



Policy pointers

Government, development agencies and others promoting sustainable intensification must recognise that farm households have diverse resources, capacities and priorities (even within the same community) and avoid 'one-size-fits-all' interventions.

Policies and programmes seeking to increase sustainable and climate-smart agriculture can avoid undermining farmers' successful existing strategies by recognising that smallholders' agricultural and wider livelihood systems are interconnected.

It is vital that any technological changes promoted to farmers which require extra labour or financial resources must be tested *by the farmers themselves* for compatibility with local strategies and priorities.

To avoid locking farmers into unsustainable practices, donors and other development partners should prioritise investment in technologies and farming strategies that address long-term environmental and social challenges over short-term economic returns.

Trade-offs in sustainable agricultural intensification: the farmers' perspective

Smallholder farmers in sub-Saharan Africa face a constant challenge: to choose between many, often competing, social, economic and environmental objectives while also meeting expectations to intensify their farming practices sustainably. Farmers manage this situation by making trade-offs; choosing and prioritising goals based on household circumstances and by weighing immediate productivity/financial gains against long-term goals. But at present, several factors combine to deter farmers from prioritising long-term sustainability objectives, including limited resources, agricultural policies promoting short-term productivity that depends on environmentally damaging inputs, and adoption-focused interventions that ignore household diversity. These barriers loom largest for those with limited access to productive resources, including women and young people. This paper summarises a study about how farmers in Ghana, Burkina Faso and Malawi manage trade-offs and suggests what governments, donors and development agencies can do to support more sustainable choices.

Limited resources and other constraints force smallholder farmers in sub-Saharan Africa to make 'trade-offs'. These are hard choices between multiple individual, household, community and wider social objectives – all desirable, but not simultaneously achievable. In practice, to meet the needs of their evolving situations, farmers constantly adapt their farming and livelihood strategies. This results in households and their communities treading a fine line between long- and short-term goals; social, environmental or economic objectives; and the interests of different individuals and groups.¹

Simultaneously, farmers are increasingly encouraged by governments and development agencies to follow the path of 'sustainable agricultural intensification' (SAI), promoted as a

means to meet the second Sustainable Development Goal ('zero hunger') while reducing agriculture's environmental footprint. However, as pressures on sub-Saharan Africa's natural resources grow, SAI's three sustainability dimensions (social/human; environmental; production/economic) often compete. Farmers must reconcile multiple needs and interests at different temporal and spatial scales, including field, household and community levels.²

This briefing summarises how smallholders in Eastern Burkina Faso, Northwest Ghana and Central Malawi manage trade-offs and what governments, donors and development agencies can do to enable more sustainable choices. Findings and recommendations are based on a participatory study conducted

between June 2016 and December 2019 as part of the SITAM project ('Sustainable intensification: trade-offs for agricultural management').³ More details can be found in our country reports.^{4,5,6}

To meet the needs of their evolving situations, farmers constantly adapt their farming and livelihood strategies

Sustainable agriculture: one of many priorities

The concept of SAI has been almost universally adopted as a desirable pathway toward more productive, resilient and

sustainable agricultural systems,⁷ as has 'climate-smart agriculture'. But smallholders are not only farmers — they are also community members, parents and children, artisans and traders, labourers and miners. No two households will have the same exact circumstances (see Box 1 and Figure 1).

Smallholders consider whether, and how, they can prioritise agricultural intensification in their current context. They consider a range of competing objectives, which may not directly relate to farming activities:

- **Food security.** The ability to produce or procure enough food throughout the year. In our West African study sites, many households produce most of their own food; in Malawi, farmers use a combination of cash crop sales and food crop production to feed their households.
- **Education.** Especially primary and secondary education for all children, and in some cases further education/training. Education is associated with higher earning capacity but is desirable in its own right.
- **Income.** This supports food security and education as well as paying for household needs such as medical costs, housing, agricultural inputs and personal necessities.

Box 1. The impact of diversity

Development programmes and government interventions often overlook the fact that, even within the same community, households can vary significantly in terms of resources, personal preferences and attitudes, and other aspects. Yet all these characteristics affect the trade-offs a farmer can make, and what will influence the household decision maker.

For example, a household with few adults but many young children is constrained by limited labour, yet has high food demand. As households mature, children grow up and start working on the farm, and farming and livelihood strategies can become more diversified, reducing risk and potentially enabling investment in strategies that provide longer-term benefits, such as soil and water conservation. The amount and type of land a household can access also varies, with larger farms able to enact greater diversification.

- **Social harmony.** For example, meeting social/community obligations, having high social standing and avoiding conflict.
- **Sustainable natural resources.** Including healthy soils, vegetative and tree cover, biodiversity and clean water resources.

SAI-related trade-offs and synergies can be categorised according to the nature of the competing objectives.⁸ They can occur:

- **Within** or **between** different dimensions of sustainability (economic, environmental, human/social);
- Between different **timescales** (moving from short- to long-term)
- Between different **spatial scales** (moving from micro to macro, for example farm to landscape scale)
- Between different **types of people.**

Table 1 provides examples of each.

What influences farmers' choices?

When deciding which objectives or strategies to pursue, farmers consider multiple factors:

- **Available resources.** Ownership of, access to and control over means of production at individual and household level are foremost in farmers' decision making. Lack of labour and capital prevent the adoption of desired strategies, such as soil and water conservation, external inputs or expanding the area under cultivation. Access to resources is closely linked to the enabling or disabling environment, including land tenure, subsidies and wider policy approaches to agricultural intensification.
- **Undesirable impacts.** Some strategies have negative impacts, either immediately or in time. Generally, farmers are aware of these, through their own observations and experiences and thanks to awareness raising and training activities by development agencies. How far undesirable impacts influence farmers depends on their scale, visibility, timeframe and the extent to which those causing the impact may be affected — as well as individual farmers' attitudes and knowledge.
- **Public opinion and reputation.** Farmers are influenced by their peers, traditional leaders, NGOs and government agencies, even where there is no direct influence on productive assets. Sometimes, farmers will adopt particular practices or strategies because they are (or wish to be seen as) innovators, despite not being convinced of the benefits.

Overall, we found farmers' most common

trade-off management strategy is compromise: to 'do a bit of everything'. This might mean using herbicide but also undertaking manual weeding, growing some cash crops and some food crops, and so on. However, compromise may be a way of coping with insufficient resources rather than a deliberate choice; for example, a farmer may have insufficient cash to buy enough herbicide, so must also weed manually. The extent to which choices are deliberate depends largely on the individual's awareness of all management options.

Enabling and disabling factors

The wider technological, political, policy and cultural context influences whether farmers can access the resources to pursue their chosen objectives, including sustainable intensification. Enabling or disabling factors relevant to adopting sustainable farming practices include:

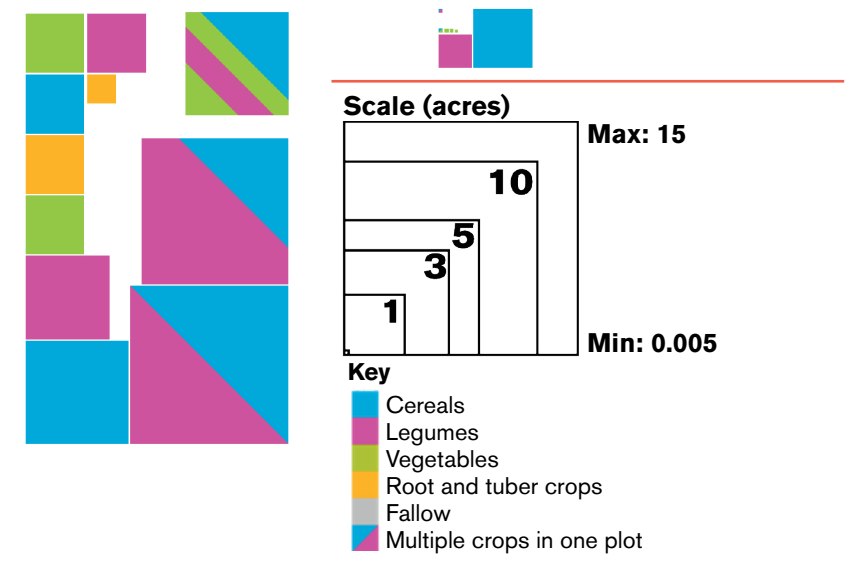
- **Technologies** such as agroecological practices, new crop varieties, implements and inputs and their availability and accessibility at individual and community level. For example, the introduction of short-duration sorghum varieties in Ghana enabled farmers to adapt to shorter growing seasons as a result of climate change.
- **Prices and markets** influence choice of crops and livestock. This includes demand for and price of produce at harvest time as well as the price and availability of food and other commodities at the time when farmers wish to buy them. In Malawi, farmers' decisions to grow groundnuts as a cash crop is a direct result of high demand (domestically and in neighbouring countries). Crop choices and input prices (eg fertiliser) influence input use and SAI practices.
- Access to **credit and subsidies** affects the availability and affordability of inputs and

Figure 1. A snapshot of household diversity: Upper West Region, Ghana

The land farmed by two households in the same area can vary hugely, by size and crop choice. This is just one aspect of diversity: there are many more layers of complexity to every household, including people (representing both needs and labour/income available) and any external support received (which may influence farming practices, such as use of fertiliser).

Household A: established and older

Household B: young and resource-poor



implements. In Ghana, subsidised tractor ploughing services enabled this practice to spread, even in remote locations. However, farmers relying on loans to purchase external inputs — while facing high levels of production and marketing risks (due to, for example, pest and disease attacks and droughts) — can be trapped in a vicious cycle of debt and coping strategies, as observed in Ghana and Malawi.⁹

Table 1. Trade-off categories, related decisions and potential synergies: some examples

Trade-off category	Option/decision	Potential synergy
Within dimensions (eg economic)	Grow crops for cash, or crops for household consumption?	Cash income from crop sales could be used to buy food
Between dimensions (eg economic and environmental)	Land preparation by tractor (timely, but requiring removal of trees), or by manual labour (slower, but enables farmer-managed natural tree regeneration)?	Appropriate mechanisation (eg animal-drawn) allows fast land preparation as well as preservation of trees
Between timescales (eg invest now for long-term benefits, or reap short-term benefits now but lose out in the long term)	Invest in soil and water conservation/ integrated soil fertility management, or use only inorganic fertilisers? Invest in children's education, or give children work on the farm?	Use both for maximum benefits (but requires incentives and technical support) Children can learn useful skills from part-time farm work
Between spatial scales (eg household and landscape level costs and benefits from irrigation)	Individual benefits from cultivation along riverbeds, or collective benefits from the sustainable management of streams and banks?	Responsible irrigation management can maintain benefits to the individual without environmental damage
Between types of people	Protect crops from herders' livestock, or protect herders' livelihoods?	Regulated grazing both serves herders and gives farmers access to manure

- **Training and awareness-raising** programmes from government and development agencies introduce farmers to new technologies and practices and provide varying degrees of technical support, through extension staff, lead farmers, information and communication technologies and so on. However, these programmes can send conflicting and undifferentiated (by household type) messages, depending on the vision of the funder or the entity delivering training. For example, in Ghana, tractor ploughing promoted by the government addresses climate risks to some extent but also facilitates the expansion of agricultural lands into grazing areas and wood lots, disincentivising the protection and regeneration of trees under Farmer Managed Natural Regeneration (FMNR) initiatives.
- The extent and nature of smallholders' **social organisation**, which enables development organisations and others to target particular groups, such as women, young people and poorer farmers. Development programmes have supported informal and traditional networks as a route to help particular groups access financial resources or to support knowledge exchange.

Most farmers seek to support their own priority objectives by combining advice received from previous programmes. But this often means that short-term (largely economic) benefits are prioritised over long-term large environmental and social ones, as in particular poorer farmers are unable to recalibrate objectives and invest in the future. This phenomenon of 'lock-in' was highlighted by the 2016 IPES-Food report¹⁰ — if its underlying causes are not addressed, poorer farmers in particular will continue to be forced to make choices that are not sustainable.

Conclusions

Farmers are largely making rational choices to manage trade-offs to meet immediate household needs. That involves meeting priority needs through adaptation or partial adoption of practices, in line with available resources. This is in stark contrast to the prevailing logic of SAI promotion, which relies on the adoption of specific practices and technologies,

Notes

¹ African smallholder farmers group (ASFG) (2013) Supporting smallholder farmers in Africa: A framework for an enabling environment. ASFG, London. / ² Klapwijk, C.J., van Wijk, M., Rosenstock, T.S., van Asten, P.J.A., Thornton, P.K. and Giller, K.E. (2014) Analysis of trade-offs in agricultural systems: current status and way forward. *Current Opinion in Environmental Sustainability* 6, 110–115. / ³ For information on IIED's role in the SITAM project please visit: iied.org/trade-offs-sustainable-intensification / ⁴ Zongo, A-F, Allen, M., Batchéné, H., Bourgou, T., Sigué, H. and Zomboudré, G. (forthcoming) *Compromis dans l'intensification durable de l'agriculture : études de cas dans deux villages du Burkina Faso*. IIED, London. / ⁵ Dakyaga, F., Derbile, E.K., Naaze, G.K., Faamuo Tampulu, S., Faabelangne Banuoku, D., Beyuo, E., Betiera Niber, E. and Gubbels, P. (forthcoming) *Trade-offs in sustainable intensification: Ghana country report*. IIED, London. / ⁶ Bwanausi Kabuye, N. and Adolph, B. (forthcoming) *Trade-offs in sustainable intensification: Malawi country report*. IIED, London. / ⁷ SAI was widely adopted after the UK's Royal Society highlighted "the pressing need for the "sustainable intensification" of global agriculture in which yields are increased without adverse environmental impact and without the cultivation of more land". Royal Society (2009) Reaping the benefits. Science and the sustainable intensification of global agriculture. RS Policy document 11/09, Royal Society, London. / ⁸ Musumba, M., Grabowski, P., Palm, C. and Snapp, S. (2017) *Guide for the Sustainable Intensification Assessment Framework*. USAID/Feed the Future, Washington DC, USA. / ⁹ See also Mvula, P. and Mulwafu, W. (2018) *Intensification, Crop Diversification, and Gender Relations in Malawi*. In: Andersson Djurfeldt, A., Mawunyo Dzanku, F., Cuthbert Isinika, A. (eds) *Agriculture, Diversification, and Gender in Rural Africa. Longitudinal Perspectives from Six Countries*. Oxford University press, 158–175. / ¹⁰ IPES-Food (2016) *From uniformity to diversity: a paradigm shift from industrial agriculture to diversified agroecological systems*. International Panel of Experts on Sustainable Food Systems, Brussels. / ¹¹ Woltering, L., Fehlenberg, K., Gerard, B., Ubels, J. and Cooley, L. (2019) *Scaling – from "reaching many" to sustainable systems change at scale: A critical shift in mindset*. *Agricultural Systems* 176, 102652. / ¹² Toulmin C. (2020) *Land, investment, and migration: Thirty-five years of village life in Mali*. OUP, London.

often packaged in fixed strategies. To bridge this gap, top-down interventions and inputs must better consider the diversity of farming households and their needs and capacities.

The wider socioeconomic, environmental and institutional context could better support farmers to manage competing objectives. Heavy promotion of individual technologies or fixed packages must shift toward encouraging systematic changes in farming systems, in the wider agroecological landscapes, and in rural communities. To achieve this, the financial and technical support available to farmers should better support investment in assets and adopting practices that deliver long-term benefits, such as long-term soil and water conservation, appropriate mechanisation and developing institutions that can support transformational processes. The poorest farmers should be prioritised.

Farmers are intensifying their agricultural production to adapt to a diminishing natural resource base. The challenge is to gear intensification towards a more balanced approach that encompasses long-term environmental impacts. Different types of farmers will require different types of support in order to both meet their short-term objectives and contribute to long-term goals that are relevant not just to their children, but to the wider community. Supporting farmers to find and use synergistic practices will help them to meet multiple objectives across sustainability domains and timescales, as well as to avoid dangerous and unsustainable 'lock-in' situations.

Finally, the enabling factors must operate at a system level.¹¹ This requires long-term commitments from government, donors and development agencies. It is unfair and unrealistic to ask farmers in some of the poorest parts of sub-Saharan Africa to prioritise sustainability unless governments and development agencies can also move past a focus on 'quick wins' within election or project cycles.

Barbara Adolph

Barbara Adolph is a principal researcher in IIED's Natural Resources Group.



Knowledge Products

The following organisations were partners on this project:

IIED, ANSD (Association Nourrir sans Détruire), CIKOD (Centre for Indigenous Knowledge and Organisational Development), Groundswell International, INERA (Institut de l'Environnement et de Recherches Agricoles), LUANAR (Lilongwe University of Agriculture and Natural Resources), Practical Action Consulting, TLC (Total LandCare), UDS (University for Development Studies), Wageningen University (Farming systems ecology group). For more information, visit www.iied.org/trade-offs-sustainable-intensification

Contact

Barbara Adolph
barbara.adolph@iied.org

80–86 Gray's Inn Road
London, WC1X 8NH
United Kingdom

Tel: +44 (0)20 3463 7399
www.iied.org

IIED welcomes feedback via: @IIED and www.facebook.com/theiied

ISBN 978-1-78431-787-4

The SITAM project was funded by the Sustainable Agricultural Intensification Research and Learning in Africa (SAIRLA) programme. The SAIRLA programme was funded by the UK Department for International Development and managed by WYG International Ltd and the Natural Resources Institute, University of Greenwich.

