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LAND FOR LIFE PROGRAMME

Inga Foundation is pioneering a revolutionary solution to one of the most pressing and neglected global environmental problems; the destruction of the world's remaining primary and secondary rainforests by slash-and-burn subsistence agriculture. In seeking to turn the tide of forest destruction, and to address the food-insecurity that is its primary cause, they are implementing, with farming families, the findings of the Cambridge University Inga projects which began in Costa Rica in the 1980s and ended with trials on farmers' plots in Honduras in 2002.

Slash-and-burn subsistence agriculture has fed millions of families over past centuries; today it keeps an estimated 250-300 million people in poverty; and its widespread failure is an underlying cause of rural-urban migration in the tropics. The consumptive process by which forest cover is converted to invasive grassland, over vast swathes of former tropical forest, is estimated to be firing the major proportion of around two billion tonnes of carbon from land-use change annually into the atmosphere. Neither this process, nor the families' attempts to feed themselves, is sustainable today.

Following pilot studies (1986-88), a slash-and-burn operation was carried out in secondary forest in the humid tropical lowlands of Costa Rica in 1989. The resulting two hectare swidden site provided the living laboratory for long-term studies and trials examining the following key questions:

- What are the ecological impacts of a slash-burn operation upon soil properties and processes?
- What minimal-input agricultural systems, if any, are indicated as possessing any promise of sustainability?

Research projects in Costa Rica and later Honduras, answered these questions; a seven year trial yielded one system which emerged as sustainable along with a body of explanation as to why this was the case. The team now understand why the soils of slash-and-burn sites degrade. Massive loss of the soil's available phosphorus proved to be the key insight. These findings alone were sufficient to explain what is driving shifting agriculture in the acid soils of the world's humid tropics.

The sustainable system to emerge from the long-term trials was Inga alley-cropping. This system works because it not only retains and recycles the phosphorus that it inherits from the original burned forest ecosystem, but it also retrieves, retains and recycles the small supplementary quantities of rock-phosphate that is all that the subsistence farmer can afford to apply. The system also controls weeds and provides domestic firewood.

In all the current work, the families were trying to restore land already degraded by repeated slash-and-burn. The process starts by raising 5,000 Inga tree seedlings in a nursery. The trees are planted in parallel lines four metres apart along the contours of a hectare of land. Within two years, and supplemented by small quantities of rock-phosphate, they will have shaded out the invasive grasses and be ready for pruning and crop planting. The major input of the Inga is in this mass of tough green foliage applied to the soil surface as mulch. Mulch provides nutrients and energy for the soil microbes and physical protection from sun and rain. Countless examples of hitherto 'sterile' plots are now yielding their first grain crops in years. Many cash-crop cultivars have been successfully trialled in the Inga alleys. Together with basic grains, these comprise the core of a sustainable rural livelihood that also sees the reforestation of formerly degraded land now liberated from the slash and burn cycle.

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The Inga Foundation is currently working in two critical areas bordering an endangered remnant of the Central American rainforest, the Pico Bonito National Park. A project farm has been purchased, with demonstration alley plots and three hectares of Inga orchards to satisfy a huge and growing demand for Inga seeds. Starting in early 2012 and aimed at recruiting 40 families per year, over 120 families had adopted the system by March 2014 and many more are interested.

The 10-year Land for Life programme is evolving into education and demonstration. By its mid-point, the project's emphasis will have shifted from extension of the model to a regional role as a model for sustainable agriculture throughout Central and South America and adjacent Caribbean. Projects have begun in Guatemala, Nicaragua, Belize, Bolivia and Peru. This is where The St. Andrew Prize for the Environment's funding becomes crucial, as it will allow the Inga Foundation to build the essential demonstration and education centre on their farm.

With their partners the Royal Botanic Gardens Kew, the Inga Foundation have begun pilot projects in other countries seeking local legume tree species that can function as Inga does in Central America. There are projects in Congo and Madagascar, and much interest in south-east Asia to establish trials. A local answer has the potential to be a key solution to one of the world's most persistent environmental problems.

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