Crop diversification and nutrition

As nations prosper, diets invariably change and diversify in ways that chart pathways out of poverty and malnutrition for subsistence rice farmers.

**BY WARREN PAGE**

Rice provides 71% of the average daily calorie intake for most people in Burma. The per-capita rice consumption—190 kilograms a year—is the highest in the world. Much of this rice is grown in Burma’s Ayeyarwady Delta and Bago regions during the monsoon season, with more than 3.2 million hectares planted. In the non-monsoon months, a second rice crop is planted, or alternatively a pulse crop such as black or green gram.

With economic prosperity and the shift from agrarian to urbanised societies, diets become more diversified. This is occurring in countries such as China and Indonesia.

As Peter Timmer, a leading development economist, points out, “no country has been able to sustain a rapid transition out of poverty without raising productivity in its agricultural sector.”

A key factor in this transition is the shift of the greater part of a country’s population from agriculture to other work, according to economist David Dawe from the International Rice Research Institute.

In Burma, 73% of the population lives in rural areas, with one-third of the population living in poverty. In 2010, 35% of Burmese children younger than five years had stunted growth.

However, the examples of rural-to-urban migration in China and Indonesia suggest Burma is on the cusp of a large-scale transformation in the demographics of the country. Already, millions of Burmese work in neighbouring countries’ cities, and Burma’s own cities are growing. This situation is likely to accelerate with the recent political and economic reforms.

In both China and Indonesia, economic reforms supported the transition from rice production to more diversified farming. The increased diversity of farm production has helped millions of people in both these countries move from poverty and subsistence rice farming to a better life.

Growing rice at a subsistence level is known to be a poverty trap. Farming is restricted to the growing of rice to feed families and provide seed for following crops, without generating sufficient income to break this cycle.

This trap also has serious implications for nutrition intake. A 195-gram serve of long-grain, cooked brown rice provides 11% of the recommended daily calorie value (based on an adult diet of 2,000 calories a day). The same serving provides no vitamin A, C or D intake, only 5% of recommended daily iron value, 2% of daily calcium and no vitamin B12 value. Yet for most people in Burma, rice is the main staple, providing almost three-quarters of their daily calorie intake. So how can this situation change?

A common approach to breaking the poverty trap and improving dietary intake is diversifying farm production. The success of diversification mainly depends on inclusion of higher value, non-rice crops within rice-based farming systems. Applied correctly, this approach increases the overall productivity and provides additional income for farmers and their families.

On a larger scale, diversification of production can accelerate economic growth, creating markets and the beginning of the transition out of poverty and towards prosperity.

The experience of ACIAR projects elsewhere, such as Cambodia, has seen farmers improve rice yields and expand into other crops, increase their livestock numbers and begin to focus on supplying markets.

However, the complexities around farm

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A smallholder farmer with her basket of freshly harvested groundnut in Burma’s central dry zone.
size, varying soil types and climate, agricultural inputs, seed varieties and traditional customs mean that no one solution fits each country or farm. Selection of the crops and management strategies best suited to local conditions needs research and careful planning.

In Cambodia, tailoring research to the specifics of local climatic conditions, agronomic skills and nearby markets has helped farmers diversify production into maize and other valuable crops.

In Burma, ACIAR projects are similarly focusing on providing locally appropriate ways to enhance crop yields and introduce crop diversity. The aim is to not only enhance productivity and provide income opportunities, but also improve diets through access to increased nutrition.

Legumes are the second-most-important group of crops in Burma, after rice. They are a major source of protein, minerals and vitamins, so improving legume productivity is potentially one of the most successful strategies to improve nutritional security.

ACIAR research into enhancing legume production in Burma’s central dry zone has been running since 2007. It has provided farmers with higher yielding crops and improved rhizobial inoculants for natural fertiliser, and established the country’s first village-based seedbanks. The improved varieties of chickpea, groundnut and pigeon pea yield as much as 35% more than traditional varieties and are being readily adopted by farmers. The work is now being built on to capitalise on its achievements and will also inform other projects in Burma.

In the Ayeyarwaddy Delta, opportunities for smallholder farmers to increase diversification in rice–rice and rice–pulse cropping are being examined. This research is determining best practice for crop selection and management to both increase and sustain crop yields. The adoption of new rice varieties and alternative management options by farmers in the delta will allow them to advance their rice harvest and also have better options for post-rice crops such as black gram.

For many poor farmers in Burma, crop diversification will play an important role in escaping poverty and lifting their daily nutrition intake towards recommended levels. Younger family members may especially benefit from opportunities to access improved nutrition.