



Naming of traditional rice varieties by farmers in the Lao PDR

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Abstract

The Lao Ministry of Agriculture and Forestry (MAF) and the International Rice Research Institute (IRRI) jointly collected rice germplasm in the Lao PDR between 1995 and 2000. Among the 13192 samples collected, there are 3169 distinct variety names. Sometimes, the same variety is called by different names by different ethnic groups; furthermore clearly different varieties have the same name. Lao farmers assign names to traditional varieties that relate to the production ecosystem, endosperm type, and maturity. The name also often indicates a variety's particular morphological features or other unique characteristics. Varieties are also named for plants, flowers, fruits and animals. Resistance to or tolerance for commonly occurring stress factors like drought, floods, lodging, birds, weeds and adaptation to soils are also reflected in some rice variety names. Use of this information can help select germplasm for rice improvement.

Introduction

Rice is the most important crop in the Lao PDR and accounts for about 67% of the per capita calorie intake. We have already reported the collection, classification and conservation of rice varieties in this country (Appa Rao et al. 2001). While collecting germplasm samples, we recorded information from farmers about the origin of the different varieties, their special traits and significance, including the vernacular names and their meaning. Imperfect as literal translations may be, names do provide an insight into the diversity of rice varieties. Furthermore, in the first instance, the diversity of variety names may be used, with care, as a proxy for genetic diversity.

Variety names were written in the Lao language and an agreed transliteration into English was developed. The meanings of variety names were obtained from all possible sources, including Lao extension officers and researchers who understood both Lao and English. A variety name was translated literally, based

on the explanation by farmers. For example, the red colour of glumes is often described in terms of the liquid from chewed betel leaf, which is dark red. Aroma may be indicated by the names of aromatic plants like sandalwood, or aromatic flowers like jasmine.

Naming of varieties

Components of variety names

Most rice variety names in the Lao PDR have three elements: a basic name, a root name, and a descriptor. The basic name is *Khao* and means rice. However, there are several very common root names: *Khao na* (lowland), *Khao hay* (upland), *Khao niaw* (glutinous) and *Khao chao* (nonglutinous). The third element, a descriptor name, allows farmers to identify particular rices further within different groups. For example, the variety name *Khao niaw do* refers to a glutinous, early maturing variety, and *Khao niaw kang* indicates a

glutinous variety with medium maturity (*kang*). Quite often, the word *Khao* is understood rather than formally included in the name, and so the name recorded was only the root name and descriptor, such as in [*Khao*] *Phae deng* (a red, profusely tillering variety).

Variety names with just one descriptor name are most common, but occasionally they may have two descriptors. Some examples are *Chao aan tam* (nonglutinous, soft, dwarf), *Khaw pom kondam* (white, globular grain, black apiculus), *Peek khaw gnay* (winged, big white grain), *Do deng noy* (early, red, small grain), *Do deng tam* (early, red grain, dwarf), and *Chao laosoung dam* (nonglutinous, Laosoung, black grain). Some names indicate the country of introduction, such as *Khao phama* (Myanmar), *Khao thai* (Thailand), *Khao viet* (Vietnam) and *Khao gnip-pon* (Japan).

These name components are easily understood and such varieties are exchanged between Lao farmers. They know the specific characteristics of each variety, and can relate a variety to its particular management requirements, since naming of varieties is an integral part of variety management in many cultures (Roder et al. 1996; Bellon et al. 1997; Brush and Meng 1998).

Variant forms of root names

Naturally occurring variants are selected by farmers, tested for their performance, and maintained as new varieties. Some of the varieties are grown extensively because of their wide adaptation or good grain quality. For example, the variety *Khao kay noi* is a rainfed lowland variety valued for its excellent grain quality. It is grown extensively in the Houaphan and Phongsaly provinces in the northern region (see Figure 1 in Appa Rao et al. (2001)). Nine different forms of this variety were found that differ for glume colour, with additional descriptors for red (*deng*) or yellow (*leuang*) among others. Similarly the variety *Khao sanpatong* developed in Thailand is extensively grown in rainfed lowland conditions throughout the country. It has nine forms that differ for maturity, aroma, and other characters. Variation in the shape, size and colour of rice grains is reflected in the variety name *med* (grain). One of the most diverse upland varieties is *Phae* (tillering) that is grown almost throughout the country. It has 38 different forms that differ for several characters.

Distinct variety names

Among the 13192 samples collected, we recorded

names for 12404 of these; variety names could not be obtained for 789 samples (6%) (Table 1). In the Lao PDR, there are 47 ethnic groups who speak different languages, and they are not widely understood. Hence, some of these variety names could not be translated. Among the samples for which names were given, 1414 samples have ethnic names and 151 samples represent specific ethnic groups. However, most of the variety names in the Lao loun language (the most widely spoken) could be translated and meanings derived. Among the 12404 samples with names, there are 3169 distinct names.

The number of distinct variety names varied considerably in different provinces. The highest number of names (462) was found in Luang Prabang, one of the largest provinces and where the area under upland rice is greatest (Table 1). The maximum number of samples was also collected in this province. The lowest number of distinct variety names (161) was recorded in the Xaisomboun Special Region. However this was also the region where we collected fewest samples because of the inaccessibility of some areas.

What is more interesting, however, is the number of unique names found among rice varieties within provinces, and their frequencies. For example, among the 462 different names in Luang Prabang, 191 were recorded from that province only, representing 41% of the names recorded there; furthermore, 158 of these were single occurrences. Overall, the unique names in Luang Prabang province represented 21% of all named samples collected in the province (Table 1). The highest occurrences of unique names were recorded in the provinces of Attapeu (62%) and Sekong (55%) in the southern region, and Phongsali (55%) in the northern region. There was also a high proportion of single name occurrences in these provinces, and the samples with unique names represented as many as 46% of the samples collected in Sekong. As expected, the number of different names and proportion of samples with unique names was lower in Vientiane Municipality and some of the other central region provinces where the adoption of improved varieties is somewhat higher than in the rest of the country.

The most common root names were *kam* (black), *chao* (nonglutinous), and *deng* (red) occurring 351, 314 and 263 times, respectively in all provinces. The name *peek* (winged or long glumes) had 166 occurrences. Although variety names are mostly distinct, and varieties often have unique characters associated with the name, the same apparent variety is sometimes called by different names by different ethnic

Table 1. Distribution of rice variety names in the Lao PDR.

Province	No. of samples collected	No. of samples with names	No. of names	Unique names**			No. of unique name samples in province
				Number	as % of all names in province	No. of single occurrences	
<i>Northern region</i>	5915	5613		1120		968	
Luang Prabang	1244	1162	462	191	41.3	158	21.1
Sayabouly	984	949	416	168	40.4	140	23.7
Luang Namtha	858	798	406	202	49.8	190	27.7
Oudomxay	848	814	343	116	33.8	99	17.4
Bokeo	686	665	299	103	34.4	87	19.8
Phongsali	664	646	373	204	54.7	177	37.3
Houaphan	631	579	300	136	45.3	117	29.0
<i>Central region</i>	4625	4321		613		513	
Savannakhet	989	968	358	148	41.3	117	21.0
Khammouane	867	840	296	102	34.4	86	15.4
Vientiane Province	787	717	331	108	32.6	89	19.8
Borikhamxay	594	560	273	91	33.3	77	19.8
Xiengkhouang	560	535	223	74	33.2	64	17.6
Vientiane Municipality	486	380	197	48	24.4	43	16.1
Xaisomboun Special Region	342	321	161	42	26.1	37	17.1
<i>Southern region</i>	2652	2469		583		482	
Champassak	842	773	283	97	34.3	77	15.8
Saravane	774	741	335	144	43.0	110	26.3
Attapeu	640	596	336	209	62.2	180	42.3
Sekong	396	359	243	133	54.7	115	45.7
	13192	12403	3169*	2316		1963	

* This is the total number of different names across all provinces, and is not the sum of this column. 853 (26.9%) names are found in more than one province.

** Recorded in a single province; a unique name may be recorded more than once within a province.

groups. Conversely, varieties with different morphological and physiological characters are called by the same name. For example, the variety *Khao kam* (black rice) differs for a large number of characters, but farmers use the same name as long as the pericarp is black or purple, and ignore all other characteristics. Similarly, they use the name *Khao peek* (winged rice) for any variety that has long glumes. Hence, there may be more varieties than the list of names indicates.

Classification and names of varieties

Lao farmers use a functional system to name varieties that is based on useful characters. They also use easily distinguishable morphological characters to classify varieties: glume colour (white *Khao khaw*, yellow *Khao leuang*, red *Khao deng*, or striped *Khao lay*); spikelet size (big *Khao med nyai* or small *Khao med noi*); spikelet shape (long *Khao med nyao* or globular *Khao med pom*); and pubescence (hairy *Khao khai*, glabrous *Khao bo mee khai*). Agronomic characters

like plant height (tall, short, dwarf) and tillering ability (many tillers, excessive tillering) also feature in some names, as do the names of animals, plants, flowers, fruits and various other plant characters (Table 2). Some names indicate higher yield potential (broken store *Lav tek*, heavy grain *Phannak*, twelve grains yield one million *Moon lan*). Farmers use names like *Gnod nang* (superwoman) and *Gna thao* (grandmother) to indicate high yielding varieties.

Production ecosystem

Generally, different varieties are grown under rainfed lowland and rainfed upland conditions, and they differ considerably in morphological, physiological, agronomic and grain characters. Traditional varieties are mostly grown in the uplands where mixed populations consisting of several phenotypes are common, each having a specific name. This diversity in upland varieties is a deliberate practice of mixing several phenotypes to reduce the risks in production due to climatic variability, and incidence of pests and dis-

Table 2. Some common descriptions used by Lao farmers for rice varieties.

Group	Names [<i>Khao</i> +]
Animals	chicken (<i>kay</i>), buffalo (<i>khuay</i>), rhinoceros (<i>had</i>), monitor lizard (<i>len</i>), wild dog (<i>ma nay</i>), brown bear (<i>meuay</i>), cow (<i>ngoua</i>), rat (<i>nou</i>), deer (<i>leuad fan</i>), rhinoceros (<i>leuad had</i>), bird (<i>leuad nok</i>)
blood	dog (<i>leb ma</i>), black bear (<i>leb mee</i>), dragon (<i>leb nguea</i>), bird (<i>leb nok</i>), elephant (<i>leb xaang</i>)
toes or claws	turtle shell (<i>ked tao</i>), palat fish bone (<i>kang palat</i>), cow hair (<i>khon ngoua</i>), turtle back (<i>lang tao</i>), cow's milk (<i>nom ngoua</i>), cow dung (<i>khie ngoua</i>)
others	frog's eyes (<i>ta khiat</i>), liver of brown bear (<i>tab meuay</i>)
tails	chicken (<i>hang kay</i>), dog (<i>hang ma</i>), horse (<i>hang maa</i>), otter (<i>hang nak</i>)
teeth	cow (<i>hang ngoua</i>)
Birds	buffalo (<i>kheo khuay</i>), dog (<i>kheo ma</i>), horse (<i>kheo maa</i>), pig (<i>kheo mou</i>)
Fish	crow (<i>ka</i>), small parrot (<i>nok keo</i>), parrot (<i>nok khok</i>), big owl (<i>not khouw</i>), dove (<i>nok khoua</i>), rice bird (<i>nok peed</i>), quail (<i>nok tha</i>), wild quail (<i>nok khoum</i>)
Flowers	guppy (<i>pa bou</i>), do (<i>pa do</i>), perch (<i>pa kheng</i>), scorpion (<i>pa lad</i>), eel (<i>pa lay</i>)
Fruits	tiny carp (<i>pa siev</i>)
	aster (<i>dok chan</i>), hien flower (<i>dok hien</i>), aromatic flower (<i>dok hom</i>), golden flower (<i>dok kham</i>), wild sugarcane flower (<i>dok louw</i>), yellow flower (<i>dok leuang</i>), jasmine flower (<i>dok mali</i>), coconut flower (<i>dok phao</i>), gardenia (<i>dok phoun</i>), orchid (<i>dok pheung</i>)
	kaffir lime (<i>mak khie houd</i>), cucumber (<i>mak teng</i>), almond (<i>mak bok</i>), sponge gourd (<i>mak bouab</i>), red fruit (<i>mak deng</i>), fig (<i>mak hay</i>), mulberry (<i>mak mone</i>), bottle gourd (<i>mak nam tao</i>), lemon (<i>mak nao</i>), sesame (<i>mak nga</i>), passion fruit (<i>mak nod</i>), coconut (<i>mak phao</i>), banyan (<i>mak pho</i>), jute (<i>mak po</i>), sugar palm (<i>mak tan</i>), cowpea (<i>mak thoua</i>), durian (<i>mak thoua lien</i>), rattan (<i>mak vay</i>), star gooseberry (<i>mak fay</i>), orange (<i>mak kieng</i>)

eases. Different varieties are selected panicle-by-panicle at harvest, and stored in that way until planting in the next season when the landrace is once again constituted. Varieties in the landrace generally have the same height and maturity, but differ for panicle or grain characters or both. We identified as many as 13 different phenotypes in one field. In the rainfed lowlands under flooded conditions, farmers often grow more than one variety in a field but as a mosaic of more or less homogeneous stands.

However, some traditional varieties are grown under both ecosystems. In Xiengkhouang province in the upper central region (see Figure 1 in Appa Rao et al. (2001)), a variety *Khao hay-na-suan* (upland, lowland, gardens) is grown mainly under upland conditions but is also regarded as being suited to the lowland ecosystem. This variety is usually dibble-seeded in elevated areas with relatively level land. About 3–4 weeks after seeding, excess seedlings are uprooted and planted in lowland fields. A similar variety, *Phae deng* was recorded in Houaphan province in the north of the country. Other varieties grown mainly under lowland conditions are sometimes grown also under upland conditions; the variety *Dok tiaw* (Tiaw flower) collected in Vientiane Municipality belongs to this category. The traditional

names given to some of these varieties often reflect this broad adaptability. These varieties seem to be primitive and not yet differentiated into specific lowland or upland types; they are adapted to both flooded and upland conditions. They are relatively uncommon in the collection.

Endosperm type and grain quality

Lao farmers give names to varieties based on endosperm type: *niaw* (glutinous) and *chao* (nonglutinous). Some of the traditional varieties are intermediate between glutinous and nonglutinous forms, and their amylose content ranges from 5–15%. Grains of such varieties are supposed to be very hard after steaming, while they become very sticky after cooking, just like glutinous rice.

One of the most important criteria for choosing a variety is grain quality. Variety names indicate quality of the grain, such as *Khao hav* (grain cracks) or *Khao pheng* (floury endosperm), for example. The quality of cooked rice is indicated by adjectives like *oon* (soft); hard grain is called *Khang loud hak* (broken jaw). Good grain quality and aroma is called by such romantic names as *Nang nuan* (sweet and soft), or *Hom nang nuan* (sweet smelling soft lady). Other

names for good quality are *Leum phua* (forgot husband) and *Pha nya leum kheng* (king forgets soup). The word *ma* (dog) is often linked to descriptions of eating quality. For example, *Khao mangyeng* (a poor quality variety) means ‘rice watched by dog’, based on the belief that a dog will eat rice only reluctantly, and only sit and stare at it. *Ma thoum* or *Ma teum* (dogs wake up) and *Ma keu* (dogs rush) indicate good quality. The name *Hom sam heuan* (three houses) also indicates aroma of the cooked rice.

One intermediate variety is called *Khao chao niaw*. It is regarded as nonglutinous, but becomes sticky after cooking. The eating quality of intermediate types is considered inferior. Such varieties were found occasionally around Kham district in Luang Prabang province (northern region), and Outhoumphon in Savannakhet province in the south. The keeping quality of cooked rice is very important, as most Laotians steam rice in the morning and carry it in woven bamboo baskets to the field or workplace for lunch (Roder et al. 1996). Most Laotians prefer rice that remains soft even after cooling; the opposite type is called *Ea bood* or ‘spoiled’.

Stress tolerance

Lao farmers have selected varieties that have resistance to commonly occurring stresses such as drought or flooding. Drought is important in both the rainfed lowlands and uplands. Drought tolerant varieties are called *Bo ngo nam* (does not care for water), *Khok* (upper terrace), *Ea phon* or *phon* (ant hill), among many others. Floods are a common occurrence along the Mekong River and its tributaries. Variety names indicate adaptation to flooding: for rapid stem elongation there are names such as *Loy loy* or *Phou* (floating or swimming rice), and *Loy pa* or *Louk pa* (floating fish). Many of the traditional varieties grow very tall and lodging is a major constraint. Varieties that do not lodge are called by names such as *Kok lek* (iron stem), *Bong* (bamboo stem), *Aev* (flexible stem) and *Tia* or *Tam* (short plant) for example. They also indicate adaptation to poor soil conditions, such as *Bo hina* (any field). Resistance to biotic stress like birds (hidden against birds *Li nook*), and good competition with weeds (win over weeds *Phae nya*) are common.

Cultural aspects

Some names relate to cultural aspects, or even possible modes of domestication and selection. For ex-

ample, the variety *Mae may* (widow) produces some unfilled grains, while *Mae hang* (divorced woman) produces a lot of grain. This latter name relates to the bountiful crop that keeps a woman so busy harvesting that her impatient husband leaves her—many of the rice farmers in the Lao PDR being women. Fish (*Pa*) are consumed regularly (fresh or fermented) by the Lao and are an important part of the diet; many rice names are fish-related. *Pa siev* (tiny carp) indicates that the grains are slender and long. *Namman* (fat—often in conjunction with duck or cow) is a name associated with good taste. *Mak fay* (sour berry) refers to the flavour or grain shape; *Ked tao* (turtle shell) may indicate the shape of the grain.

Conclusion

The diversity of rice varieties grown by Lao farmers for generations is impressive. Through domestication and selection, farmers have adopted a broad range of varieties adapted to different production systems, and which satisfy different culinary and nutritional needs of households. This diversity is also reflected in the multiplicity of names that farmers have given to their rice varieties. The varietal name information presented in this paper was collected as part of the overall germplasm collecting effort. No attempt has been made to link this with landrace diversity *per se*, nor make any analysis across ethnic groups; these data are not available. A more detailed anthropological study of rice cultivation in the Lao PDR would generate this information and permit a more rigorous analysis of a ‘folk taxonomy’ of native rice varieties. Despite apparent shortcomings in the present study, the paper is a comprehensive report of rice variety names and their distribution throughout one country that lies in the centre of origin of the crop.

In the Lao PDR, much of the rice production is still based on the cultivation of traditional varieties. This diversity has now been safely conserved in the national genebank, and duplicated in the International Rice Genebank at IRRI. Detailed information about each germplasm sample enhances its value for rice improvement; it also helps when restoring germplasm to farmers. Given the demands for increasing rice productivity in the Lao PDR, the national germplasm resources represent a unique source of diversity for glutinous varieties that cannot be obtained from other countries. The names of these varieties can assist in

their use in the rice improvement programme of the Lao PDR.

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