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# Roots of Resilience:

## Traditional Hilly Paddy Cultivation in Kg. Bambangan Lama, Ulu Tuaran, Sabah, Malaysia



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**K**g. Bambangan Lama, Ulu Tuaran, Sabah, Malaysia is an isolated community characterized by rugged terrain and infertile soil. It is situated within the Crocker Ranger Buffer Zone. The area is positioned at an altitude of roughly 1,130 feet above sea level. The local population continues to practice traditional hillside farming, with a particular emphasis on cultivating stingless honeybees and a diverse array of cash crops. The local community engages in traditional hillside farming, prioritizing self-sufficiency and concentrating on the cultivation of both food and income crops. This article aims to emphasize the complex art of traditional hilly paddy planting, which could bring about significant change by promoting sustainable agricultural practices, enhancing community resilience, and empowering humanity to preserve cultural heritage while protecting the environment for future generations.

The traditional method of planting paddy on mountainous terrain, commonly observed in distant rural places such as Kg. Bambangan Lama, Ulu Tuaran, entails a painstaking process that relies heavily on local knowledge and expertise (Figure 1a). In mountainous regions, this frequently entails recognizing tiered fields or constructing terraces to accommodate the rice paddies. The paddy hill must possess access to water sources, such as rivers or streams, to provide irrigation. Kg. Bambangan Lama, Ulu Tuaran benefits from a sufficient water supply due to its access to water gravity resources and its proximity to the secondary forest, making it a good location for traditional hilly paddy cultivation.



The author had the privilege to see the planting procedure at Kg. Bambangan Lama, Ulu Tuaran. Prior to planting, it is necessary to prepare the land. This process entails removing all plant and debris from the terraces and ensuring that the soil is appropriately levelled and graded. The local farmers typically engage in land clearance and slashing, allowing the plant leftovers to undergo a drying process for around one month. Shifting agriculture, sometimes referred to as slash and burn, is the method employed here (Figure 1e). This process entails the deliberate removal and combustion of plant life to establish nutrient-rich ash beds for cultivating crops. It is necessary to wait a minimum of 2 months before planting the paddy immediately after the process of slash and burning. During the intervals between planting cycles of hilly paddy, farmers frequently engage in intercropping or grow cash and main crops to diversify their agricultural activities and optimize land production (Figure 1b). During the intervals when hilly paddy is not being planted, farmers have practiced intercropping by growing different crops between the rice terraces or in nearby fields. Intercropping is the practice of cultivating many crops together in a single area, which can effectively utilize space, improve soil fertility, and minimize the impact of pests and diseases. Various crops such as tomatoes, chillies, egg plants, a locally grown vegetable which is called losun, onions, pumpkins, sweet potatoes or yams, and leafy vegetables such as squash or cucumbers are commonly intercropped in traditional hilly paddy production locations. During the fallow interval between hilly paddy planting cycles, certain farmers choose to cultivate cash crops. Cash crops are agricultural products cultivated primarily for commercial purposes rather than for personal or local use. The crops cultivated in the area may consist of fruits such as bananas or pineapples, spices like ginger or turmeric, or cash crops like dragon fruits. The specific selection of crops is determined by the prevailing local climate, soil conditions, and market demand. In addition to cultivating paddy in steep terrain, farmers have allocated portions of their land to cultivate other significant major crops that enhance their agricultural methods such as rubbers (Figure 1c).

In the conventional cultivation of rice in hilly areas, the harvesting procedure usually necessitates the use of physical labour because the difficult terrain makes it impractical to employ machines. Agriculturists employ sickles or scythes to harvest mature paddy plants by cutting them near the ground. The tool is alternatively referred to as "Linggaman" in the local context (Figure 1d). Next, they collect the gathered crop and bundle it together, securing it for the purpose of drying. Ultimately, the

desiccated bundles undergo threshing to separate the grains from the stalks, and then winnowing is performed to eliminate the chaff. Following the harvest of crops such as rice paddy, farmers may choose to leave the land fallow for a certain duration to replenish soil fertility and rejuvenate natural resources. The duration of fallow periods can vary, ranging from a few months to several years, depending on the agricultural practices and environmental circumstances specific to the area. During the fallow time, the land can either be left unplanted or planted with cover crops to mitigate soil erosion and improve soil fertility. Although slash and burn agriculture may yield short-term benefits, it can also result in unsustainable practices that contribute to deforestation, soil degradation, and the loss of biodiversity. Recently, there have been endeavours to advance sustainable land management practices and alternative farming approaches that reduce environmental harm while yet fulfilling the requirements of local populations. Implementing sustainable land management strategies such as agroforestry, which involves the integration of trees with crops, might be advantageous in preventing slash-and-burn procedures commonly used in traditional hillside planting. Agroforestry contributes to the preservation of soil fertility, the prevention of erosion, and the generation of supplementary revenue through the utilization of tree products. Moreover, advocating for education and offering alternate means of earning a living to local people might diminish their dependence on slash-and-burn agriculture. By implementing land-use planning and conservation strategies, as well as laws that promote sustainable farming practices, we may effectively discourage the use of slash-and-burn tactics. This approach not only protects the well-being of local populations and the environment, but also plays a vital role in achieving long-term sustainability. An enhancement could entail the implementation of more effective harvesting equipment tailored for undulating landscapes, such as agile and lightweight automated harvesters specifically engineered for inclines. In addition, the introduction of community-based cooperatives or shared machinery programs could enhance the accessibility and affordability of modern equipment for local farmers, thereby boosting production and lowering the need for human labour. In addition, the promotion of sustainable farming techniques like as terracing and customized water management systems for steep terrains can effectively reduce soil erosion and enhance crop productivity. The author eagerly anticipates future engagement with the local community, aiming to empower them through information exchange, hands-on training, and engaging the industry in the collaborative efforts

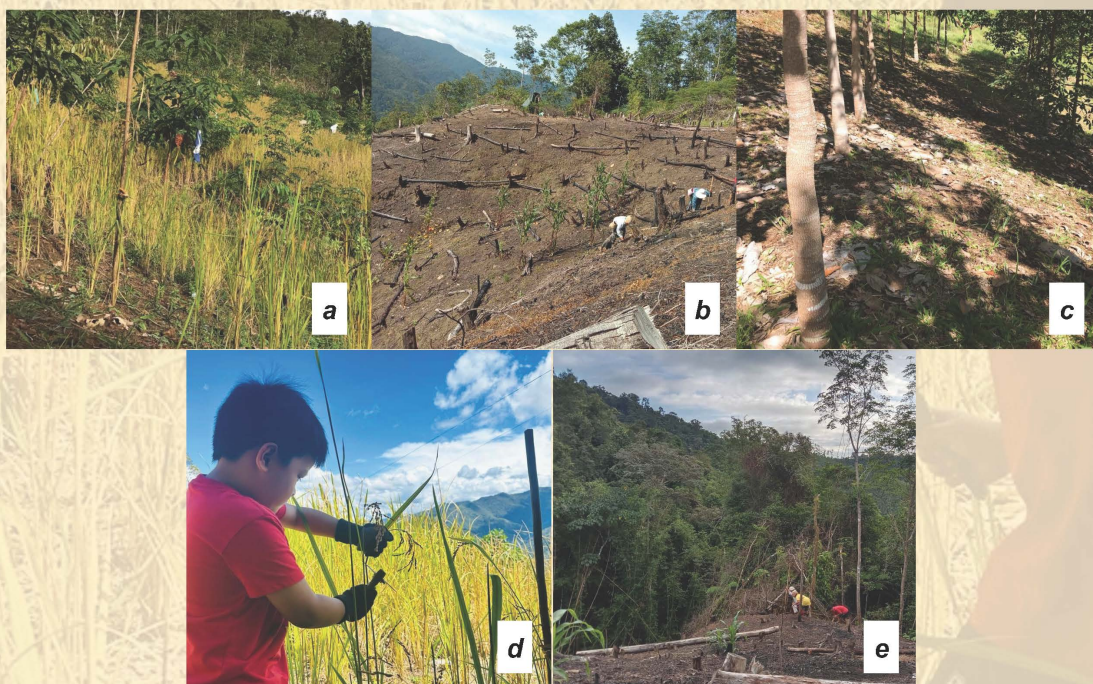


Figure 1. (a) Hill paddy, (b) Crops cultivation, (c) Rubbers, (d) Harvesting the paddy using a local tool (Linggaman), (e) Shifting cultivation (slash and burn)



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