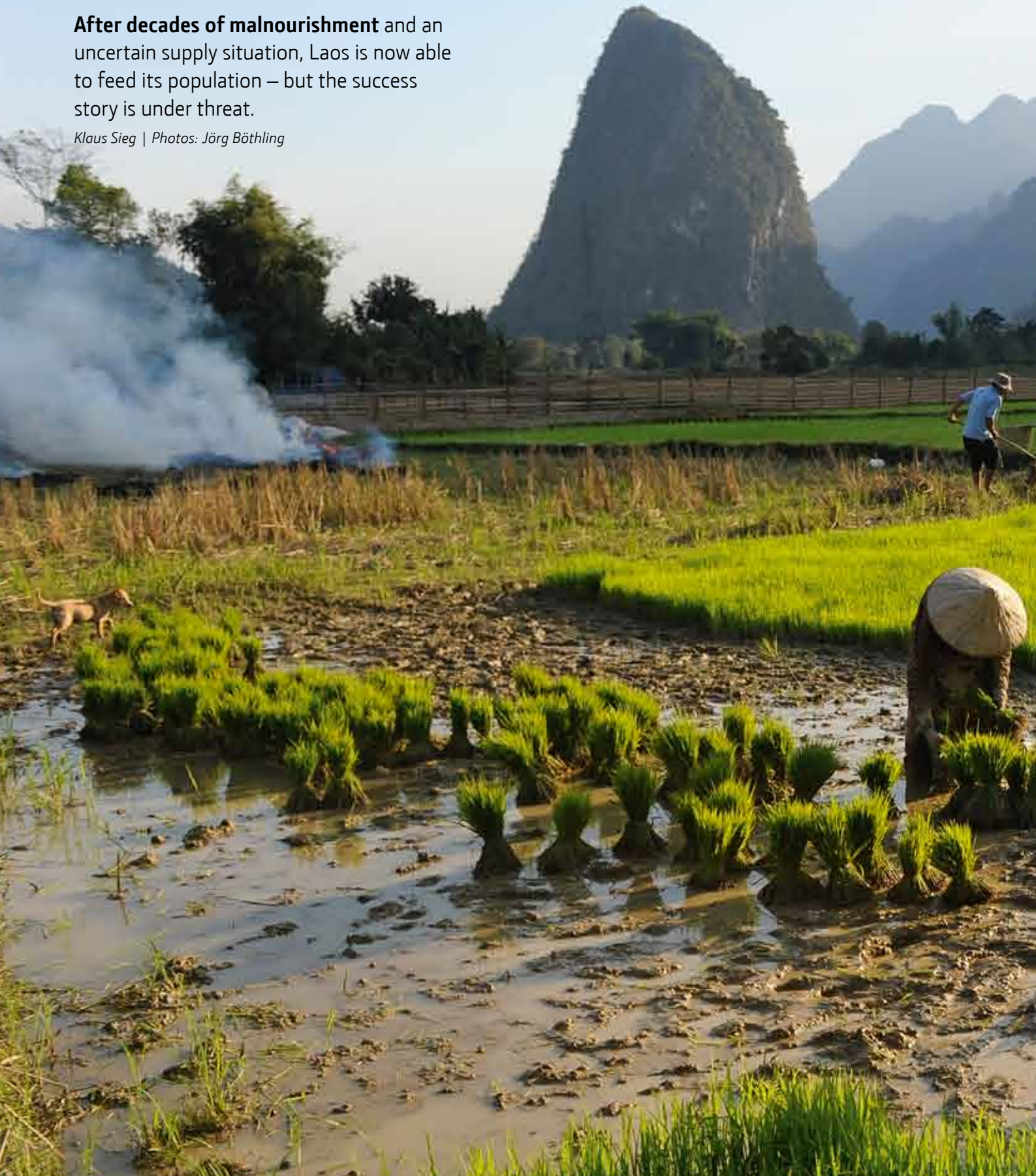


# REVOLUTION IN THE PADDY FIELD

**After decades of malnourishment** and an uncertain supply situation, Laos is now able to feed its population – but the success story is under threat.

*Klaus Sieg | Photos: Jörg Böhling*







1 A worker separates the chaff from the rice harvested on the trial plots of the Na-phork research centre. | 2 Seeds of local rice varieties are assessed and selected. | 3 Selected rice varieties are sampled in small plastic bags and archived in the cold storage room of the centre. | 4 Only small push tractors can be used on the small rice paddies to ease the heavy manual work somewhat. | 5 Some farmers managed to prosper by growing improved rice varieties. | 6 Replanting the seedlings by hand is tough work, even in such a scenic setting. | 7 Meagre yields for those farmers growing highland rice varieties in the mountains. | 8 The market in the capital Vientiane offers a large assortment of rice varieties.

**B**ounthanh Nhanphatna sits in the shade of a gnarled tamarind tree. Her hands are covered in calluses from working the fields. Nonetheless, the paddy farmer weaves a bamboo basket so quickly that the onlooker can hardly keep up with her movements. “What sort of rice do I like to grow best? No contest, definitely Hom Sangthong!” Behind her, in an enclosed basin, lie the paddy fields of Ban Hai-Tai, a small village in Laos to the north of the capital Vientiane. Bounthanh Nhanphatna tills her two hectares in the basin, where she produces a little black rice but mainly Hom Sangthong, a type of glutinous or sticky rice. “It brings in the biggest profits,” Bounthanh Nhanphatna nods. The 50-year-old knows a lot about rice; she has spent her life growing it.

The people of Laos have cultivated rice for around 4000 years and it represents the main source of nourishment for the Laotians. The citizens of the south-east Asian country usually eat it as sticky rice. The starchy rice types are steamed in a bamboo basket until they are ready to eat. Other countries use these rice types for desserts and puddings. In Laos, rice is the staple diet, served for breakfast, lunch and dinner. Each of the country’s 6.2 million inhabitants consumes on average one kilogram per day. Most of the rice stems from domestic production, with four fifths of the country’s citizens growing the crop. Laos covers an area around the size of Great Britain, 700,000 hectares of which are occupied by paddy fields.

### SIGNIFICANT INCREASE IN RICE PRODUCTION

For many years Laos was unable to feed its population. Although there were never any famines, malnourishment and food insecurity were recurring themes for many decades. Since 1995, however, the country has increased its rice production from 1.5 to 2.5

million tonnes per year. Improvements to cultivation methods combined with the introduction of new seeds and the optimisation of existing rice types have led to greater yields. Back in the sixties the average yield per hectare was less than one tonne. Today, paddy farmers average yields in excess of three tonnes, whilst some especially good regions can produce up to seven tonnes. These are modest figures in comparison with industrial rice production, however, for a mountainous country with an extremely fragmented agricultural economy such as Laos, they represent a significant increase.

This agricultural revolution was promoted by the Laotian government, the International Rice Research Institute (IRRI), various international aid organisations and the people in the villages – like paddy farmer Bounthanh Nhanphatna.

She can achieve up to 4.5 tonnes per hectare with the local rice species. “It used to be less than half that amount.” But her success did not happen overnight: Bounthanh Nhanphatna has tried out many local rice species. For the past 12 years she has produced her own type of seed by way of selection. She also produces her own fertiliser and has improved marketing methods in collaboration with other paddy farmers. “We used to call this rice type ‘Small man with a black backside’,” laughs Bounthanh Nhanphatna heartily. “But we decided this name was too negative and changed it to Hom Sangthong.” Hom Sangthong translates as ‘Scent of Sangthong’, the name of the province in which the village is located.

### INTERNATIONAL RICE RESEARCH

The rice species preferred by Phoumé Inthapanya has a less poetic name: TDK followed by a hyphen and a number from one to



twelve. The director of the Naphork National Rice Species Research Centre, the IRRI's Laotian co-operation partner, wears a T-shirt with the slogan 'The future of rice' printed on the back.

The research centre is situated on the outskirts of Vientiane, surrounded by 180 hectares of land for cultivation research. The Naphork Centre maintains the only genetic database in Laos. Around 2000 different local rice species and more than 13,000 samples, all packaged in small plastic pouches, line the wooden shelves of a simple hut. The different species were named by the locals who use them, and the institute has adopted these names. The plastic pouches bear the names in red felt tip pen: 'Little hen', 'Fat duck' and 'Forgotten husband'. "Because this type tastes so good that the woman forgets about her husband." A grin breaks out on Phoumé Inthapanya's haggard face. The 56-year-old has been dealing with rice for the past 35 years. He studied agricultural engineering in Vietnam, among other countries, and has headed the Naphork Centre since 1991.

Local species are adapted to the region's microclimate, soil properties or cultivation methods. "We used them to develop 12 TDK species and a number of sub-species," explains the rice researcher. "Our method was based primarily on mass selection and conventional cross-breeding; we have also started doing some work with genetic technology." The scientists used the same methods to improve 14 existing local species.

Seeds from Thailand or the Philippines are sometimes used for cross-breeding to optimise or create new local species. In return, the IRRI uses Laotian species to improve cultivation in Bangladesh or India. Stalk length, grain size, storm resistance, water requirements, ripening time, taste, nutritional value, consistency – the demands on all of these criteria can differ significantly from

one region to the next. "We develop species in close co-operation with the paddy farmers – after all, they are the ones who will cultivate the rice," explains the director. "That is why the acceptance rate for our species is so good."

The research centre maintains branches throughout the country to distribute new and improved species and provide instruction in their cultivation, thus ensuring their widespread use. Paddy farmers receive new species free of charge, while seed companies have to pay for them. They do not need a licence, however, to propagate and sell the rice species.

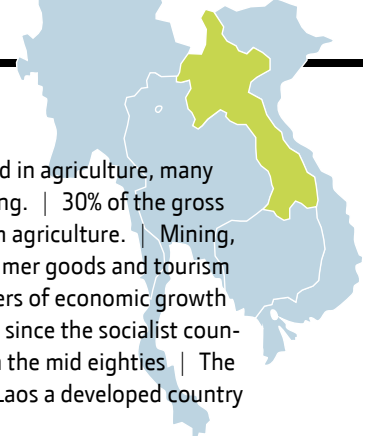
Next year, the research centre hopes to bring out a TDK variant that is capable of surviving longer in flooded paddy fields. Unusually heavy and long-lasting floods are becoming more commonplace in Laos as a consequence of climate change.

The only question that remains is what TDK actually stands for – and suddenly things are poetic once again: TDK stands for Tadokam, which translates as 'Harbour of golden flowers'.



### LAOS IN FIGURES

75% of Laotians are employed in agriculture, many of them in subsistence farming. | 30% of the gross domestic product stems from agriculture. | Mining, (hydroelectric) energy, consumer goods and tourism have become important drivers of economic growth with rates between 6 and 8% since the socialist country opened up its economy in the mid eighties. | The government hopes to make Laos a developed country by 2020.





## RICE IN LAOS:

- Rice cultivation on 700,000 hectares of land; 67% is located in the fertile lowlands and irrigated by rain alone; 12% is irrigated artificially; 21% is cultivated in the mountains, usually using the slash-and-burn method
- The irrigated surface area is rising: 87,000 hectares in 2006 had expanded to 100,000 hectares by 2011. The full potential lies at 150,000 hectares.
- The average smallholding size in the lowlands is between 1.5 and 2 hectares, while in the mountains it is between 0.5 and 1 hectare
- Over the past 15 years, Laos has increased its rice production from 1.5 million to 2.5 million tonnes

## NEW CHALLENGES

Meanwhile, Laos is producing small surpluses, some of which are exported. "Our rice is of the best quality and is often grown without the aid of chemical fertilisers and agricultural pesticides," says Khamphenphet Chengsavang, operator of one of the country's largest rice mills. The entrepreneur recently invested one million US dollars in a separating machine. His main customers have been the police force and the military in Laos, then two years ago he also began exporting rice to Thailand, China and Vietnam.

However, all that glitters is not gold. Yes, Laos has succeeded in feeding its population with home-grown rice, and the global price increase for basic foodstuffs has not had any real impact on the country. But will it continue to be able to feed its growing populace in the future?

Laotian paddy farmers still tend their small fields largely by hand. In a few regions they use hand tractors to assist with ploughing but that is only possible if the fields are not located on steep inclines. Rice cultivation in mountainous regions, however, still accounts for one fifth of the entire cultivation area. The fields there are not even the size of half a football pitch. Every year the paddy farmers move on with their crops. They cut down trees and bushes with axes and machetes for burning and use the ash to fertilise the fields. Then, during the rainfall period, they walk across the fields making small holes in the soil with a stick. A rice grain is planted in each hole. After a harvest, the farmers will leave a field to rejuvenate for a couple of years, allowing the natural vegetation to grow. Then they return to burn it down and cultivate their crops once again.

Slash-and-burn agriculture and nomadic cultivation were once the only method of growing crops in the region. Tractors and water buffaloes cannot navigate the steep inclines and there is not enough suitable land, labour or resources for terraces and irrigation systems. But this tillage produces little yield – each hectare produces barely a tonne. And slash-and-burn cultivation is eating its way into the mountain forests, which are becoming increasingly bare – with catastrophic consequences for the micro-climate and water reserves.

## CONTRACT AGRICULTURE FOR EXPORTATION

The problem is compounded by a growing number of plantations, usually with rubber or teak trees. Investors from neighbouring countries China and Vietnam conclude contracts with farmers or lease land from local governments and appoint employees to cul-

tivate it. Many farmers, however, do not appreciate the risk of contract agriculture.

Investors are also increasingly knocking on the doors of small-holdings in the fertile lowlands. "I have had companies visit me from South Korea, Vietnam, China and Kuwait; they all wanted to cultivate food crops for exportation," says Kham Phey. The 46-year-old grows rice on two hectares of land in the province of Vientiane. He wears a grey Lacoste T-shirt as he relaxes in front of his house. The farmer, who studied agricultural technology in Slovakia, had intended to work his fields today but a power failure has rendered the irrigation pump useless. Kham Phey cultivates TDK rice species for the local market. He can harvest his fields twice a year thanks to artificial irrigation. Even three would be possible but the majority of Laotian farmers do not want that many. They fear local market prices would fall and that too many harvests would place too great a strain on their fields.

The family prefers a species named 'Aromatic swallow' for its own use. "It does not yield as much as others but tastes much better," Kham Phey smiles. His family is doing well. His brick house has a satellite dish on the roof and a new motor scooter parked outside. Mango trees grow on a half-hectare plot behind the house and the fruits sell well at market. Nonetheless, he can still imagine leasing his land. "Why not, if the conditions are right?" Kham Phey would consider leasing his land because both his children are studying in the capital city and neither of them wants to take over his farm.

## UNCERTAIN FUTURE

Bounthanh Nhanphatna faces a similar dilemma. Thanks to her growing income, the farmer from the province of Sangthong can enable some of her children to study in Vientiane. Those remaining in the village have started their own small tailoring and beauty salon businesses. Sometimes they help out on the fields, however, in the long term, the successful paddy farmer wants to employ paid workers to cultivate her fields. The prospects are good: the Nam Ton river flows close to the village and could provide irrigation via an artificial canal. Furthermore, the villagers cultivate Fairtrade rice for sale on the European market. However, these opportunities will remain unused if the next generation migrates to the city. Without paddy farmers Laos will be unable to continue its successful rice cultivation. So who knows how long Bounthanh Nhanphatna will continue to sit beneath the tamarind tree and weave rice baskets? ■

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