How was your rice grown?

Over the last 50 years the Green Revolution and Asia's economic growth have changed rice-growing in the region to the point where classic picture postcard images are increasingly hard to find in reality.

On a recent trip to the World Heritage-listed rice terraces in the Philippines, our family observed age-old techniques which catch rainfall, divert small fractions of mountain streams and use organic inputs to yield much the same quantities of rice as centuries ago. This is rice production for the purists, but alas this system is in decline, as it needs a lot of cheap labour to maintain it. And that cheap labour is becoming a thing of the past right across Asia.

For millennia, traditional Asian rice systems converted soil, water and natural sources of nitrogen into the rice the populace needed to survive. That all changed in the 1960s, when higher-yielding varieties were released by the International Rice Research Institute, more irrigation water, fertilizers and pesticides applied to increase productivity. This was the Green Revolution, that helped to diminish rice shortages arising from a growing population, limited land and traditional nutrient sources. Asia did mostly succeed in feeding itself. Yields doubled and tripled, aided by modern varieties and this new flow of external inputs, expansion into less favourable environments and an army of farmers being paid next to nothing. Importantly, continued use of puddling (ploughing the soil when it is underwater) and transplanting (first growing the young seedlings in a nursery to protect them from flood, drought and pestilence) kept weed populations low. Few herbicides were required.

Asia's economic growth, and the alternative employment opportunities it presents, has been reducing and ageing the army of traditional rice farmers. Tractors and mechanical harvesting have progressively replaced buffaloes and manual labour. In particular, especially with diminishing water supplies, the art of puddling and transplanting is being forsaken in many rice-growing regions of Asia in favour of sowing the seed directly into the field. About half of the crop in the major rice-growing regions is now direct-seeded, and this proportion is increasing. But where this has happened, both weed density and the reliance on herbicides have increased sharply. In particular, weedy rices—local wild species of rice that grow vigorously to out-compete rice, but yield little themselves—are defying conventional weed control techniques and compromising yields. Herbicide-resistant varieties are now increasingly being used to address this and these are progressively failing as the weedy rice itself becomes resistant. Similarly, addition of artificial nitrogen for crop uptake and its leaching deeper into the soil has acidified soils. As Asian rice systems industrialize to function with less labour, they confront the same problems as other industrialized farming systems.

Asia's economic growth has provided lucrative markets for our minerals which have driven our sustained economic growth for two decades, despite stagnant labour

productivity elsewhere in the national economy. The transformation of Asia into the world's manufacturer has also brought us cheap consumer goods, blessing us with a one-off bonus of low inflation with this strong growth for the past 2 decades. But those same changes in Asia that have enhanced our lives are also bringing us rice that is far from organic and takes more of the world's non-renewable resources to grow. The postcard scenes of tribes of field-workers under straw hats are gone. In economics, for every action there is generally a reaction. To put it another way there is no such thing as a free lunch Those who wish to believe their typical imported Asian rice—or other staples, for that matter—is somehow more environmentally-friendly or sustainable, are deluding themselves.