

SUSTAINABILITY IN AGRICULTURE: EMERGENT CHALLENGES AND RECENT PROGRESS

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ABSTRACT

Great progress has been made in global agricultural production during the past half century, but these have not ensured food security. The ability of global agriculture to sustain current productivity levels has been called into question by the acceleration of climate change and the degradation of overstretched ecosystems services upon which agriculture depends. The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), emphasises the interconnectedness of agriculture's various roles and functions, and its consequent multifunctionality. The report notes the fundamental failure of development policies being the reliance on the draw-down of natural capital. Agriculture is at a crossroads and in need of fundamental redirection away from food production towards multifunctional agriculture. This paradigm shift places farmers' livelihoods in a central position. One innovative approach envisions the creation of Evergreen Agriculture, denoting the comprehensive integration of perennial vegetation into annual cereal crop farming systems, creating a green cover on the land throughout the year. One such proto-type involves the use of *Faidherbia albida*, a tree indigenous throughout the African continent. This leguminous tree fixes atmospheric nitrogen, producing nutrient-rich foliage and pods that are highly valued as organic fertilizer and livestock fodder. What makes it *Faidherbia* unique is that it sheds its leaves during the early rainy season, re-growing them only in the dry season. This makes the plant highly compatible as an intercrop with fairly dense populations of food crops. Annual crops in the vicinity of *Faidherbia* trees tend to exhibit much improved performance and yield. *Faidherbia* has been long been integrated in small-scale agriculture in some parts of Africa, with reports of *Faidherbia* agroforests being expanded to cover millions of hectares in Niger and other parts of West Africa through farmer-managed natural regeneration. This provides a basis for conceiving how food crops in the future can be produced on a broad scale under the canopies of *Faidherbia* and/or other mixed agroforests.