general design has been rendered completely rat-proof throughout much of the rest of the province by completing the roof with planks, as is to be found at the “heart” of the Sagada innagamang-style house. Other types of agamang can be found as far as Abra and Kalinga. The Tingguians of Abra and Isneg of Apayao, a type whose sawali walls flare outwards in an arc of increasing intensity to present the graceful curve of their Indonesian counterparts, a surface difficult or impossible for rats to climb, and no small trouble in construction.”

The Indigenous Peoples groups mentioned by Scott are the Igorot indigenous groups residing in the province of Abra, Apayao, Ifugao, and Mt. Province in the Cordillera Region.

The study of Backian (2016) also revealed that storage structures of some of the Indigenous Peoples are principally for rice harvest but are also used for prolonged storage of root crops such as taro, sweet potatoes and yams. Harvested roots and tubers of greater yam, lesser yam, tannia, arrowroot, canna and yacon can be stored for four to six months without serious losses at ambient temperatures. However, the roots and tubers must be washed, cleaned, air-dried and kept in shaded area within the house (e.g. in the rice granary-kamalig, agamang, donglong, in a wooden bin or in a pit under the house or under the shade then

covered or mulched with dried grasses, banana leaves or sacks. In other parts of Asia and Africa, freshly harvested tubers are packed in ashes and covered with soil or simply covered with little soil and grass mulch. Yams may also be stored in silos, i.e., hollowed out pits in the ground or in barns specifically constructed for yam storage (Lancaster & Coursey, 1984). Storage practices of the Indigenous Peoples is an indigenous strategy for food security.

For the Bugkalot Indigenous Group of Quirino Province they have a specially designed shack for

Figure 1 Ifugao Inspired Alang in Barangay Jose Ancheta, Madella, Quirino Province



storing harvested rice grains called an agang. Harvested seeds are dried for 2–3 days before being stored in the traditional storage shack or alang. The Ifugao that have migrated into the province have brought with them their Traditional Rice Varieties (TRVs) to ensure their continued availability for food as well as for practice of cultural traditions. It was chosen over the traditional Ifugao alang in order for the structure to withstand the strong winds that the community often experiences (Sister et al., 2022).

Studies also show the significance of rice granaries in securing food security in the Cordillera. The structure, design and materials used in the construction of the rice granaries played a significant factor so that the rice, root crops stored will not be spoiled and eaten by insects. Magcale-Macandog (2005) mentioned in their study in Bayyo, Bontoc, Mt. Province, their Abang (traditional rice storage) are constructed from materials like wood, bamboo, and thatch. This storage system not only protects rice from pests, moisture, and environmental fluctuations but also creates conditions that preserve essential nutrients. Beyond its nutritional benefits the Abang system significantly contributes to household food security. Families utilizing Abang granaries report

higher food self-sufficiency during the rainy season than households that rely on purchased commercial rice. This is because the Abang allows rice to be stored safely for extended periods, providing a reliable food supply during times of scarcity. This demonstrates that traditional granary systems like the Abang are not only nutritionally beneficial and supportive of food security but also contribute to sustainable agriculture and preservation of genetic diversity in indigenous rice varieties.

The longevity of the Alang/ agamang is associated with how the structures were carefully designed, and the materials used in building the rice granaries. Camacho et al. (2015) mentioned that the longevity of an Alang (80-100 years) is tied to the use of “matured heartwood” (Guijo/Narra) harvested

under Muyong laws. This makes the granary a permanent infrastructure asset that does not require the replacement costs associated with modern galvanized iron sheds which rust in 10-15 years in mountain climates. The initial investments in a traditional Alang provide a century of zero-cost storage, whereas modern sheds incur recurring costs that deplete the income not spent on food.

In addition, Padilla (1991, p. 27) mentioned that the use of Halipan (cylindrical wooden rat-guards) and elevated stone bases reduces post-harvest grain loss to less than 5% whereas modern floor-level storage suffers 15% to 20% loss from rodents. Also, Pasigui (2018, p. 112) stated that a 36-month longitudinal study proved that the Halipan (cylindrical rat guards) achieved a 98% success rate in preventing *Rattus tanezumi* (the Asian house Rat) from breaching the storage chamber. This significantly outperformed modern wire mesh screens, which were circumvented by rodents in 40% of cases through rust-weakened holes or gap chewing. The results emphasize that integrating traditional ecological knowledge with modern agricultural practices can significantly improve food security and post-harvest preservation, particularly in rice-producing communities of the Philippine highland.

Also, Zialcita (2006) mentioned that "nail-less" (mortise-and-tenon) construction allows the Alang to sway during seismic activity. The nail-less construction of the alang not only preserves the integrity of the granary itself but also protects stored grains, ensuring continuity of food supply during seismic events. The Alang granary provides structural resilience, protects critical food resources, and supports household food security.

A 10-year study conducted by Taguibao (2023) on seeds stored in Alangs (granary structure used in highland communities) revealed that the storage environment function as an "Evolutionary Filter." The seeds that undergone natural selection process in the alang become approximately more resistant to highland blast disease that affects rice crops in mountainous region. The findings highlight the

importance of traditional granary storage system, as they not only preserve seeds but also contribute to the development of resilient, locally adapted rice varieties, helping farmers maintain sustainable agricultural practices and protect crops from environmental stresses and diseases.

Selvino's (2024) study measured the "smoking effect" in Sagada. Kitchen smoke (from the heart below or near the Alang) coats the wood in a layer of soot and creosote. Creosote is a thick, oily, and carbon-rich liquid or residue produced by the incomplete combustion (burning) of wood or other plant matter. When you cook using a wood-fired hearth (dalikan) below or near a traditional granary (Alang), the smoke rises and deposits this substance onto the structure above. The smoky odor of creosote is highly effective at repelling granary weevils, moths, and even rodents. It masks the scent of the grain that would normally attract these pests.

Aside from the structure and materials used in building the rice granaries. Cultural traditions are also tied in the agamang system. Aguilar (2013) explains that rituals like Iboy (ritual rest) are a social enforcement mechanism to prevent "panic consumption." By declaring the rice "at rest," the community allows the grain to reach a critical low moisture content, which prevents "yellowing" and internal mold. Findings suggest that this ritualized wait period effectively doubles the storage life of heirloom rice compared to milled white rice.

Teng (2019) explicitly noted that household stockpiling like the Alang is the most decentralized and stable form of food security but is the least monitored by national governments. It found that while regional reserves exist, they are often "reactive". The study recommends a shift toward "proactive" stockpiling where a 30-day buffer stock is maintained all times to handle the increasing frequency of climate-driven crop failures. The study quantified that Southeast Asia still faces a 15-25% loss in the rice supply chain due to poor storage technology. The study argues that improving "technological stockpiling"

(infrastructure like the Alang but modernized) could reclaim enough rice to feed an additional millions of people without planting more land.

IRRI (2013) also mentioned in their report that the Alang is the primary reason for the preservation of 325 unique landraces in the Cordillera. Because each family has its own storage, the region acts as a decentralized seed bank. This prevents the genetic erosion common in central industrial silos, where a single disease or power failure can wipe out the region's biodiversity.

Over the years, food security is being challenged due to external factors like climate change specifically extreme weather events-droughts, floods, storms disrupt agricultural production, population growth and urbanization, and environmental degradation like soil erosion, deforestation, and loss of biodiversity reduce long-term productivity.

In addition, prolonged health crises, such as pandemics and epidemics, as well as natural disasters like typhoons, earthquakes, and flush floods, often lead to food insecurity in communities lacking food reserves, a phenomenon observed worldwide. During the COVID 19 pandemic in 2020, the extended lockdown or quarantine, which lasted over more than a year, exacerbated food insecurity, prompting many families to depend on government and international food donations. In contrast, the Indigenous Peoples of Mountain Province, Cordillera Administrative Region in the Philippines declined government issued food packs and relied on their traditional knowledge and practices to address food insecurity.

Hence, the study was conducted to document the indigenous knowledge strategies employed by the indigenous peoples to address food insecurity during health and natural disasters. The findings can serve as valuable resource for Local government Officials, community development planners and Disaster Risk Reduction Management Committees (DRRMC) in designing

effective and responsive health and natural disaster mitigations programs.

Conceptual Framework

The indigenous peoples have a worldview in which food security is deeply rooted in their ancestral lands. For them, "land is life" where they cultivate their crops such as rice. They regarded land as "tawid" (sacred inheritance) from their ancestors and must be preserved and passed on. As much as possible, it should never be sold; and if circumstances necessitate its sale, it is entrusted only to close relatives to ensure it remains within the lineage and is never lost.

In context, without the availability of land, they cannot cultivate their crops such as rice. Rice farming is the major industry in the Cordillera and rice is the staple food of the Igorots and the Filipinos in general. But they also grow root crops such as camote or sweet potatoes, yams and legumes. These crops are stored in the agamang to lengthen their shelf life to be consumed during health-related disasters or during important family and community ceremonies. The structure, design and the material used in building the agamang played a significant role in preventing the entry of any pest or insects that might eat or destroy the stored crops.

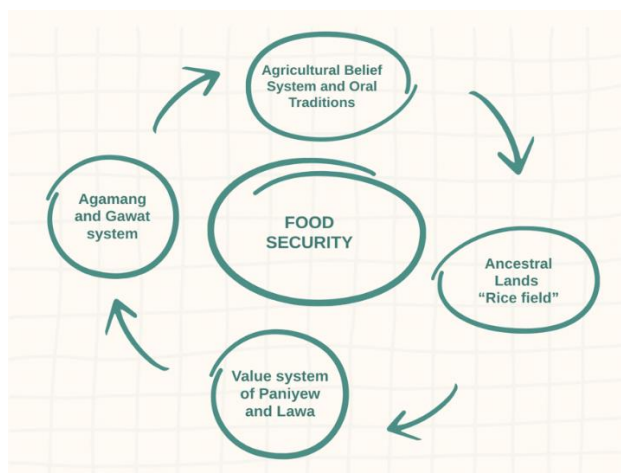
The sustainability of the food security in Sadanga is associated with the interconnectedness of the four elements: the availability of the land to be cultivated, the existence of the agamang and gawat system, the practice of agricultural belief system and oral traditions for the preservation of the agamang system, and the value system of Paniyew and Lawa. Together these serve as guiding principles of the Indigenous peoples in their decision making to ensure food security especially in times of health disasters or emergencies such as sudden death of loved ones.

However, there is a possibility that the agamang system will disappear through time due to external factors like urban migration and growing influence

of cash economy. If these persist it will erode traditional practices, the worldview of the IPs may shift, which will eventually put food security at risk especially in times of health disasters.

Hence, there is a need to document the indigenous knowledge strategies employed by the people of Sadanga to be used as vital baseline data or use as model in addressing food insecurities in the future.

Figure 2 The Schematic diagram of the Study

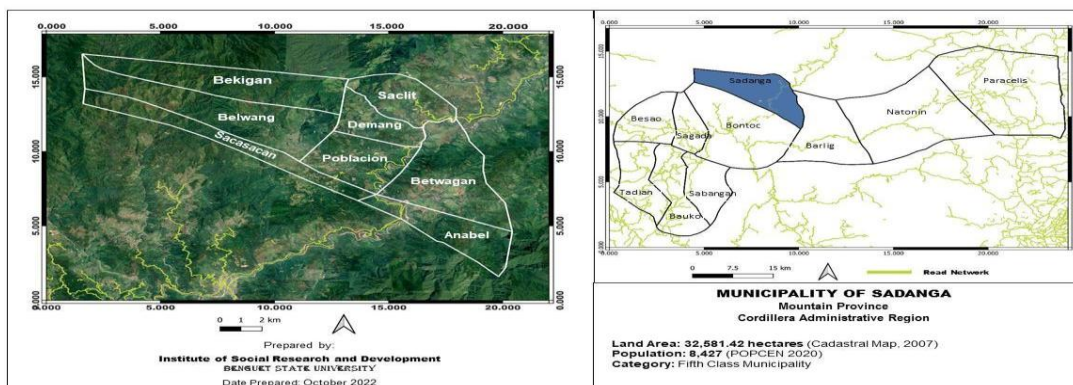


Methodology

The study employed qualitative approach specifically narrative inquiry to obtain information on the food security practices of the Indigenous Peoples in the Cordillera specifically the

municipality of Sadanga, Mountain Province in the Cordillera Administrative Region, the northern part of the Philippines.

Figure 3 Map of Sadanga, Mountain Province



Sadanga is a municipality in the landlocked province of Mountain Province, composed of eight (8) barangays namely: Sacasacan, Poblacion, Demang, Anabel, Betwagan, Sacalit, Bekigan and Belwang. The municipality has a land area of 259.79 square kilometers of Mountain Province's total area. Sadanga is inhabited by the indigenous peoples called Isadanga, a subgroup of the Bontok ethnolinguistic group. Their major industry or

livelihood is farming where they grow rice, vegetables and legumes. As an Indigenous community they have rich indigenous practices that they have practiced since time immemorial amidst urban migration and modernization. One of which is the indigenous strategies for food security through the agamang system.

Data were obtained from the key informants- community members and elders, Indigenous Peoples Mandatory Representatives (IPMR), Municipal and Barangay Officials through Key Informant Interviews (KII), Focus Group Discussions (FGD) and onsite observations. Thematic analysis was utilized to analyze and interpret the raw data gathered from the series of fieldworks in the community. Validation was also employed to clarify the vague data. For Ethical considerations, Free Prior and Informed Consent (FPIC), specifically certificate of precondition was secured from the community through the assistance of the Provincial National Commission on Indigenous Peoples (NCIP) of Mt. Province. Informed consent was also secured from the key informants before the implementation of the study. Validation with the assistance of the NCIP was conducted to ensure accuracy of data gathered from the community. Confidentiality of information was considered and the result was used for the purposes of the study.

Results and Discussions

The Role of 'Agamang system' in ensuring Food Security during Health-Related Disasters

The granary, locally called "agamang" is where the dried rice harvests are stored in Sadanga, Mt.

Province. It is called, "alang" in other parts of the Cordillera. However, it should be noted that in Ifugao, the term "agamang" is not for the storage of rice instead it is a sleeping quarter of the unmarried boys and girls (baru or balasang). The agamang may be any available place, a house or a hut, constructed in the corner of a house ground either by the parents for their children or by a group of people (Sals, 1955). In the study of Lambrecht (1955) he said that, "Ifugao boys and girls know a multitude of tales, which they narrate in their "agamang" sleeping places, to amuse their companions, when sleep is slow in coming". Also, their rice granary is called alang.

These agamang are built near the rice fields or near the community village. Rice granaries in Sadanga are unique since it has 2 storey/ layer structure (figures 3 & 6) as compared to other rice granaries in the Cordillera which is one storey like the alang in Tocuan, Bontoc just a few kilometers away from Sadanga (figure 4 & 5). The physical structure is made of wood and the roof is mostly cogon or tiger grass but at present many used galvanized iron for durability and not too often change the roof. The agamang is built in a manner to ensure that the rice stored inside would be protected from mice and other rice pests, yet provide for enough ventilation to prevent mold from forming inside.

Figure 4 Agamang in Sadanga Mt. Province, Cordillera



Figures 5 and 6 One storey Allang in Tocucan, Bontoc Mt. Province

Aside from dried rice grains “palay”, other crops like legumes, tubers (sweet potato or camote), and sugarcane wine “fayas”, and farm tools are also stored in the agamang. As observed during the fieldworks, they usually stored dried rice grains in the second layer while legumes, sugarcane wines

and farm tools are store in the first layer. This practice is similar with the study of Backian (2016) that the storage structures of some Indigenous Peoples are principally for rice harvest but are also used for prolonged storage of root crops.

Figure 7 A 2 Storeys Agamang in Sadanga, Mt. Province

However, if there are plenty of unhusked rice they also put in the first layer of the rice granary. In Anabel, one of the barangays of Sadanga which has no separate agamang, they put the rice on top of

the fire place or “dalican” inside their house for drying. If it is dried, they transferred it in a storage room which is part of the house.

Figure 8 Agamang where dried rice grains and sugarcane are stored.

Rich families, or the ‘kadangyan’, may have more than one agamang to store all their rice harvest. But even the poorest households have their own agamang. Some poorer household’s agamang may not supply the whole year’s rice needs but additional rice supply is easier and cheaper to access these days, as compared to the previous decades (Bagawi, personal communication, 2021).

Every household stores the year’s crops in granaries and consumes the produce until the next crop is harvested. Rice crops are intended for household consumption and the sale of rice for cash is limited to farmer-traders who intend to plant sticky rice varieties that command a higher price in the market.

Historically and culturally, it is taboo to completely empty the agamang since the purpose of the stored rice is for emergencies and to be used for the conduct of family, clan, community rituals and ceremonies. As explained by Gabby Ganggangan (2022) the municipal mayor, “In Sadanga, when we harvest, we do not sell, we put it in our agamang for our consumption. What we harvest now we will not consume since that is for the next year. Meaning we are one year ahead for rice reserve. What we are eating now is our harvest from last year. So, our harvest now is our food next

year. If we observe the cycle, we have one-year reserve of food supply. Even if worst comes to worst, even if the source of food supplies from outside will be cut, our agamang can sustain us for up to the next harvest season”. This implies that the people of Sadanga have one year buffer or reserve of rice while waiting for the next harvest. It also means that the agamang is sustainable in response to emergencies since they have a deep-rooted culture practice not to completely empty the agamang.

Role of Agamang during family/community Rituals and Emergencies

As shared by the key informants, the contents of the ‘agamang’ are utilized during chono, the luxurious cultural wedding of the Isadanga which last for a month or more where supplies of rice are needed to feed the relatives who are coming from near and far places. In addition, it is also utilized during emergencies like sudden death of loved ones, during natural calamities such as prolonged typhoons that destroys the crops of the community. As mentioned by one of the municipal agriculturists, it is their cultural practice to store rice reserves in their agamang, these will be used during emergencies, weddings and death of family members or relatives. In cases that they lack rice to

be consumed there are commercial rice to be bought but never “inayan” (taboo) to completely empty the agamang. She also mentioned that one of their works during the pandemic was to monitor the available contents of the agamangs in all the barangays to prepare a rice sufficiency contingency plan in cases of rice shortage. In times like this, the people resort to open their agamang. Over the years, the agamang ensure food security in Sadanga. As mentioned by the key informants there were no stories of families who experienced hunger during health disasters in the history of Sadanga as far as they can remember.

Role Agamang during the Covid 19 Pandemic

On March 17, 2020, the COVID-19 pandemic disrupted economic activities around the world and the global economy shrank to an estimated -3.2% (Congressional Research Service, 2021). The Philippines had an economic contraction of as much as 9.5% in 2020 (Mapa, 2021). As people around the country were asked to stay home, factories, construction, small and medium businesses, and other service sectors were shuttered down. As many as 3.2 million workers were affected due to business closures in the Philippines (ILO, 2020). With no source of income, many families of workers affected by the lockdowns need government intervention. Local governments were tasked by national agencies to distribute food packs and cash assistance to the most vulnerable sector of the population.

However, during the lockdown in 2020 to 2021, the municipality of Sadanga in Mountain Province in the Cordillera went viral in social media, local and national television when their municipal executive waived the food packs and cash assistance (Social Amelioration Program, SAP) to the national government to be given to those who need it in the urban areas. While government officials of other provinces in the Cordillera, and other regions in the Philippines received the food packs and financial assistance given by the government during the pandemic, only the municipality of Sadanga, waived the food and financial aids given by the government

to be given to communities and urban areas who most need it. The municipal executive explained that the community aids was returned to the government because there are places in the urban areas who most needed the aid. He further shared that during the pandemic, the news in the national, local televisions and radios shows people from the urban areas who are quarreling just to get their share from the food packs. Because of this reason, as explained by the mayor, they confidently returned the government aid because they have indigenous practices that made their municipality self-sufficient since they have the ‘agamang system’ that sustain them through generations in times of food shortage. Indeed, unhusked rice that was stored for as long as three years were finally milled for consumption during the pandemic.

The return of the food packs was supported by the villagers, arguing that each family has agamang, or rice granary, where the family’s year-long food supply is stored. Almost every household also raises chickens, hogs, and ducks for domestic consumption. Rice harvests in the municipality are often for household consumption and not sold for cash, except for a few varieties of sticky rice that are intentionally cultivated to be sold. If anything, some even argued, what became problematic during the lockdown regarding food supply is how to transport rice and other produce such as legumes to family members living in urban areas where food may not be readily available to them.

In addition, it is also interesting to note that the people of Sadanga’s decision to return the food packs is associated to their value of inayan/paniyew (taboo) and lawa (do not do it). These values serve as a guiding principle of the Igorots in general to do what is right. In context, during the pandemic in 2020, the food packs from the government are not enough for everyone. As mentioned by one community member, the food packs, consisting of sardines, noodles and coffee were intended only for those members of the 4Ps (Pantawid Pamilyang Pilipino Program) and it will not supply all the community members. 4Ps is the

program of the Philippine government that aims to break the cycle of poverty by investing in health, nutrition, and education for children aged 0–18 years old. In terms of food pack distribution, 4Ps members were the priority to be given. Hence, during the pandemic, they opted to return the food packs to the national government because this might create conflicts in the community anyway, they have ‘agamang’ system in response to food security.

They considered their value system of/ *lawa* or *inayan* (taboo) if other members will not be given food hence, the villagers in Sadanga, Mountain Province supported the local government in returning the food and cash aids from the government to be redistributed to other areas that may have needed the aid. In the Cordillera in general, one of the value systems that guides the behavior and way of life of the Igorots is the value of *Inayan/ Paniyew* and *lawa*. Hence, even in times of health disasters, this value guides the local officials in their decision-making to ensure health and well-being of their community members.

‘Gawat System’ as an Indigenous Strategy to Ensure Food Security

In situations when poorer farmers have less harvest than expected, an indigenous practice of ‘gawat’ provides for those whose rice supply may not be enough for the whole year. Gawat is essentially loaning or borrowing rice to or from their kins or neighbors. When a family needs to borrow rice, the mother or father just needs to approach a kin or neighbor who is known to have more stored rice. The *kadangyan* kin or neighbor often have a lot more rice paddies and therefore, more rice harvests. Gawat is almost never rejected as long as the lender still has rice stock. Payment of gawat may be in the form of labor, money, or rice when it is available. The borrowed rice will be returned if the family is already well off and have enough rice reserves, no additional interest and duration needed. In some cases, gawat can be returned through rice or animals as meals during the celebrations of the hosts family.

In Sadanga, being a *kadangyan* (rich) is not only measured by the number of lands or properties or rice granaries they own but their sense of honor and responsibility to take care of their clan or kin by not letting them go hungry specifically during health disasters. As mentioned by one of the key informants, the respect to the *kadangyan* will disappear if some members of their clan experienced hunger without the help of their *kadangyan* relative. This is considered “*bain*” or shame in the indigenous community. Hence, in times of the shortage of rice by the poor families, the *kadangyan* provide help through the *gawat* system.

During, the pandemic, the rice reserve of Sadanga in the *agamang* (except for the people of *barangay Anabel* in Sadanga who keep their rice harvest inside their own homes because they do not have *agamang*) basically sustained the community when the entry of commercial rice supply was restricted by border controls (Lassin, personal communication, 2021).

Most of the key informants also mentioned that they did not hear news of families in Sadanga who went hungry because of shortage of food. But there are families who adhere to the *gawat* system. It should be noted that the municipal agriculture office distributed vegetable seeds to the locals. Hence, they were able to grow beans, squash, corn, *pechay* and other vegetables that they planted in their garden. They even sent some of their produce to their families in Baguio City when the lockdown relaxes. The backyard vegetable production was also a big help as source of their viand during the covid 19 pandemic.

Cultural Traditions that sustain the ‘Agamang’ System

The *agamang* is more than a food storage; it is a ritual site where offerings are made to deities and ancestors, emptying the *agamang* is mostly taboo because when situations arise that the family needed enough food, such as death or wedding arise, the *agamang* is often the source of food for

such occasions. Keeping rice in the granary maintains ritual timing for planting and harvest; an empty granary disrupts the agricultural cycle. The people of Sadanga perform rituals and practice series of *teer* (community rest day) during the duration of rice agricultural cycle specifically during seed sowing, planting, harvesting and post-harvest seasons). The community rest is implemented for 1 to 3 days depending on the decision of the community elders. During the observance of the *teer* the villagers are not allowed to go to their farms, instead they stay in the community to observe *teer*.

According to old traditions, during strict community *te-er*, people can move around or work inside the community, as long as the work being done is not loud or disruptive. In Sadanga, *ngilin* is used for families (not the whole community) who recently experienced life incidents such as birth, accidents, death, etc. Isadanga normally calls the community rest as *te-er*. Their reasons for performing these rituals were to have enough seedlings, to drive away pest and diseases, to ask for blessings from *kabunian* for bountiful harvest, to have sufficient supply of water to the rice fields, to drive calamities that might destroy the crops, to offer prayer to the spirits and ancestors who guards the rice fields and the people and animals in the village. These narratives are common among the Indigenous Peoples in the Cordillera specifically the rice farming communities. The finding corroborates the results of the study of Tudlong in 1993 about the cultural rituals associated with the agricultural activities in Bontoc, just a neighboring municipality of Sadanga. As reiterated by the key informants this tradition has passed down through generations. As they often mentioned during the fieldworks, performing rituals and conducting the observance of community rest is the cultural practice of their ancestors in the past which has passed down to them.

During the harvest season, the value system of *og-ogfo* (*camaraderie*) is observed. Community members and relatives will take turns to harvest the

ripened rice grains depending on the schedule of households. Snacks and meals are provided by the owner of the rice field throughout the harvest. As soon as the harvest is finished and the rice is brought to the *agamang* (at any time of the day), the family feeds the harvesters. In the old times, the farmers used *obfu*, or reciprocal labor, for most field jobs such as rice planting and harvesting. However, today some farmers may work for wages during planting and harvesting if he/she is not a member of the *obfu* group.

It should be noted that there are various rituals conducted before, during and after the harvest of ripened rice. Customarily, elders offer animals like chicken added with *etag* (salted meat) together with rice/ glutinous rice or sweet potatoes to the ancestral spirits. In addition, after the sun drying of the ripened rice grains these will be stored in the *agamang*. As shared by the key informants, before they put the dried rice grains inside the *agamang* they conducted ritual with the use of meat, chicken and rice accompanied by prayer. During emergencies, when there is a need to open the '*agamang*', the owner will say a prayer to the ancestral spirits who are the guardians of the rice fields and the *agamang*.

Conclusions

The traditional practices of '*agamang*' (rice granaries) and '*gawat*' (loaning of rice or animals) system play a significant role in ensuring food security in Sadanga, Mountain Province since time immemorial specifically, during health-related disasters like epidemics, pandemics and natural calamities like typhoons and landslides. The sustainability of these traditional practices amidst urban migration and modernization is associated with their deep-rooted cultural practices tied to their agricultural cycle like the observance of the *teer* (community rest) and *Ngilin* (no one will roam around) before the planting and harvest seasons. They have also value called "*ayyew*" or not to waste foods. Hence, every grain of rice should not be wasted since it is considered a seed of life.

In addition, the community have a strong belief that it is taboo to completely empty the agamang since it will disrupt their agricultural cycle which sustain their way of living since time immemorial. This practice also ensures one year food reserve of the families and community up to the next harvest and even in times of disasters such as the Covid 19 Pandemic in 2020 and the oil crisis in March 2026 which affects the food security of the community.

Recommendations

The local government units and Disaster Risk Reduction Management may consider adopting the concept of agamang and gawat system in ensuring food security during health-related disasters. The local and national government may design modern agamang to store rice to have a buffer of one year reserve in response to upcoming strong typhoons that destroy the crops and rice

fields of the farmers specifically during the rainy season from July to October. Disaster Risk Reduction Management Committee (DRRMC) may learn indigenous knowledge strategies from the Isadanga in ensuring food security specifically in times of health disasters.

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References

- Aguilar Jr., F. V. (2013). Rice and magic: A cultural history from the precolonial world to the present. *Philippine Studies: Historical and Ethnographic Viewpoints*, 61(3), 297–330. <https://archium.ateneo.edu/phstudies/vol61/iss3/3>
- Backian, G. (2016). Traditional Storage and Utilization Practices on Root and Tuber Crops of Selected Indigenous People in the Northern Philippines. *Mountain Journal of Science and Interdisciplinary Research* (formerly Benguet State University Research Journal).
- Camacho, L.D., Gevana, D.T., Carandang, A.P., & Camacho, S.C. (2015). Indigenous knowledge and practices for sustainable management of Ifugao forest in Cordillera, Philippines. *International Journal of Biodiversity Science, Ecosystem Services & Management*, 12(1-2), 5-13. <https://doi.org/10.1080/21513732.2015.1124453>
- IRRI. (2013). Traditional rice varieties'/IRRI. https://books.irri.org/971220294X_context.pdf
- Lambrecht, F. (1955). Ifugao tales. *Folklore studies*, 14, 149-196.
- Mapa, Dennis. 2021. Philippine GDP posts -8.3 percent in the Fourth Quarter 2020; -9.5 percent for full year 2020. Philippine Statistics Authority (PSA). <https://psa.gov.ph/content/philippine-gdp-posts-83-percent-fourth-quarter-202095-percent-full-year-2020>.
- Padilla, D. B. (1991). Traditional grain storage structures in the Philippines. In T. H. Borromeo & N. C. Altoveros (Eds.), *Manual of the prevention of post-harvest grain losses* (p. 27). Food and Agriculture Organization (FAO), Rome
- Padilla, H. (1991). The Bontoc rice terraces: High yields. <https://edepot.wur.nl/397736>
- Pasigui, R. J. (2018). Ecologically-based rodent management in Philippine rice storage systems: A longitudinal study on Halipan rat guards. Doctoral dissertation, University of the Philippines Los Baños.
- Policy and strategies to improve nutrition and health for Indigenous Peoples. https://www.fao.org/4/i3144e/I3144e16.pdf?utm_source=copilot.com
- Scott, W. H. (1962). Cordillera architecture of Northern Luzon. *Folklore Studies*, 21, 186-220.
- Sals, F. J. (1955). Primitive Education Among the Ifugaos: Religious and Moral. *Philippine Studies*, 3(1), 70-89.

Selvino,B.P. (2024). The Sagada rice agricultural practices. TALA Online Journal, 7(2).

<https://talakasaysayan.org/index.php/talakasaysayan/article/view/215>

Sister, L. E., de Chavez, H. D., Kitma, S. J. E., Borromeo, T. H., & Altoveros, N. C. (2022). On-Farm Conservation of Traditional Rice Varieties in the Provinces of Quirino, Iloilo, Antique, and Davao Oriental, Philippines: Drivers and Implications for Policy. In S. Ramamoorthy, et al. (Eds.), *Plant Genetic Resources, Inventory, Collection and Conservation* (pp. 15–41). Springer Nature Singapore. <https://doi.org/10.1007/978-981-16-7699-4>

Taguibao, E.P. (2023). Evolutionary dynamics of granary-stored seeds. DA-BAR. <https://www.bar.gov.ph/>

Teng, P.S., & Darvin, B.A.C. (Eds.). (2019). *Food reserves: A comparative study on food reserve management and policies in Southeast Asia*. Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). <https://www.searca.org/pubs/monographs?pid=434>

Tudlong, L.C. (1993). *Cultural rituals associated with the agricultural activities of the Bontocs*. Benguet State University

What is Food Security and How is World Bank Responding to Food Security Crisis? 2026. https://www.worldbank.org/en/topic/agriculture/brief/food-security-update/what-is-food-security?utm_source=copilot.com

Wittman H (2011) Food sovereignty. A new rights framework for food and nature? *Environ Soc Adv Res* 2:87. <https://doi.org/10.3167/ares.2011.020106>.