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## The where, who and what of sustainable cacao for livelihood, life and land

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### Editorial

Weaving cacao agri-zones and climate change, together with the politics of farmer adaption and family health, this research brings an interdisciplinary approach to up skill farmers in a way that is truly sustainable for their land, wealth and health directly citing latest research from case studies in Bougainville, and Sulawesi. The biggest contribution to carbon footprint of a chocolate bar comes from the farming, which echoes IPCC reports tracing agriculture as responsible for up to 29% of green-house gas emissions. The need to collaborate between science and farming for a new way forward in conservation agriculture is called for and there is opportunity for agri-zone specific site-level climate adaption planning and training with farming. Who - Addressing a farmer's pain-points and their ability to make a sustainable living income is vital and although farmers have been very adaptive to earth's evolutions in the past, there is evidence to suggest that there is an unprecedented rate of change, as well as reducing cacao yields.

In addition to non-agricultural factors such as logging and mining and other crops, cocoa has been an important agent of deforestation for centuries and especially during the twentieth century. For hundreds of years, farmers have been using the world forest as a production factor and the system proved to be fairly defensible. Except in some countries like Brazil where cocoa plantations were concentrated in few hands, cocoa distributed wealth and sent millions of children to school. In some countries like Ghana and Côte d'Ivoire, cocoa migrations were a basic tool for building

a multiethnic society. Forest consumption also helped to make chocolate relatively cheap and affordable for consumers. However, it generated externalities in terms of loss of biodiversity and damage to the environment. More important, it often backfired on producers themselves, who have been exposed to boom-to-bust cycles and recessions as a result of too-rapid migration and deforestation.

It is thought that in the short run higher cocoa prices and improved management including pest and disease control and to a certain extent fertilizer use offer scope for a larger cocoa output. In the more distant future the predicted climatic change and increased land use for food production will reduce the size of the cocoa area and affect the leading position of West Africa on the world cocoa market. This review shows that at present the conditions for sustainable production are not met and concludes that important structural changes in the cocoa sector are needed to reach this goal. These changes concern the economic viability of cocoa on small farms, extensive land use and the ecological impact of the current cocoa growing practice. The implementation of these changes requires area specific programs with as their common goal increased economic and environmentally sustainable cocoa production on less land.