

# A Race Against Time

The final stages of a worldwide race against time were played out last year in the lowland rice fields of Lao PDR.

And the final scenes of the race were no different from those repeated thousands of times across 23 countries in Asia, Africa, and Latin America.



*Rice seed collection in a farmer family's field—a scene that has occurred thousands of times over the last five years across three continents.*

"Lao PDR will be a significant contributor to additional food production for the world."

Bent beneath the sweltering November sun, a farming couple hurried to complete their harvest in the village of Vang Houa, in Vientiane Province. Suddenly, they were hailed by a group of four strangers, who approached with collection bags and notebooks. One of them was Ms. Khamsene Phimmavong (third from left above), an agronomist at the nearby Pakchaeng agricultural station.

She gestured to the freshly cut rice. "We want to collect some seed samples of the rice you're harvesting, and get some information about it."

Another in the group was Ms. Chay Bounphanousay (extreme right above), the coordinator of her country's newly established rice genebank. She explained that, by allowing the collectors to take a small sample, the farmers would be contributing to the successful future of Lao agriculture.

An animated conversation followed, during which the group took 60 healthy panicles, or about 125 grams of seed, from the family's harvest. They were told it was a glutinous rice called Nambak, after the district in Luang Prabang Province where it originated. "I'm not too happy with the crop," the farmer's wife (third from right above) commented. "I won't be growing Nambak next year."

### Collection Campaign

The campaign began in 1995. It aimed to collect every possible variety of cultivated rice and every possible wild species before farmers turned en masse to popular high-yielding varieties and their traditional ones were abandoned and lost forever. Their seeds are now stored for the good of humanity, to enrich the breeding programs of rice-growing countries around the world.

Ms. Chay Bounphanousay (left) and Dr. Appa Rao inspect the condition of seed samples in the medium-term storage area of the Lao genebank that was established during the biodiversity project.



In all, nearly 26,000 samples were collected from 23 countries—11 each in Asia and Africa, and one in Latin America. But Lao PDR was the most successful. The effort there accounted for more than half the total number of samples collected across the world.

The importance of Lao PDR was recognized early in the project. Unlike nearby Thailand and Vietnam, little had been done there to gather the country's diversity of rice, although it lay within the primary center of origin of the dominant Asian species *Oryza sativa*. Archaeological evidence suggested that the earliest domesticated rice cultivation, involving glutinous genotypes, began there about 6,000 years ago.

So, with a bountiful diversity of traditional varieties and a need to train Lao extension officers in the art of seed collecting, IRRI decided to send a staff member from its Genetic Resources

Center, Dr. Seepana Appa Rao, to live in the country.

And, according to the director of the Lao National Agricultural Research Center, the appointment was timely. Dr. Hadsadong says that the IRRI scientist arrived just in time to save the country's precious rice varieties, before large-scale adoption of modern varieties began.

As well as criss-crossing the country's 16 provinces, its special zone, and the Vientiane Prefecture with teams of collectors, Dr. Appa Rao made it his business to learn the language, and, in collaboration with his Lao colleagues, he trained 150 extension officers in collecting techniques. Their job of saving rice biodiversity is now over, so they intend to turn, with their new knowledge, to collecting and storing other national crops.

Funding for the project came from the Swiss Agency for Development and Cooperation, which also met the cost of

providing a small medium-term seed storage facility at the headquarters of the National Agricultural Research Center near Vientiane.

Its capacity has since been bolstered by the addition of freezers, giving it a long-term capability.

### Storing the Seeds

In the case of each 125-gram sample collected in the field, 80 grams was stored in aluminum foil containers in the Vientiane medium-term facility, five grams went into a seed file, and 20 grams of seed was planted at an upland evaluation site. The remaining 20 grams was sent to the International Rice Genebank at IRRI, where it was placed in long-term storage as a backup to the Vientiane collection.

Already, the collection is being used to improve commercial production in Lao PDR. In particular, about 300 samples of aromatic glutinous varieties are being evaluated for the possible development of high-quality export rice.

The Lao Minister of Agriculture and Forestry, Dr. Siene Saphangthong, who is also a member of IRRI's Board of Trustees, says that the richness of his country's rice genetic resources should be considered a national heritage developed by Lao farmers.

"Through the collection and storage of these resources, Lao PDR, even though it's a small country, will be a significant contributor to the development of new rice varieties and additional food production not only for ourselves but also for the world."

The leader of the nine-year-old and immensely successful Laos-IRRI Project, Dr. John Schiller, gives credit to Dr. Saphangthong and other agriculture policymakers in the government for understanding the need



for crop biodiversity in the first place. He says that, even during a time when food security was a big issue, they accepted the challenge of preserving their biodiversity without reservation.

But much of the credit for the Lao collection goes to Dr. Appa Rao.

## Unfinished Business

Although the collection project finished at the end of 1999, Dr. Appa Rao believes that one aspect of his work is still undone, and he and his colleagues are seeking more funding and more time in the field to finish it.

They want to go back to the Lao farmers to document their indigenous knowledge about the traditional rice varieties. For the most part, his collection teams didn't have time to record this information while they were preoccupied with the task of gathering seeds, and most experts agree that information about the collected samples is just about as important as the samples themselves.

Dr. Appa Rao even plans a book on the traditional rice varieties of Lao PDR, and a big part of that would involve interpreting the colorful folkloric names given to the different varieties.



Examples include *Kay Noy Hom* (small chicken, aromatic), *Khen Sua* (hidden shirtsleeve), *Gnod Nang* (super woman), *Gna Thao* (grandmother), *Leum Phua* (forgot husband), *Namman* (fat—often duck or cow), *Pa Siev* (tiny carp), and *Khao Poum Pa* (rice in fish stomach).

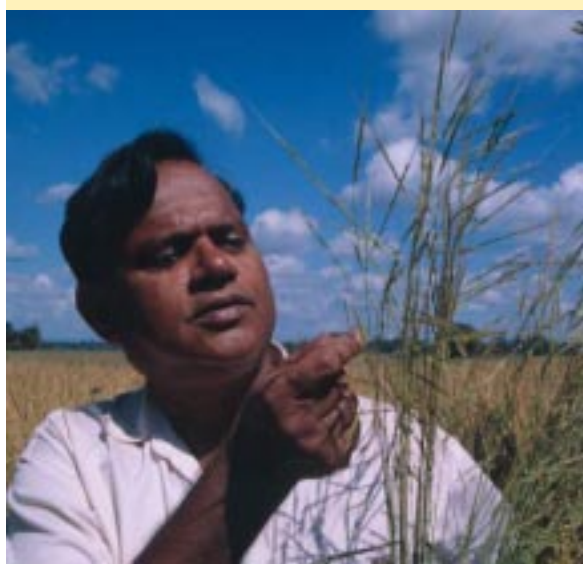
According to Dr. Appa Rao, there's a lot more to the names than meets the eye, and it all must be explained by the farmers.

For instance, *Fat* is a term associated with good taste, *Neglected Fields* means the variety can grow under poor soil

conditions, *Mae May* (widow) produces some unfilled grains, *Mehang* (divorced woman) produces so much grain that it keeps a woman too busy to remember her husband, who left her, and *Watching Dog* is a variety with such poor quality that even the dogs prefer just to look at it and leave it uneaten.

So rich is the anecdotal history of rice in Lao PDR that the book may become a labor of love. "The sun is close to setting and I will be retiring soon," Dr. Appa Rao concludes. "So, for the benefit of science and rice, I want to document this information for the coming generations." ■

*Collection of farmers' indigenous knowledge is an important part of the process.*



When Dr. Appa Rao accepted his position, he had never dealt with rice, although he was deeply experienced with other crops. He'd spent 19 years as senior germplasm scientist at the International Crops Research Institute for the Semi-Arid Tropics in his native Hyderabad, in India. Much of his earlier career had been spent combing Asia and Africa collecting traditional varieties of sorghum, pearl millet, groundnuts, and perennial pigeon peas.

"Specific knowledge of rice came quickly to me as I immersed myself in the crop," he explained. And "immersed" is the correct word. Dr. Appa Rao was also responsible for simultaneous seed collection campaigns in Cambodia, Myanmar, Thailand, Vietnam, and southern China, where training was his major emphasis. But he ended up spending about

90 percent of his time in Lao PDR, and his will to get the job done struck a chord with his Lao teammates. Together they amassed about 13,000 samples from the Lao countryside.

But the job has been tough on Dr. Appa Rao's family life.

"My wife Padmaja is a rice physiologist at the Directorate of Rice Research in Hyderabad," he says. "So, she didn't want to come here to be a housewife when her husband was on the road most of the time anyway."

Their two daughters, Sree Devi and Sree Kala, are both medical doctors, one at home in Hyderabad and the other in Omaha, Nebraska. "With the family away, I don't feel so guilty about working long hours," he says. "Nobody is waiting at home."