

**Rice is the life and culture of the people of the Lower Mekong Basin Region**

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**Abstract**

Rice has fed more people over history than any other grain. The domestication of rice probably occurred on the Korat Plateau, northern Thailand, south-western China or in Myanmar's Shan State. Combined, the four lower Mekong countries of Cambodia, Lao PDR, Thailand and Viet Nam, produced over 66 million metric tonnes of rice in 2002, 11.5 per cent of global production. Viet Nam and Thailand are the fifth and sixth largest rice producers in the world.

Today, rice remains the most important staple in Southeast Asia. In 2002, per capita consumption of rice by the region's citizens fell between 103 kg (in Thailand) to 169 kg (in Viet Nam, the second highest global per capita consumption of rice after Myanmar). The Mekong region's inhabitants derive between 44 and 66 per cent of their daily calorie intake from rice alone.

Centuries-long irrigated rice production has modified the Mekong region's landscape spectacularly. The region's most intensely irrigated area is Viet Nam's Mekong Delta, with over 1.6 million hectares under irrigation, fed by some 10,000 km of irrigation canals.

Rice farming in this area has a long history, through which traditional culture and customs associated with rice farming have been formed. Rice and its significance contribute towards the languages, religions and festivals of the region.

Rice, then, permeates every aspect of life in the lower Mekong region. In this presentation, we shall explore these themes, and provide an overview of the place of rice in the lives of the Mekong region's people, their livelihoods, cultures economy and nutrition.

Key words: rice, livelihoods, culture, lower Mekong region.

**Introduction**

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Evidence of rice cultivation can be traced back to at least 4000 BC from imprints of *O. sativa* on pottery shards discovered at Non Nok Tha in Thailand's Korat area (Huke and Huke, 1990). Originally, the people of Southeast Asia cultivated rice as a dryland crop, and only much later did they start to grow it in floodplains and deltas, using the puddling and transplanting techniques developed by their Chinese neighbours to the north (Huke and Huke, 1990).

Since then, rice production has grown exponentially, and in 2002 every man, woman and child on earth ate around 57 kg of rice (FAOStat, 2004). Rice production has been greatly spurred by the development of High Yielding Varieties (HYVs), and improvements to rice production lay at the very heart of the 'Green Revolution'. Its cultivation has altered landscapes and inspired the rise of sophisticated irrigation systems across the world. Its cultivation across seasons has determined the tempo of millions of the world's small-scale farmers, and it has become the backbone of national economies and a source of national pride.

This paper sets out to explore the role of rice in the lives of the Lower Mekong Basin's people, and examines its contributions to their culture, landscapes, economies and livelihoods. In the first paper of this presentation, we provide an overview of rice production in the Lower Mekong Basin (LMB). In the second, we consider the place of rice in the culture and livelihoods of the Basin's people. Finally, we explore a theme of considerable importance to the future of rice production in the region – water and rice.

## **2. Rice in the Lower Mekong - an overview**

### *2.1 Rice production potential and suitability in the LMB<sup>4</sup>*

The LMB covers an area of 60.6 million ha. Much of this land remains uncleared, particularly in Cambodia and Lao PDR. In and of itself, covered land may be the best land use strategy given slope angles. 'Very steep slopes and rugged landforms' make up 7% of the area (Figure 1). 'Steep slopes at higher elevation' account for a further 17%. These steep slopes, moderate-steep slopes and gently sloping land suitable for upland cultivation are used for slash and burn agriculture, some agro-forestry and upland crops including upland rice, maize, cassava and legumes. They are not suitable for irrigation.

17% of the LMB is covered with 'gently sloping land', and agriculture - usually upland crop production and industrial tree crops – covers 39% of it. Much of the undeveloped area is in Lao PDR and eastern Cambodia. Just under half (49%) of the total LMB area is classified as Class 5 land consisting of gentle slopes and flat areas that are potentially suitable for irrigation. 70% of this area lies in northeastern Thailand and Cambodia. Approximately 72% of the watershed in Cambodia is classified in Class 5, 13% of Lao PDR, 65% of Thailand, 11% of the central highlands of Viet Nam and 99% of the Mekong Delta. Despite this, the area actually utilised for irrigation remains small - the utilisation rate for irrigated agriculture currently runs at 13-14 % across the LMB for both dry and wet seasons, although much of this is partial irrigation.

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<sup>4</sup> Unless otherwise indicated, information in this section is derived from MRC, 2003a

LMB Area	Class 4 Land (Gentle slopes)				Class 5 Land (Gentle slopes and flat)			
	% of LMB watershed area	Area of Class 4 land (000' ha)	Area utilised (000' ha)	Area Utilised (%)	% of LMB watershed area	Area of Class 5 land (000'ha)	Area Utilised (000' ha)	Area Utilised (%)
Lao PDR	5	3,051.4	762.1	25	5	2,317.1	944.3	35
Viet Nam. CH	2	1,131.3	580.7	51	1	360.9	129.1	36
Viet Nam MD	0	10.1	6.9	68	5	3,256.2	2,867.9	88
Thailand NE and part N	6	3,600.5	2,695.5	75	20	12,156.6	11,543.2	95
Cambodia	5	2941.3	144.0	5	18	11,242.7	3,481.2	31
Totals	17	10,634.6	4,189.2	39.4	49	29,773.5	18,965.7	64

Table 1: Class 4 and 5 Slope classifications in the LMB. Source: MRC Database. Note: CH = Central Highlands; MD = Mekong Delta. Land classes based on slope, landform and elevation.

Besides slope, soil types also represent a key limitation on what kinds of rice may be grown. The MRC basin-wide land resources inventory for agricultural development uses the FAO/UNESCO (FAO/UNESCO, 1988) soil classification system as a standard (MRC, 2002).

## 2.2 Country overviews

The total area of land cultivated to rice in the LMB during the wet season is currently well over 10 million ha, of which approximately 9.5 million ha is harvested. An estimated 4 million ha of wet season rice receives some form of supplemental irrigation in the LMB. If drainage from one field to another is included in the calculation, the area may be much greater. Included in this estimate is about 750,000 ha of nursery in NE Thailand, Lao PDR, Cambodia and the central highlands of Viet Nam receiving extra water prior to transplanting in June, July or August (MRC, 2003a). Basic figures relating to rice production and agriculture for the LMB countries is presented in Table 3.

	Rough rice production ('000 m.t.) 2002	Rice calorie supply as a % of total per capita calorie supply 2000	Per capita annual milled rice supply (kg.) 2002	Agricultural labour force as a % of total labour force 2000	Rough rice area ('000 ha) 2002.	Milled rice exports ('000 kg) 2002	Share of agric. In GDP 2001
Cambodia	3,740	75	148.8	70	1,966	0	39.2
Lao PDR	2,410	66	167.7	76	690	0	51.3
Thailand	25,945	44	102.6	56	9,990	7,499	8.6
Viet Nam	34064	66	168.9	67	7,485	3,275	24.3
World	576,280	20	57.3	45	147,144	29,489	n.a.

Table 3: Selected rice production figures for the LMB countries. Source: IRRI, n.d.

Thailand is the world's largest exporter of rice, and the world's fifth largest rice producer. Its perfumed rice varieties are considered amongst the finest in the world. Of the Lower Mekong Basin (LMB) countries, Thailand has the most land under rice, most of it concentrated in the country's Central Region. The northeast of the country (Isan), much of which falls within the LMB, contributes 35% of the Kingdom's rice. Rates of irrigation remain low here,

Thailand's agricultural basics				
Land area (000 ha.)	Agricultural area ('000 ha.)	Arable land ('000 ha.)	Irrigated area ('000 ha.)	Share of agriculture in GDP (%)
51,089	20,167	15,867	4,957	8.6

Cambodia's agricultural basics - 2002				
Land area (000 ha.)	Agricultural area ('000 ha.)	Arable land ('000 ha.)	Irrigated area ('000 ha.)	Share of agriculture in GDP (%)
17,653	5,307	3,700	270	39.2

compared to the rest of the country, and efforts to develop irrigation infrastructure typically resisted by a local population deeply suspicious of dam development. Hence, water scarcity is a key difficulty in the cultivation of Isan's rice.

Draught-resistant glutinous rice varieties therefore dominate production, but also typically respond poorly to fertiliser application (MRC, 2003b).

Viet Nam is the sixth largest producer of rice on earth, and the world's second largest rice exporter. Here, rice is grown on 6.3 million hectares of land, representing 82% of the agricultural land area (ADB, 2003). Half of Viet Nam's rice is derived from the Mekong Delta, one of the most intensively irrigated areas on earth. 80 to 85% of Viet Nam's rice for export comes from the Delta (Nhan et al., 2004). No fewer than 10,000 km of irrigation canals deliver water throughout the Delta (Huke and Huke, 1990). In the Delta, two dry season crops (April-August and November-March) are regularly cultivated in flood prone areas, although rice is grown in some fashion all year round where water is accessible and flooding not a problem. Some parts of the Delta are able to obtain three crops a year. Traditional rainfed rice varieties are now rarely planted in the Mekong Delta (MRC, 2003a).

The spectacular development of rice production in the Mekong Delta may be attributed to the widespread use of high yielding varieties and to the development of associated irrigation infrastructure. While it is unlikely that the area of rice cultivation will be increased any further due to land shortages and increasing problems with saline intrusion, outputs could be further

Viet Nam's agricultural basics 2002				
Land area (000 ha.)	Agricultural area ('000 ha.)	Arable land ('000 ha.)	Irrigated area ('000 ha.)	Share of agriculture in GDP (%)
32,549	9,537	6,700	3,000	24.35

increased by addressing post-harvest losses (as high as 13 – 16%) resulting from inefficient post-harvest crop processing techniques (MRC, 2003b).

Most of Cambodia's rice is grown on relatively infertile, poorly drained soils in the flatlands of the Tonle Sap Basin and the upper parts of the Mekong Delta. Although Cambodia has managed to achieve rice self-sufficiency, production is still insufficient for the development of an export market. About 90% of Cambodia's agricultural area is devoted to rice (Riceweb, 2004), and in 2002, 1.9 million hectares were planted. Most rice production is lowland rain-fed (0.9 million ha.). Deep-water/floating rice is also cultivated in areas around the Tonle Sap River and Lake, as well as inundated areas of the Mekong and Bassac near the Vietnamese border (MRC, 2003b). On average, each Cambodian consumes almost 149 kg of rice annually, which contributes 75% towards their per capita calorific supply (FAOSTAT, 2004). Irrigation in Cambodia relies mainly on receding flood waters as a water source. Pumped water supply is also a major source of irrigation water for Cambodian rice farmers. Key production limitations in Cambodia relate to low-quality inputs and management systems (MRC, 2003b).

<sup>5</sup> Figure for 2002.

80% of Lao PDR's cropped area is cultivated with rice (MRC, 2003b). Most of this country's rice production is of glutinous rice – some 85% of rice production is of this variety. Irrigated areas tend to produce far better yields (up to 4 tonnes/ha) than upland rice cultivation (1.5 tonnes/ha). The irrigated area in Laos grew eight-fold during the 1990s, mainly in the Mekong corridor. Irrigation remains rare in upland areas (MRC, 2003b). Lao PDR exports none of its rice, and may have to resort to importing rice during times of drought and flood given the high cost of marketing and a relatively poor infrastructure (Riceweb, 2004). Rainfed lowland rice dominates Laotian rice production (approximately 56% of the rice cultivated area), while the remainder is upland rice cultivation. Irrigated rice accounts for less than 2% of the cultivated area. Dependence on rain-fed production is the biggest constraint to increased rice production in Lao PDR. Agriculture contributed over 50% towards the country's GDP in 2002, the highest such contribution in the LMB.

### 3. Rice, culture and livelihoods in the LMB

Development within the LMB is patchy, with Thailand and Viet Nam clearly the best developed, and Cambodia and Lao PDR lagging somewhat behind. In the latter two countries,

Lao PDR's agricultural basics - 2002				
Land area (000 ha.)	Agricultural area ('000 ha.)	Arable land ('000 ha.)	Irrigated area ('000 ha.)	Share of agriculture in GDP (%)
23,080	1,879	920	175	51.3

agriculture continues to contribute above 35% to national GDPs, while in the former two countries it is less than 25% (in Thailand, agriculture contributes just 9% to GDP). Having said that, more than 50% of the labour force in all of the LMB countries is engaged in agriculture (see

Table 3), and for 80 – 90% of them, rice is the principal crop (MRC, 2003b). Poverty in all of the LMB countries is heavily skewed against the rural population (Table 5). Agriculture contributes around 55% towards the GDP of the Mekong Delta (MRC, 2003b), so the difficulties faced by the Delta's population are obscured in national-level figures.

	Cambodia	Lao PDR	Thailand	Viet Nam
Population '000s (2002)	13,810	5,529	69,193	80,278
Average population growth rate % (1990 – 2002)	2.1	2.4	1.1	1.6
Average life expectancy (2002)	57	54	69	69
% population urbanised (2002)	18	20	20	25
Average urban population growth rate % (1990 – 2002)	5.9	4.7	1.8	3.4
Human Development Index (2001)	0.556	0.525	0.768	0.688
Children underweight for age % <5 (1995 – 2001)	45	40	16	33
GDP per capita PPP US\$ (2001)	1,860	1,620	6,400	2,070
Per capita GNI US\$ (2002)	280	310	1,980	430
ODA inflow mil. US\$ (2001)	409	243	281	1,435
Debt service as a % of GNI (2001)	11	15	0	4
% population < US\$ 1 per day (1990 – 2001)	-	26	2	18

Table 4: Selected national indicators for the LMB countries. Source: UNICEF, 2004; UNDP, 2003.

#### 3.1 Rice and Culture in Thailand

Rice cultivation plays a central role in Thai economy and culture. Thai way of life and culture, especially in rural areas, have been developed around and shaped by rice cultivation for centuries. First trace of rice in Thailand can be dated back 5,500 years ago (about 3,500 BC) which was paddy husk in clay or brick found in Khon Kaen province, northeastern Thailand. Rice variety believed to be from wild variety, probably glutinous nature. Rice farming during that time was primitive, slash and burn style but with the use of farm animal. In 1500 BC, two permanent communities were found, one in upper northeastern plain and the other in lower northeastern plain. These two communities were the oldest in Thailand who used modern tools. Modern rice production technique was introduced to central Thailand by Khmer who controlled greater part of Southeast Asia in AD 900. Till AD 12 century, dry season rice crop was widely grown in Sukhothai, an ancient Thai Capital.

Rice has always been the nucleus of Thai life. Its importance is celebrated by religious and secular festivals organized around the planting and harvesting seasons. In the daily language: in Thai, "to eat" - *Pai kin khao* -- translates to "go eat rice." Many of Thailand's cultural festivals coincide with the planting and harvesting seasons and rice plays an important symbolic role in many religious festivals. There are folk songs and dances about rice ploughing, sowing, harvesting and dehusking. The happiest time is, of course, harvesting. In the past, when modern machine was not available, villagers would gather together to harvest a plot of field. This was because harvesting was highly labour intensive, also late harvest would damage the crop. One can see from old Thai paintings or photographs of whole village gathered together during harvest time, singing happily.

Nowadays, many traditional and cultural practices related to rice and rice cultivation still exist, although declining. The followings are examples of the practices from different parts of Thailand.

#### The Royal Ploughing Ceremony:

One of the most colourful annual events in Thailand is the Royal Ploughing Ceremony, which has been held for more than 700 years. This ancient Brahman rite is held in the public ground in front of the Grand Palace in Bangkok, during the sixth lunar month (around May, as the regular rice-growing season approaches) to produce bountiful crops and boost farmers' morale.



The two main activities in the Royal Ploughing Ceremony are (a) the rite to predict the amount of rainfall and the bounty of the harvest in the coming season, and (b) the actual ploughing of the field by Lord of the Festival (*Phraya Raek Na*) with a pair of ceremonial bulls and the scattering of rice seeds from gold baskets carried by four *Nang Thepi* (fair ladies).

In Thailand, this ceremony has been performed since Sukhothai was the capital. It continued in Ayutthaya and Ratanakosin (Bangkok) period. During the reigns of King Rama I, II, and III the ceremony was purely a Brahmanic rite as it had been in Ayutthaya period, i.e. there was no Buddhist monk participated in the ceremony. Then King Rama IV commanded the inclusion of the Buddhist rite together with the original ceremony in order to bring prosperity to the cereals brought into the ceremonial field and encourage the farmers.

The ancestral masters set the rule that the ceremony must be performed on the best day of the year, with the most auspicious signs as stated in the treatise of astrology. After the royal astrologer calculated and selected the auspicious day for the Royal Ploughing Ceremony, The Bureau of the Royal Households would mark the date into the royal calendar that the king annually gave to his people. The calendar clearly states the date for both rites of the ceremony. The Royal Ploughing ceremony day is announced by the cabinet as a public holiday but the national flag is raised as it is on usual working days.

The Buddhist rite for cereals is conducted a day prior to the ploughing day and it is on that day that the importance of the ceremony is announced, according to the Buddhist Dharma (the teaching of Buddha). This tells how drought was eliminated by the Buddha's power, and this rain enabled farmers to work on their farms. Then there was an announcement to honour King Rama I and finally food wishes to the king and a call to ask all holy spirits to bless and to protect plants in the kingdom that they grow healthily and there is good seasonal rain. After the announcement, 11 Buddhist monks recite a special chant covering all kind of cereals brought into the ceremonial field.

The two parts of the ceremony originally took place on two separate days. Later, the ploughing part was skipped. In 2503, the government had decided to re-establish the ploughing part in order to conserve this great traditional royal ceremony for agriculture. When the ceremony was re-established in 2503 B.E., it was then moved to the Sanam Luang Ground that used to be a ceremonial ground in the reign of King Rama I, II, and III.

The present King of Thailand has presided over this ceremony every year although in recent years, he has delegated the Crown Prince to attend on his behalf. His Majesty the King has conducted experiments in planting rice in his personal rice field in Chitrlada Villa, Dusit Palace, where he lives. After the harvest, he donated 40-50 kg of rice for the ceremony which was separated into two portions. The first portion was distributed into the ceremonial ground. The second portion put in small packs and sent to provinces of Thailand where they were distributed to farmers for good luck.

## Rice Goddesses

In most rice-growing countries of Asia, people believe the spirit of rice resides in the Rice Mother or the Rice Goddess. In Thailand, the Rice Goddess is Mae Posop. Mae Posop and the Balinese Rice Goddess, Dewi Sri, are treated in similar ways-respectful and protective. Just as mothers give food and milk to their children, so Mae Posop gives her body and soul to everyone.

Mae Posop is the goddess who is the protector of rice and farmers in particular will hold various rituals that demonstrate their deep respect and gratitude to her, at varying stages throughout the growing season. They believe this will bring them prosperity and wealth.

The farmers believe that whoever tills and cultivates the soil ought to worship the Rice Mother, for she will endow him/her with health and wealth. Whoever does not worship her will suffer hunger, sickness and poverty. A man who is careful, whether in reaping, threshing or pounding paddy, and does not allow any grains to be scattered over the ground, will be happy and wealthy. If no care is taken and the paddy is allowed to be trodden over or disturbed by animals, or left over in a damp place, the Mother will be angry and leave the careless owner.





At harvest time, it is traditional for Thai farmers to designate certain heads of rice as the Rice Mother. These are cut with a small knife concealed in the hand, so as not to scare the fearful rice spirit. Once this has been done, the rest of the rice can be cut with other implements, ready for a celebratory harvest dance. At one time, reapers in the field conversed in a special form of speech that would be unintelligible to the rice spirit, so that it had no warning of the impending harvest knife. When harvest comes, Mae Posop is thanked and her pardon asked for reaping the rice.

The rice is then cut and carried to the threshing floor. A woman goes back to the stubble and collects some of the fallen rice grains and places them in a little basket. She takes some straw and makes a doll from it (no more than the size of her hand).

Settling it in among the rice grains, the woman calls to the rice soul to come and inhabit the doll. The basket is then carried back to the granary, where it is installed with ceremony. Old people, especially country folk, used to tell their children while taking their meals of rice and condiments to give special consideration to the rice as an act of respect to Mae Posop, the Rice Mother.

When raising the hand to place a spoonful of rice into the mouth, a person must be careful not to let any rice fall on the floor as such an act is deemed bad manners.

Moreover, one must not step over any grain of boiled rice that has fallen on the floor or on the ground. At the end of the meal, young children are taught to thank the Rice Mother with a wai.

When referring to the Mother or to the paddy and rice, no impolite and obscene words are to be used. Any rice which is found wanting in boiling and deficient in quality may not be criticised unless a pardon from the Mother has been obtained beforehand.

When feeding animals either with paddy or rice, whether in a raw state or boiled, it must not be heaped or poured on the ground but be placed properly in a vessel. Failure to do so or allowing the paddy and rice to be scattered and strewn on the ground is an act of disrespect to the Mother. She will be angry and leave the person who is so disrespectful.

#### Rice and rituals:

Rice is the only crop that Thai farmers arrange to give “blessings” at every stage of its life from planting to harvesting. The most important rituals, however, lie after harvesting season and before the beginning of the new farming cycle.



Rituals before planting aim to pay respect and worship the goddesses and ancestors to protect the families from any danger to their lives and properties. These rituals include First Ploughing, Lieng Pee Ta Hag, Tok Gla, First rice transplanting, Pak Khao Ta Hag, and Pak Kok Ta Hag ceremonies.

Rituals before harvest: the rituals are normally performed during growing season and before harvesting to prosper rice production and chase away harmful insects. These rituals include Lai Nam, Pak Ta Laew, Suad Sangkaha, Rub Kwan Mae Posop, etc.

#### Rituals during and after harvest:



These rituals are performed to show gratitude to rice as major food for farmers. These rituals include Ruab Khao, First harvesting, Chern Kwan Khao, Wang Khao Tang Nam, Plong Khao, Khon Khao Kuen Yoong, Tang Lom Khoa, Pid Yoog, and Perd Yoong ceremonies.

In Isan or the northeastern region of Thailand which covers an area of 106 million rai, including 39 million rai of ricefields, rice has been involved in the people's way of life, and merged into their culture and beliefs. There are several rituals related to rice. First, there is the ritual of growing rice before the farmers transplant rice seedlings, including putting dust in the field, sacrificing and venerating the goddess of rice and Phi-ta-hag, the first ploughing ceremony and first transplanting rice seedling ceremony. The rituals of harvesting rice include rice cremating ceremony to show respect to the goddess of rice and earth. Before the farmers store rice in the storehouse, there is a ceremony of calling back the rice spirit.

Besides the rice producing process rites, rice is also involved in ceremonies involving spirits.

The other ceremonies are Boon bung fai and Hae nang meaw to ask for rain. When it rains, there is the Hag-na ceremony for moral support and a welcome to the rice growing season. On Boon kaw sak, people flock to the temple to make merit, and bring rice back to the field for a prosperous field. At Boon Auk-pun-saa, or the end of Buddhist Lent, farmers light lanterns and offer the Buddha developing ears of paddy. After harvesting, there is Boon home kaw.

From generation to generation, Isan people have continued telling several legends concerning rice. The detail of legends may be different from other areas, depending on local beliefs and culture. Distinctively, Isan custom and relationship systems are benevolent, and friendly to everyone. If rice is totally damaged because of flooding or drought, those affected farmers can borrow, share, or exchange rice grain among relatives and neighbours, both within and outside their communities. All of these related rice traditions, ceremonies, legends, beliefs, and relation systems not only illustrate rural people's way of life but also reflect the relationship between humans and nature.

#### *Rice in Music*

Folk songs can be related to the stages of rice farming, from the beginning of the rice-growing season until after harvest. When rains of the wet monsoon came, ploughing and sowing could get underway, but if the rains were delayed, the farm folk would put a cat in a creel and parade it around the village to ask the gods for rain.



This song is sung by a leader who is answered by a chorus, and usually begins with "Oh Mistress Cat" and ends with "and the rain comes pouring down, and the rain comes pouring down".

The lyrics contain coarse language repeated again and again, and when the parade arrives at each house in the village, the owner splashes water on the cat. It is believed that the cat, an animal that hates water, placed in a creel, a basket for aquatic animals, and the coarse language act as a secret method that will induce the gods to send the rain.

Such simple ceremonies accompanied as they were with merry making bespeak the optimistic outlook on life and the world that so typified traditional agrarian society.

And when the rice is ready for harvest, the owner of the field to be harvested first would prepare food for the neighbours, who would come to help cutting, binding, and carrying the sheaves of rice. Exchanging labour among themselves like this, the farm folk moved from field to field until they had brought in the harvest of everyone in the village.

To relieve their weariness as they bent over to cut the ears of rice, the farm folk would sing "harvest songs" back and forth to one another, and when they took a break from work or when the harvesting was done, they would sing and dance holding sheaves of rice in one hand and sickles in the other.

When the rice had been harvested, there was still the work of threshing and storing the crop. To lighten their labour on the threshing floor, farm folk would sing to one another songs in parts like "turning the straw", "sifting the rice" and "gathering the grain".

After all the work of the harvest had been completed, the farmers saw that the sweat of their brows had been transformed into rice in the granary, and with their cares and worries at an end, they gave themselves up to joyous celebration.

With the passage of time, rural life has changed just as life in all other segments of society. All sorts of machinery have appeared in the fields. And farm folk have adapted the new ways. Happily, though, despite all the changes, many Thai farmers still have a place for songs in the open fields.

## **Cambodia**

### *Rice and the demise of Angkor Wat?*

Angkor Wat lies at the heart of Cambodian culture and identity. Lying on the edge of Southeast Asia's biggest lake, the Tonle Sap Lake, Angkor Wat was constructed by a succession of Khmer kings between the 7th and 13th Centuries. In its heyday, the city covered some 1,000 km<sup>2</sup> and supported a population of 750,000 people. To the east of Angkor Wat lie the Kulen Hills, Water draining from these highlands were captured by Angkor's engineers in an elaborate system of irrigation canals for the purposes of fishing, transport, and, most importantly, rice irrigation – the very heart of the City's economy.

In 1431, Siamese invaders sacked the city, and it is generally believed that it was only at this point that Angkor Wat collapsed and succumbed to Cambodia's forests. More recently, however, it has been suggested that the city's infrastructure was beginning to fail before the invasion. Archaeological evidence seems to indicate that the network of reservoirs and canals became too elaborate to sustain. Rivers had been diverted, directional flow changed, and man-made channels engineered but, as forest was felled to clear more land for rice, problems of sedimentation resulted in siltation of the complex system, a problem that eventually became insoluble. Population pressures and water shortages eventually resulted in people migrating south, and the city's decline.

## **Roles of Rice in Connection to Lao Culture.**

### *Language*

For many Lao words and phrases spoken or used daily in Lao culture, there are connections of their meanings determined literally and figuratively in association with and reference to rice. These connections have one implication suggesting a gradual influence of rice over the long period of time.

Since the early settlement of the Lao ancestors, rice was already the existing crop and has always been the most important food for their survival, and social being. In the old days where trade and economy not yet introduced, most of people lives were put back in the rice fields causing gradual development and interaction between people and rice in intimate and deepening manner particularly in relation to events associated in rice field. After work when people are back at home in village, social interaction was made, and experiences were shared mainly about rice and field works. Eventually with gradual development of phrases and words associated with rice used over times in the social interaction, language has been developed by adopting influences of rice.

Buabarn Vorakhounh, (1998).

Some examples are shown below:

For every day speech in Lao PDR and Thailand, the phrase eating rice is synonymous with eating food. That is food = rice. The message carries meaning of rice is equally important and necessary as food. The old Lao saying (Proverb) which has passed through generations describes distinctive difference of Lao people over other nationality that "Living in stilted house, eating sticky rice and playing Khene" is a tradition signifying the Lao origin. Buabarn Vorakhounh, (1998).

According to Buabarn Vorakhounh, (1998), the word Kam Pan (meaning fist) in Lao PDR originated from the phrase: "holding sticky rice in tight hand". Although there is no hard evidence suggesting how this word (Kam Pan) evolved, and developed, relevant explanations made by many local historians, elderly, and authors of books indicates the strong connection of meaning associated with such phrase.

Many villagers in rural area of Laos, people often end their greeting with their usual phrase as Kin Khaow Kin Num Leow Bor? (have you eaten rice or drunk yet? a literal meaning).

### *Festivals*

Many national and religious holidays in Lao PDR are designated by festivals associated with meaning of rice, cultivation patterns, and rice field activities. Explanation of rice in relation to the festivities is very complex but it can be described in some examples listed as follow:

March - Boun Khoun Khao - A harvest festival celebrated at local temples and Wats (temples).

May- Bun Bang Fai (the rocket festival). It's a great pre-Buddhist celebration with plenty of processions, music and dancing, accompanied by the firing of bamboo rockets to prompt the heavens to send rain so farmer can grow rice and crops. Belief in the rain god is less now than in former times, the Lao still respect this tradition and continue to prepare the rocket festival as one of the most significant activities that takes place before of the season of rice cultivation. The higher a rocket goes, the bigger its builder's ego gets. Designers of failed rockets are thrown in the mud. Parades, songs, dances and partying everywhere. This dramatic festival lasts two days and also celebrated in north east Thailand. "It is the one means for human beings to communicate symbolically with the god to request rain".

July- Khao Phansao (also Khao Watsa, full moon) - Marking the beginning of the traditional three month "rains retreat" during which Buddhist monks are expected to station themselves in a single monastery. At other times of year they are allowed to travel from Wat to Wat or

simply to wander in the countryside, but during the rainy season they forego the wandering so as not to damage fields of rice or other crops.

September - Khao Salak (Full moon). This is the end of the rice harvest. Buddhist people celebrate their harvest by offering rice and fruit to the temple as thanks to their spirit and wish to have a better harvest for next year.



November -The Boon That Luang (Festival of the Great Stupa) is celebrated during the full moon of the twelfth lunar month. It marks the end of harvest (rice), but it is also a celebration of Laos's greatest national monument, the Pha That Luang, or Great Stupa, in Vientiane.

<http://www.settlement.org/cp/english/laos/holidays.html>



#### *Role of rice in food/drink tradition*

For many traditional deserts, foods, and drinks known to Lao persons, their availability depends largely on the rice harvest season or certain time of the year. Some food or deserts mainly made of rice can only be available during the rice harvest season. There are many reasons justifying this tradition in Lao PDR, but for one reason, the newly cut, or harvest rice is given a better grade and credit which can generally be described as softer, sweeter, more flavoured, and testier than old harvested rice kept through the year, particularly the sticky rice. The sound of this explanation can be found in comments made commonly by Lao person particularly among the elderly. Kao Larm, and Khao Sung Khaya are some classic examples familiar to all Lao persons which are acknowledged that, "the best time to buy and eat them should be from March to May".

Khao Larm (Rice in Bamboo) is one of the classic and traditional dishes of sticky rice cuisine in Laos. The rice is cooked with coconut milk, then mixed with sweet potatoes and sugar and is packed into a bamboo pipe then grilled.



Along with Khao Niaw (Sticky Rice) there is another essential ingredient in a Lao meal, and one which the Lao tend to use as an ethnic marker. This is Pa Daek, a highly pungent fermented fish sauce. On the back verandah of every Lao country villager's house you will find an earthenware jar of Pa Daek. Books and tourist brochures are often likely to refer to Laos as the "Land of a Million Elephants", but ordinary Lao are more likely to call it the land of "Khao Niaw and Pa Daek".

Lao Khao (Lao Whisky) made of sticky rice is a fine traditional product that is symbolic to Lao culture. Apart from being just a whisky, Lao Khao is used as an integral part of ceremonial processes particularly at the Baci (good luck ceremony), spiritual worships, etc. The most important stage of these practices depends significantly on Lao Khao.

Lao Lao is found all over the country – it is rice whiskey, and the flavour and methods of manufacture varies all over the country. Visitors to the Pak Ou caves near Luang Prabang will probably stop at the well known village of Ban Xang Hai,





where they distill rice whiskey – which you can see being made on the banks of the Mekong river.

<http://visit-laos.com/food/drink.htm>

Rice wine is made of sticky rice. Un-milled grain is used as the main ingredient fermented with sprit power and preserved in the jar for preparation of rice wine making. The rice wine is one of the most popular drinks inherited by hundred generations in Lao culture offering distinctively sweet taste, and yellowish or sometime dark red colour.



Rice Cakes (Similar to rice crackers), are a favourite cuisine commonly and traditionally consumed by the Lao throughout the country. The origin of rice cake making comes from Luang Prabang province in Laos where the extensive and various uses of rice cake for food can be found.



Rice paper made from the sticky rice boiled, mashed, mixed finely with water and reshaped into thin paper is one kind of traditional food commonly used for Feu (Vermicelli noodle), and spring rolls, a cultural influence from Vietnamese and Chinese cuisines since their earlier settlement hundred years ago.



### ***Rice and ritual practices***

Rice, the ancient, almost perfect food that epitomizes the earth's generosity or religious connection in Laos and Thailand, offering practices for almsgiving to monks. The rice offering is made daily to monks in early morning throughout the country and sometimes together with foods, fruits, money ...etc. Similar offering can also be seen in other religious ceremonies carried out either inside or outside temples (Wat).



The Baci ceremony is a uniquely Lao Boun (ceremony) and celebrates any auspicious occasion - marriage, birth, achievement or the end of an arduous journey for instance.

The ceremony dates from pre-Buddhist times and is therefore animist in origin. It is centred on the Pha Khouan (Rattan table), a designer-tree made from banana leaves and flowers (or, today, some artificial concoction of plastic) and surrounded by symbolic foods. The most common symbolic foods are eggs and rice - symbolizing fertility and fecundity.

### ***Rice and cooking tools***

Sticky rice baskets are a cultural product that evolved from the influence of sticky rice preservation techniques which eventually becoming a national symbol of a container for steamed rice. The basket is made of thin pieces of woven bamboo which helps to prolong moisture, heats and maintains the aromatic smell of the steamed rice, a natural practical technique that is effective, and advantageous.



Steaming pots and baskets are products of rice steaming practice, a method which evolved from old rice steaming techniques from Lao PDR and Thailand.



#### *Tradition and culture*

As mentioned earlier, the domestication of rice probably occurred in Southeast Asia. Once puddling became common, and irrigated rice production more widespread, its transformation of the Mekong's landscapes was profound. Angkor Wat's irrigation systems can be observed from space, and provided this spectacular civilisation with water for both domestic use and paddy rice. The FAO (2004) has suggested that rice cultivation may have contributed to the formation of sedentary agricultural communities – because of the work involved, the need to clear land for cultivation, the need to synchronise cropping patterns against floods etc. Today, rice permeates the cultures of the Mekong's people, from the water puppetry of Vietnamese rice farmers (dated back to 1121), to Viet Nam's New Rice Festival celebrated by the Co Mo ethnic group. It is the basis for the distillation of rice wine, spirit and vinegar, and an accompaniment to virtually all Southeast Asian recipes. It is a basis for identity from the pride Lao PDR invests in its sticky rice, to the sometimes rigorous protection that Thailand affords its perfumed varieties lest they are grown outside the country.

#### *Agriculture and water in the LMB*

80% of all water abstractions in the LMB are agricultural in nature (MRC, 2003b). As agriculture expands in the basin, this proportion may not alter, but the actual amount of water utilised will increase substantially. This issue is of particular interest to the Mekong River Commission. Scenarios for such a future have yet to be developed, but the situation in the Mekong Delta is a case in point. During the 'critical period' (February – May) when river flows are at their lowest, rainfall at its least and irrigation demands at their highest, the hydraulic pressure of the river declines to such an extent that saline water from the south China sea advances up to 75 km up the Mekong (MRC, 2003b). Saline intrusion is so serious that it has given rise to a whole shrimp farming industry, which competes directly with agriculture for water and land resources.

59% of the LMB watershed area remains uncleared and, agronomically, natural forest may still be the largest consumer of water in the basin. Cultivated perennials consume more water in the dry season, than annuals, especially if irrigated. Only small areas of perennial crops are grown in the LMB compared with annuals, although the area of fruit tree areas has not been properly documented because of the small number of trees on each property.

Abstractions from the Mekong River in the LMB are not limited during the wet season when flow levels are high. However, there may be constraints on water use during the dry season, especially in regional drought years. A rough calculation of water consumption by agricultural activities during the critical months of February to May for the LMB is presented in Table 6. Crop areas are based on Nesbitt et al., 2004. To complete the table it was presumed that all fully irrigated dry season rice used water at a rate of 0.8 l/sec/month and that crops were not fully cultivated each month. Different water utilisation rates were assigned to other crops, animals and fishing activities (Table 13) (Nesbitt et al. 2004). Note that, using the assumptions in Tables 6 and 7; agricultural activities in the Mekong Delta of Viet Nam consumed twice as much water over the four month period compared with the other four watersheds together.

Area	Crop area 000' ha	Month			
		Feb	Mar	Apr	May
<b>Mekong Delta, Viet.</b>					
All crops	3792	1236	928	644	633
<b>Central Highlands, Viet.</b>					
Irrigated rice	51	40.8	40.8	40.8	
Coffee	300	120	120	120	120
<b>Cambodia</b>					
Fully irrigated rice	55	44	44	44	44
Recession rice	200	80	40		
Upland crops	48	19.2	19.2	19.2	19.2
Fruit trees	164	65.6	65.6	65.6	65.6
<b>Thailand</b>					
Irrigated rice	67	53.6	53.6	53.6	
Fruit trees	381	152.4	152.4	152.4	152.4
<b>Lao PDR</b>					
Irrigated rice	87	69.6	69.6	69.6	
Upland crops	43	17.2	17.2	17.2	17.2
Coffee	42	16.8	16.8	16.8	16.8
Totals	1274	679.2	639.2	599.2	435.2
LMB large animals	24 million	13.9	13.9	13.9	13.9
Grand total for LMB		1915	1567	1243	1068

Table 6: Water consumption (m<sup>3</sup>/sec) during critical period, 2000. Source: Nesbitt et al., 2004. Note: figures for the Mekong Delta based on estimates made by the Viet Nam Sub Institute of Water Resources Planning; all other estimates by Nesbitt et al., 2004.

Activity	Water flow (l/sec/ha)	Water req. (m <sup>3</sup> /ha/month)	Crop irrigation life (months)	(m <sup>3</sup> /ha)
Irrigated rice	0.8	2074	3.5	7258
Upland crops	0.6	1555	4	6221
Fruit trees	0.4	1037	4	4147
Coffee	0.4	1100	4	4400
Recession rice	0.4	1037	3	3110
Fresh water fish	2.3	6000	4	24000
Shrimp production	0.3	800	4	3200
Animal production	13.9l/sec	1.5m <sup>3</sup> /head/month	4	144mill m <sup>3</sup> total

Table 7: Assumptions for calculating water use in Table 6. Source Nesbitt et al., 2004.

### *Concluding comments*

Poverty and livelihood in the LMB also have temporal expression, many regions throughout the LMB experience regular food shortages. Half of Cambodia's provinces may have annual rice shortages and the provinces of Kandal, Kampong Cham and Kampon Speu experience perennial food deficits. In Lao PDR, food shortages can last for up to six to seven months of the year, and longer for ethnic minorities. Shortages are particularly acute between the planting and harvesting of the rainy season rice crop, and per capita calories deficits at this time can be large, representing as much as 10% of the minimum daily requirement.

The dominance of rice in regional diets is a major cause of malnutrition, especially amongst children (MRC, 2003b: 67). Over-reliance on the crop has meant that the cultivation of other, nutritionally more rewarding perennial crops has been neglected. In addition, in and of itself, rice is not an adequate source of nutrients. The predominance of other starchy staples amongst the poor gives rise to similar problems all over the world.



Whatever the case, rice fills an enormous role in the lives, livelihoods, food security and culture of the Mekong's people. There are many benefits to focussing on rice as a key livelihood source (after MRC, 2003a):

The influence of rice production in the Lower Mekong Basin (LMB) is profound. We have shown the extent of rice cultivation in the region, and considered rice's dominance of the agricultural sector in the LMB. We have considered the immense contribution of rice to the livelihoods and cultures of the LMB's people. Finally, we have outlined water usage by the agricultural sector in the Basin.

As the basin's economies continue to grow, rice outputs for both domestic and export consumption will also continue to grow. In all likelihood, rice will continue to feature highly in the cultures, economies and livelihoods of the Basin's people.

This expansion will have profound implications for the Basin's environment and water usage. The challenge remains to balance these issues between the needs and aspirations of the Basin's people against the maintenance of unique hydrological and ecological systems.

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