PAG-ABYAD SA ALTARAN: CARING FOR THE RICE TERRACES IN TAYABAS, QUEZON PROVINCE

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This paper is a documentation of the rice terrace construction and maintenance technologies used by upland rice farmers of Tayabas, Quezon Province. It focuses on the local technologies and social structures of the Tayabas farmers in their conscious and constant preservation and maintenance of the rice terraces. Through participant observation and key informant interviews with farmers, residents and barangay officials, this study presents the caretaking and maintenance techniques, including the combination of traditional and modern farming tools, that are utilized by Tayabasin farmers in the face of threats such as pests, storms, and terrace deterioration. Further studies could explore opportunities to intensify appreciation for rice terraces as a cultural landscape and to sustain efforts of preservation.

The Philippines is a rice-producing country. Rice crops are grown in flooded paddies; and unlike other crops that adapt to the landscape as they grow, rice crops require a vast amount of constant landscape modification to take shape (Villalon 2007). Over time, highlanders in the Philippines have developed rice terracing as a means of wet farming.

Rice terraces can be described as megaliths, or great stone structures (Manuel 1994:37). Built for the growing of rice crops, these terraces can be seen conforming to the slopes of mountainsides in highly elevated areas. Rice terraces are common in the Philippines and other Southeast Asian countries.

In the Cordillera mountain range, the Ifugao rice terraces epitomize sustainable management principles that have permitted the hilltops to absorb the rainwater which flows into the rice terraced hillsides. Such structures not only avert flooding and soil erosion, but also permits the inundation of rice paddies, to sustain the growth of rice crops. These rice paddies are also ingeniously-constructed water filtration systems that supply neighboring communities with fresh drinking water (FAO 2005:4). The Ifugao rice terraces have become a cultural symbol not just for Ifugaos, but also for the

Filipino people. In 1995, the United Nations Educational Scientific and Cultural Organization (UNESCO) recognized the Rice Terraces of the Philippine Cordilleras as a World Heritage Site.

Keesing's ethnohistory of the Northern Luzon Province (1962) asserts that accessibility to a dependable flow of water for irrigation is crucial for terracing peoples. Thus, not only do wet rice terracing farmers have to worry about planting and growing rice crops, they are also responsible for maintaining the irrigation systems that flood rice paddies. Conklin, in his comprehensive ethnographic atlas of the Ifugao (1980), described various ecological, social, and cultural factors in the sustainability of the rice terraces, including the knowledge about how all these elements are interrelated and utilized. These farming tasks implicate how humans interact with their environment. Both Keesing and Conklin acknowledge that it is only by giving constant care through the repairing, extending, restructuring, and the recycling of resources that the image of the present landscape has been achieved.

However, over the years, there has been deterioration of the rice terraces in Northern Luzon. Various factors like the silent intrusion of giant earthworms have caused terrace walls to crumble (Berger 2006; Conklin, 1980:38; Morella 2007; Marquez 2005). Since the inclusion of the Banaue rice terraces in the list of Endangered World Heritage Sites in 2001, crusades have continued and intensified not only to restore this incredible engineering feat to its original state of magnificence, but also to find ways to ensure that this beloved national icon would be sustained for even more generations.

Terracing and Cultural Ecology

Rice terraces are human-made structures that are not natural occurrences in the environment. Original mountainside terrains were strategically modified in order to attain such functional landscapes through which humans translate their cognitive abilities, as Prown (1982) explains. The placement of objects of nature, such as trees, plants, flowers, and rock formations, are indicative of how human beings impose structure on their respective environments. Such actions that modify the environment, as Prown continues, "combine aesthetic values with functional motives" (1982:15).

Functional motives vary with location and necessity. Earlier assertions (Blumentritt 1882; Beyer 1912, 1947; Cole 1909) have stated that rice terracing as an agricultural practice was brought into the country by a distinct migrant group, based on similar terracing techniques by neighboring countries such as Indonesia (Java) and Japan (Quoted in Keesing 1962:314). Anthropologist E. Arsenio Manuel (1994) suggested that rice terracing

technology spread not only to the Northern regions, but also to the Southern Tagalog Region of Luzon. Manuel introduced the possibility that with an entrypoint at Manila Bay, migrants who utilized rice terracing passed through the Pasig River and the Laguna de Bay area, eventually discovering areas in Majayjay, Laguna, suitable for terracing. However, no further evidence to corroborate this theory has been published.

On the other hand, Keesing (1962), based on early Spanish accounts, posits that terracing in the Northern uplands was developed during the dawn of Spanish colonization, when Ifugaos living on the lower levels of the Cordillera fled to the mountains to escape paying tribute. The challenge of living in the uplands provided the opportunity to develop rice terracing. Recently, Stephen Acabado (2009) sought to utilize carbon dating to estimate the age of the Ifugao rice terraces, with the assumption that lowland Cordillera dwellers fled the Spaniards through the Alimit River, which was presumed the oldest in the area. Acabado used charcoal samples found beneath the terrace wall foundations. Results indicated that the rice terraces in Bocos, Ifugao were probably built after 1585 AD, or some 60 years after the Spanish first came upon the Philippines in 1521.

In fact, a closer look at rustic mountainsides in many areas in the Philippines would reveal traces of agricultural terracing. Much is yet to be investigated about the history and evolution of rice terracing in the country.

In the Southern Tagalog Region, around 500 kilometers south of the Ifugao Rice Terraces, one municipality where farmlands make use of indigenous terracing technology is Tayabas, Quezon. This municipality has 66 barangays, and occupies a land area of 23,095 hectares (see Figure 2). Tayabas is a landlocked municipality bounded to the north by the municipality of Lucban, to the east by the municipality of Mauban, to the west by the municipality of Sariaya, and to the south by the municipalities of Lucena and Pagbilao (Figures 3 and 4). Of the municipality's total land area of 23,095 hectares, 15,816 (68.4%) is used for agricultural purposes. Irrigated rice paddies comprise 2,428 hectares (10.5%), while 13,205 hectares (57.2%) are coconut groves. Barangay Dapdap, one of Tayabas' 66 barangays, is located around 7 kilometers from the *bayan,* the municipality's capital. Considered as a *linang* or rural farmland, it is comprised of roughly 8,500 hectares of agricultural land. Rice and coconuts are the most suitable crops for planting in the area, due to the area's absence of a dry season, with a pronounced maximum rain period occurring from October to December.

How do Tayabasin farmers care for the rice terraces and the environment in Tayabas, Quezon Province? This article is an attempt to document the

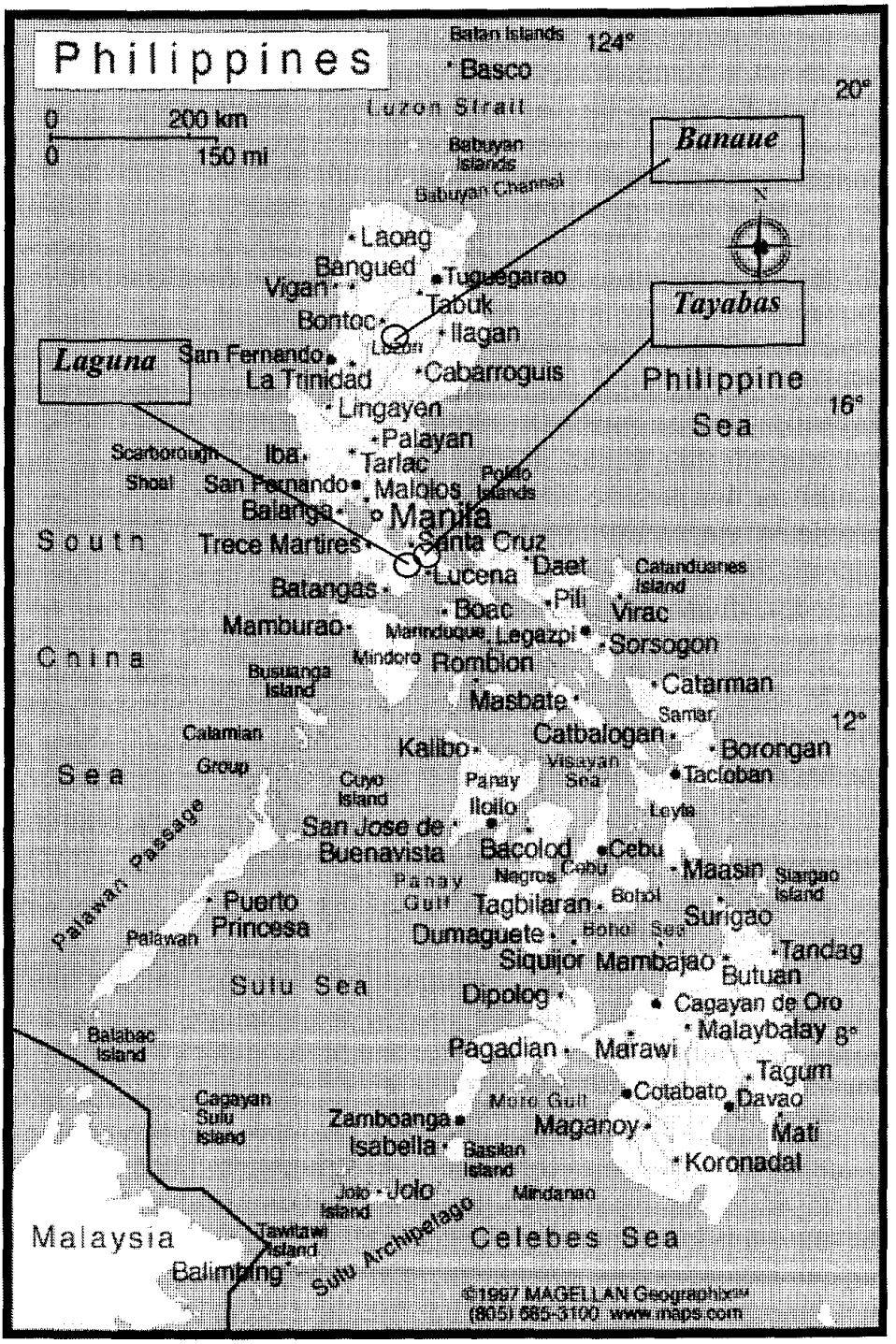

Figure 1. Map of the Philippines showing Laguna, Tayabas, and Banaue

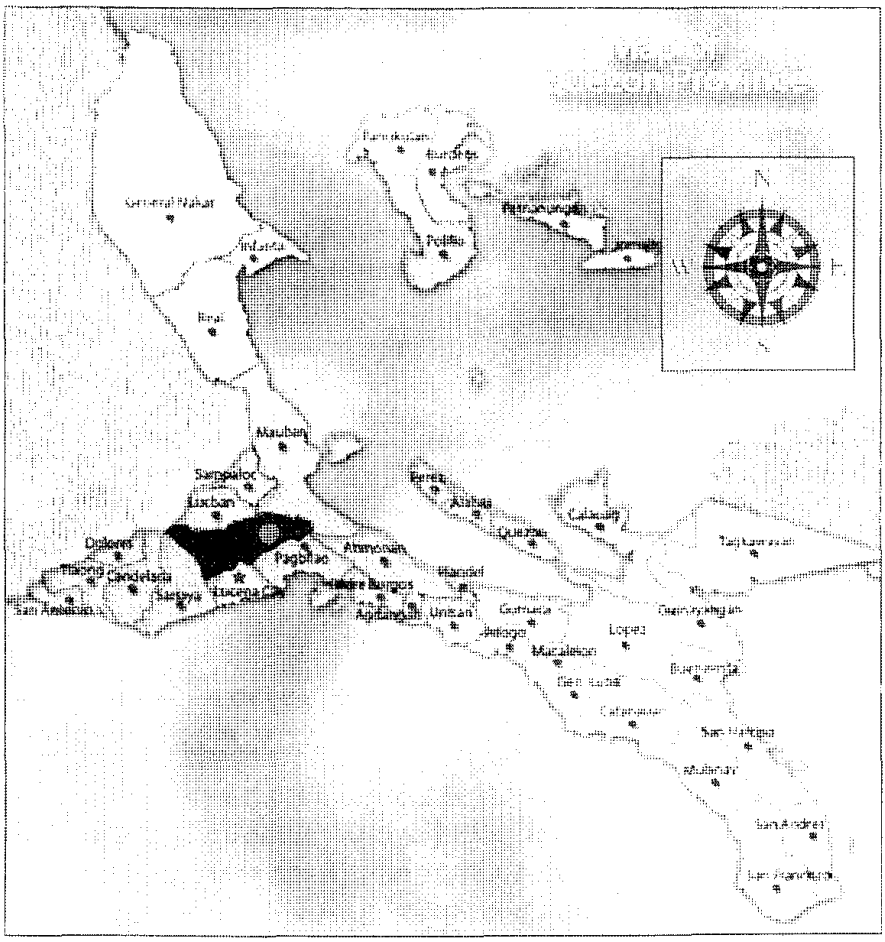

Figure 2. Map of Quezon Province

social structures and technologies that the present-day Tayabasin have employed to ensure the integrity of their rice terraces.

This study uses the term 'care' or 'care-giving' to signify human interaction with the environment for the purposes of rice terrace maintenance. The Southern Tagalog word *pag-abyad* is the local term to describe the conscious giving of attention or care to a certain object or activity. In the case of agricultural terracing, farmers are seen giving conscious and constant care and attention to the growing of rice crops and the maintenance of the rice terraces, which are known in the area as *altaran.*

The imposition of social structures represents an intangible aspect of 'care-giving' to the rice terraces, while the utilization of tools (both traditional and modern) is the material aspect of care-giving. Built for the chief purpose of agriculture, rice-terracing as a system requires landscape transformation and specific arrangements of soil, water, earth, plants and other elements, to correspond to a certain standard that maintains the

structure. Conklin's (1980) intensive documentation of the Ifugao Rice terraces shows that the technology of creating and maintaining rice terraces with different social structures is still a subject that should be explored further.

The Tayabas rice terraces

Like wide staircases lined with green velvet carpets, rice terraces climb the slopes of Mount Banahaw in the province of Tayabas, Quezon. Located at a latitude of 14.6044 °N and a longitude of 121.0472 °E with an altitude of approximately 413.30 meters (1,356 feet) above sea level, these majestic rice paddies are products of generations of farming knowledge and practices that existed long before its current inhabitants were born.

Known to the locals as *altaran,* the stair-like structure of such paddies may have recalled high altars of a cathedral which soar from floor to ceiling. Or they may have recalled the stairs that lead from the floor to the elevated altar, the *monumento*, where the priest places the monstrance with the Sacred Host on Holy Thursday evening. Some Tayabas farmers also say that *altaran* alludes to the rice terraces being very much elevated to heights comparable to that of the sky.

The origins of the rice terraces have yet to be fully explained. However, locals are sure that such rice paddies have been there since the time of their ancestors.

Modifications of the mountainside have been brought about by constant human intervention. Figure 3 on the left depicts a well-maintained terraced landscape while Figure 4 to the right displays an unmaintained terraced landscape. Although man-made intervention is visible through the step-like appearance of the unmaintained landscape, uncut grass deforms the soil edge and leaves the terrace walls vulnerable to erosion. Figure 4 is an example of a rice field that was once terraced but whose maintenance, repair, and utilization for wet rice farming had been halted for various reasons.

The rice terrace structures are more defined and sculpted when regularly maintained (as shown in Figure 3). Grass is trimmed to reveal the stair-like structure, and soil is intact to hold the water and uphold the overall integrity of the terrace walls.

Constant intervention plays a crucial role in the sustainability and the preservation of this cultural landscape. Veteran farmers (*antigong magsasaka)* narrate that conscious and constant tending, termed *pag-abyad* locally, is the key to the sustainability of the rice terraces. During the off-season, farmers walk great distances and painstakingly climb unpaved and

rocky trails to look at their farmlands and ensure the integrity of their terraces and growing rice crops.

Figure 3 (left): Maintained terrace landscape (Feb. 17, 2010)

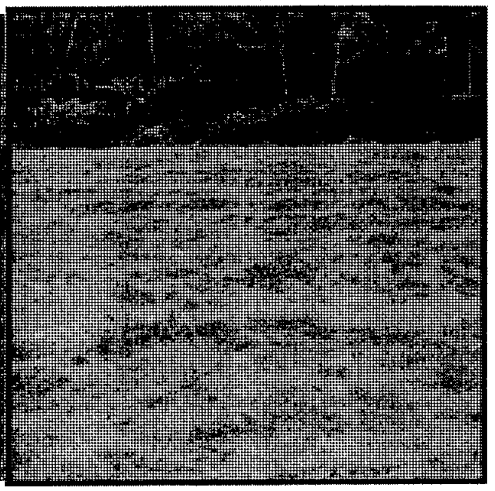

Figure 4 (right): Unmaintained terrace landscape (Aug. 30, 2009)

In farming communities in the municipality of Tayabas, there are two full rice cropping seasons: 1) the wet season harvest (*Aning Panahon)*, which starts with land preparation in mid-June and concludes with harvest in October; and 2) the dry season harvest (*Aning Panag-araw)*, wherein land preparation starts in mid-November to end with harvest from mid-April to mid-May. Each agricultural cycle has four phases: land preparation, planting, off-season, and harvest (Figure 5).

Depending on the type of rice crop planted, the time of month of planting, and the growth rate of particular rice crops aided by various fertilizers and plant medicines, specific harvesting patterns are at the discretion of the farmers in their respective farmlands. Each phase of the agricultural cycle brings about a display of different colors in the landscape.

The agricultural cycle begins with land preparation. Here, land from the previous cropping cycle is broken up and loosened to become a new planting ground. The remains of previous rice crops, which locals call *pa-wowa,* are removed and utilized as fertilizer. Likewise, rice stalks called *dayami* are burned and in some instances buried to nourish the soil. Terrace walls that had been damaged during the other phases of the agricultural cycle are also resculpted or repaired.

As soon as farmers deem their respective rice paddies restored and each *luwang* or paddyfield ready for planting, farmers can now start creating planting beds for rice crop seeds. This is commenced at least one month after

the start of land preparation. By this time, farmers should have also secured an appropriate amount of rice seeds, which type and quantity depend on the discretion of the landowners. Rice seeds are usually bought at local private firms within the vicinity, the Tayabas Agricultural Office, or other stores beyond Tayabas. Half a hectare of farmland would require around three to five sacks of rice seeds, again, depending on the preference of the landowner.

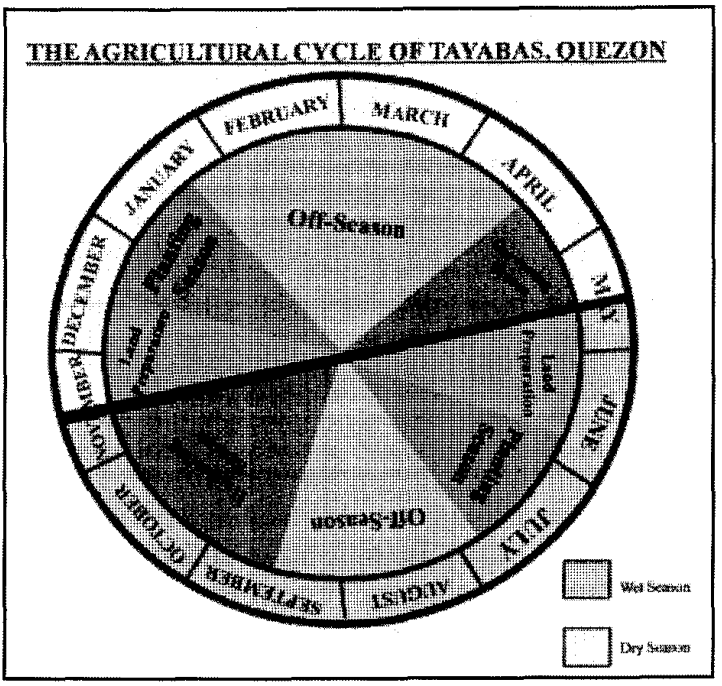

Figure 5: The two rice cropping seasons in Tayabas.

During the period between planting and harvest, farmers have the responsibility of ensuring the sustainability both of the rice terraces and of the planted rice crops. Thus, for the four to five months that are allotted for plant growth, farmers regularly visit their respective farmlands and at a glance, assess the overall appearance of the rice paddies. Once farmers deem that intervention is needed to assure the preservation of their rice crops, they address the specific concerns immediately. The workload during off-season varies and depends on various factors, among them the weather, irrigation system management, weed and pest infestation, and diseases. They work the fields wearing a *salakot*, a native pointed hat made of nipa or coconut palm and a large *anahaw* leaf to shield their backs from the sun and rain.

By the time of harvest (in mid-May for 'dry season harvest', and in mid-October for 'wet season harvest'), rice crops grow up to 28 inches in height (around 2.3 feet), and visibly add yellow colors to the landscape as pregnant

rice crops signal the start of harvesting season. Farmers describe pregnant rice crops whose grains are about to fall out as *"nabusbos"*. From afar, farmers decipher if harvesting can be commenced by simply looking at the color of the rice fields. If a notable 80% yellow shade is visible over the green, then the rice crops are mature enough for harvest.

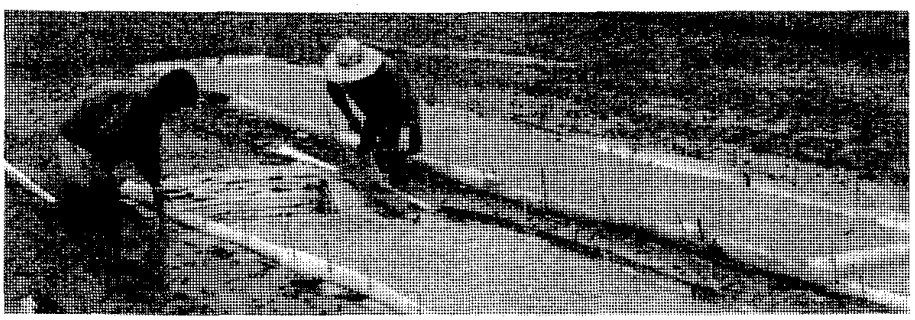

*Figure 6: Banana leaves are used to create a seed bed (*dapog*) for rice seedlings.* Photo taken November 30, 2009.

Local Rules on Land Tenure

There are no visible barriers that delineate boundaries between farm lots. Yet each farmer in the area has committed to memory the boundaries of his or her area of responsibility. Thus boundary disputes among farmers are uncommon. Systems of land delegation and agreements between laborers and landowners have been replicated over generations so much so that farmers and landowners have memorized the land space allocated for each farmer. At a glance, a farmer knows the dimensions and margins of his or her land of responsibility. Some farmlands have also been labelled according to their intrinsic characteristics and other contexts known only to the farmers and locals in the area. Thus, when such name is mentioned, each farmer recognizes it immediately. For example, there is a field known as *Labindalawang Luwang* (Twelve Planting Spaces) because the rice terraces in the area have twelve steps and hence twelve planting spaces for rice. Other farmlands are also named after their caretaker for easier reference. Because farmers have close ties in the barangay, each one is familiar with the location and boundaries of the farmlands which their co-farmers are in charge of.

In farming communities in Tayabas, there are two popular methods by which land is allocated for farming: 1) *kintusan,* the 'land owner-tenant system', and 2) *hunusan,* the 'employer-wage laborer system'.

In *kintusan,* the 'land owner-tenant system', landowners, who are usually based in neighboring municipalities such as Lucban, Sariaya, Mauban, etc., recruit farmers from Tayabas to tend to their farmlands. Their work includes maintaining the rice terraces during the agricultural cycles. During the harvesting season, the tenants and landowners split the harvested rice (measured in sacks) on this basis: 25% for the landowner, 75% for the tenant. Through adopting this system, many farmers in Tayabas have inherited their responsibilities as a farmer from their parents, who were also farmers bound to this agreement with the previous landowners. Such agreements are done through verbal, unwritten contracts, which the landowners and tenants honor.

Hunusan, on the other hand, is the local term for the 'employer-wage laborer system' of farming. In this system, landowners have the discretion to hire laborers of their choice to tend to their farmlands for an agreed-on period. Landowners have the responsibility to pay their laborers an agreed rate, which is usually measured per person per day. Landowners may also rent carabaos, horses, and other production factors. The harvested rice grains (also measured in sacks) are split on this basis: 25% for the worker, and 75% for the landowner. Through this system, wage laborers from other parts of Tayabas and other neighboring municipalities gain access to the rice terraces of the barangay. In this system, the livelihood derived from the rice terraces is not exclusive to the locals of the particular farming community.

Terrace repair and maintenance

Farmers acknowledge that some terrace walls are fragile and prone to corrosion. They are vigilant and geared to repair broken terraces (*nabulwang na pilapil)* immediately when the need arises. There are various reasons why a *pilapil* corrodes. First, the feebleness of the terrace walls could be due to careless or hasty construction, starting from land preparation. Over time, soil falls loose, causing the collapse of the terrace walls. Second, the overflowing of the *luwang* during heavy rainfall can trigger a disturbance in the soil, causing stacked rocks to topple. In some cases, carabaos and humans, when passing through the *luwang* and *pilapil* can also cause terraces to break. For whatever reason, broken terrace walls must be repaired as soon as possible to prevent other breakages in the surrounding areas.

Crucial to the repair of broken terraces (*nabulwang na pilapil)* are rocks known as *gasang,* which are sharp, irregular in shape, and have many holes. These rocks are just big enough to be lifted and mobilized by human hands (Figure 7). The gathering of rocks depends on the opportunities of the farmer. Once such rocks are spotted during other periods of the agricultural

cycle, farmers make use of any chance to transport them to their residences, other huts, or warehouses for storage. However, there is no need to seek for other rocks if the broken *pilapil* already has an ample amount of them. In such cases, the rocks on the *pilapil* are merely rearranged or returned.

Figure 7: Gasang, *an ideal rock used for terrace construction, is irregularly shaped and has many fissures on the surface.*

Figure 8: Giting *is a flat stone with minimal perforations and thus is not ideal for stacking into a terrace.*

There are, however, certain rice fields that are located further down the mountainsides where there is limited accessibility to these types of rocks. Thus, one has to travel to the foot of the mountains or to the irrigation streams in order to find them. The carabao is often made use of to drag mounds of *gasang* (loaded on a *paragos,* a makeshift and moveable container) to one's area where it is convenient to store an ample amount of such rocks. An ideal *gasang* rock has a height of approximately 10 inches, and a diameter of 12 inches. It weighs around 8 to 10 pounds. The *gasang* is preferred over flat, smooth stones which some farmers call *giting* (Figure 8), and which make a less durable rice terrace wall.

Terrace walls that have been completely deformed need resculpting using a *bareta* or metal bar, and a shovel. The *bareta* is used to pierce the ground and loosen soil to accommodate the re-sculpting of the terrace walls. The shovel is used to transport the corroded soil into the desired position. Rocks are then placed or rearranged at the terrace wall's base to ensure the foundation.

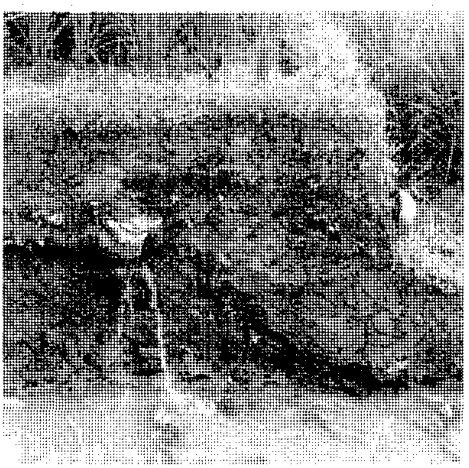

Figure 9: Leakage in terrace walls. (Photo Taken July 31, 2009)

Figure 10: Eroded walls that cause irrigation waters to spill out (left of figure) are 'corked' using rocks (right of figure). (Photo taken July 31, 2009)

Damaged terraces that are still intact but have portions that are eroded (Figures 9 and 10) can be repaired by the placement or rearrangement of rocks. Depending on the location of the damaged terrace, the rocks are

stacked directly on the soil to act as a cork for the damaged terrace (Figure 11). Farmers describe the soil to be the glue that ensures the rocks' immovability. Larger rocks are used for the base, while smaller rocks are stacked on top of them. The amount of rocks placed on the broken *pilapil* is dependent on the extent of damage and the judgment of the farmer repairing it (Figures 11 and 12).

Figure 11: Larger rocks are put on the base of terrace walls while smaller rocks are stacked on top of them.
(Photo taken July 31, 2009)

Figure 12: Terraces found close to irrigation waters are prone to erosion and are repaired by the stacking of rocks.
(Photo taken August 1, 2009)

Village elders and farmers who have lived and farmed in the area since the 1930s have also mentioned that in earlier decades, from the 1930s to the 1980s, the rice terraces' walls in the barangay had fewer rocks. From the mid-1980s to present, however, a dramatic number of rocks had been

manually placed in many of the rice terrace walls to prevent them from crumbling.

Managing animal threats to rice terraces

Growing rice crops must also be shielded from various animal threats. The most common rodent that menaces farmers is the field rat. Nesting in grassy areas, rats eat rice grains once these start maturing, thereby lessening the harvest. Once rats are able to penetrate the rice fields, there is a visible shift in colors among rice crops. When rice crops become brownish instead of bright green, it is an indication that the rats had done their damage.

Over the decades, it was said that so rapid has the multiplication of rats been that some landowners were forced to abandon their lands. To remedy the situation, farmers line the terrace walls with Racumen™, the most common and accessible rat poison in the barangay. They insert a generous amount into cylindrical bamboo shoots which they scatter around the area during planting season until harvest. This effort, however, as evidenced by the continuous existence of rats in the area, is not a sustainable solution.

Another animal threat is the field snail or *kohol* (Figure 13), which also feeds on the rice crops. The snails cling to the muddy areas of the field, and must be handpicked in order to be eradicated. Usually wives or children of farmers take part in this task since it does not take much of a physical toll.

Figure 13: Pests such as kohol *(snails) feed on rice crops and lead to a decrease in harvest.* (Photo taken July 31, 2009)

Various insecticides account for the eradication of other pests and insects. The *uhod,* or worm, which grows to a length of around 8 to 10 inches also sucks the rice crops and destroys the inner portions of the rice grains while maturing. The *atangya,* a smelly insect that resembles a grasshopper

(*tipaklong*), devastates rice crops, and is exterminated with "Karati", an insect spray bought from local stores.

Coping with storms

The municipality of Tayabas is not spared from typhoon paths, and experiences regular rainfall throughout the year. Imprinted in the memory of the locals of Barangay Dapdap is the onslaught of Typhoon Rosing in the mid 1990's that caused devastation to the rice fields.

Strong winds during storms that cause the premature dispersal of rice grains are the farmers' worst enemy. Strong winds cause the rice grains to fall off from the rice stalks and scatter into the rice fields so they can no longer be harvested (Figure 14). This cripples the farmers' harvest and lowers their revenue during harvesting season. Thus, farmers claim they prefer to repair damaged rice terraces caused by heavy rainfall over suffering a great loss in harvest due to powerful winds.

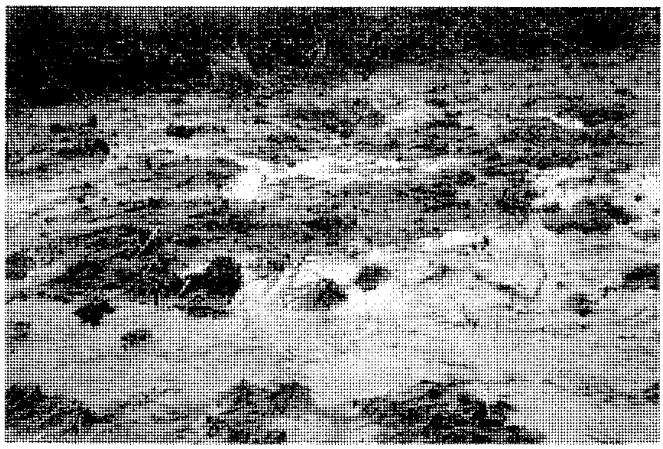

Figure 14: Strong winds can cause young rice seedlings to topple over. (Photo taken July 31, 2009)

Another threat that farmers anticipate during heavy and continuous rains is the overflowing of water in each *luwang* or terrace, and the erosion of the terrace walls (Figures 15 and 16). Once farmers are aware of upcoming storms or if they observe that there has been continuous rainfall, they immediately seal the *papasukan* or water inflow of each *luwang*. However, sealing the inflow does not guarantee that rainwaters will not accumulate in each *luwang*, causing destruction to terrace walls and to growing rice crops. When storms hit in mid-July or mid-August, which is when newly-planted rice seedlings have yet to establish firm roots, strong winds and heavy rains can cause them to topple over and scatter in the flooded *luwang*. Hence,

immediately after the end of a storm or when the rains cease, farmers make it a point to replant the fallen seedlings (Figure 17).

Figure 15: Overflowing and deforming of the terrace walls caused by heavy rains. (Photo taken July 31, 2009)

Figure 16: A flood path brought about by a typhoon.
(Photo taken October 12, 2009)

Nevertheless, farmers in the area assert that the rice terraces adapt to the slope of the mountain and are able to withstand intermittent bad weather conditions. Thus, exceptional damage is only incurred in specific places. Regular rainfalls bring about minimal damage to the rice terraces due to their sustainable structure.

Figure 17: A farmer replanting seedlings damaged by heavy rains.
(Photo taken July 31, 2009)

Community Efforts in Maintaining the Environment

Because rice is a staple in the everyday meal, farmers and their families owe their life and their livelihood to the planting and harvesting of rice crops. The rice terraces serve not only as a source of livelihood and sustenance for the locals, but also as the milieu that unifies the collective consciousness of the people. So revered are the rice terraces to the whole barangay that community efforts to boost environment preservation are very much in practice, and are in fact institutionalized. During the last Sunday of every month, farmers, their wives, children, and other residents of the barangay participate in a monthly tree planting activity on Mount Banahaw. This event is sponsored by the barangay, in collaboration with non-governmental organizations such as *Bantay Kalikasan* and *Luntiang Alyansa para sa Bundok Banahaw (*LABB). These organizations cater to the protection and sustainability of Mount Banahaw. On a clearing at the mountainside around 7 to 8 kilometers (around an hour and half's hike) from the main barangay road, seedlings are planted and monitored each month to support the reforestation of the mountain. One of the perceived positive effects of these efforts is the absorption of floodwaters that flow downhill from the mountain during heavy rains, keeping the soil intact and thus preventing landslides. Attendance in this event is overwhelming each month, with up to 80 residents of the barangay participating.

Conclusion and recommendations

The maintenance and sustainability of the Tayabas rice terraces is attributed to the conscious and constant 'care' that the Tayabasin farmers give to their

farm lands. The study recommends further investigations with regards to the history of terracing in the country. The rice terraces in other neighboring provinces such as Lucban and Sariaya, as well as other rice terraces throughout the Philippines should also be documented so as to provide bases for comparison with regard to rice terracing as an agricultural practice. Furthermore, the examination of the historical, ecological, and agricultural significance of rice terracing in the area could enrich the town's local heritage and boost awareness of how the practice of rice terracing is a manifestation of the complex manners by which farmers impose structure on their environment. Enriching such appreciation for rice terrace farming could boost the younger generation's appreciation for farming, as it was observed that the young people's interest to continue traditional farming practices in the area is quickly declining.

Acknowledgements

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