

Agroforestry, a landscape approach

From promoting specific agroforestry technologies to advocating a portfolio of tree options within the landscape

In recent years there has been a shift in thinking about the best way of achieving an impact with agroforestry, says Fergus Sinclair, leader of agroforestry systems research at the World Agroforestry Centre. “In the past we would pilot agroforestry technologies intensively in one village. The idea was, if it works in one place it will work in others. But that is not enough for donor organizations anymore. They want to see wide-scale adoption.”



Trees perform valuable watershed functions (Photo: World Agroforestry Centre)

This thinking has resulted in a new research approach, from focusing on design of interventions at pilot sites to offering appropriate tree species and management options across landscapes. These may stretch over large ecological zones. World Agroforestry Centre (ICRAF) research on fertilizer trees in southern Africa for instance shows that the suitability of species like *Sesbania* or *Tephrosia* that can improve maize yields depends on where they are planted. “There are no silver bullet agroforestry technologies, but rather a need to customize promising options to fit local circumstances and to support farmers in trying these out,” says Sinclair. “In the past we would tell farmers, you have to do this. For some it worked, for others it didn’t. Now we say, there are several options and they choose.”

Doing this effectively requires combining the most up-to-date science with local knowledge. World Agroforestry Centre scientists work on developing practical tools and approaches that can be used by extension agencies and Non governmental organisations (NGOs) to support smallholder farmers in establishing and managing tree resources in their fields, farms and landscapes.

Polyscape, mapping agroforestry options

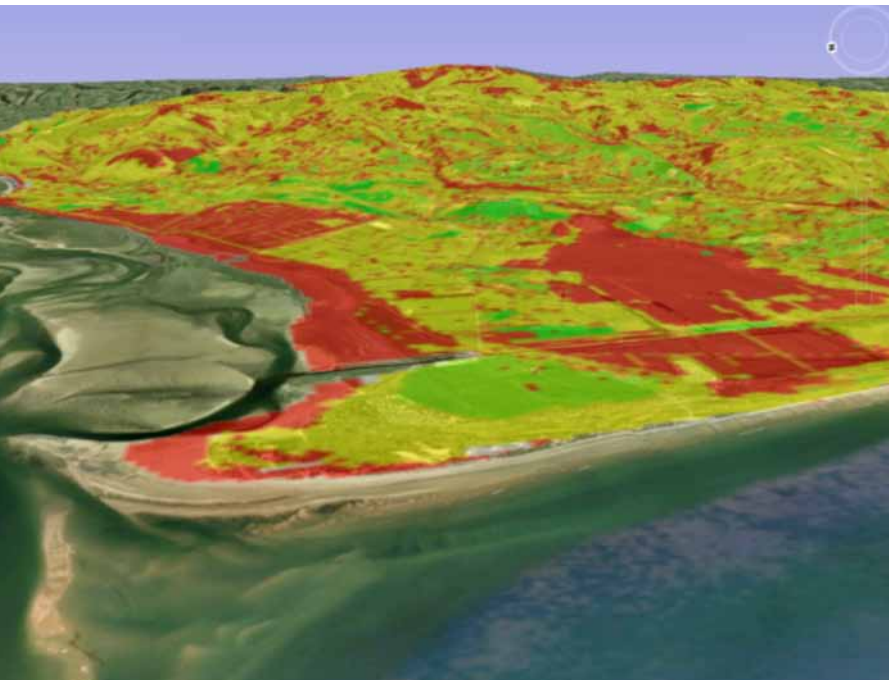
One of the decision support tools the World Agroforestry Centre is developing is called Polyscape. It is a negotiation support toolkit that can be used to map ecosystem services from rural areas to improve the management of multifunctional landscapes, with trees, agricultural land and other land uses. “It connects farmer actions to landscapes,” says Sinclair. “Most environmental and agricultural policies are made at national or regional level. While individual farmers make decisions that affect ecosystem services, such as which trees to cut, Polyscape bridges this divide.”

Polyscape is a negotiation support tool that maps how changes in land use at the field level, for instance tree cover, influence a range of ecosystem services. It combines information on aspects such as agricultural production, water regulation, sediment flow and carbon storage. The participatory tool allows stakeholders – farmers, ministries of water,

agriculture, environment, etc. – to jointly explore how different land use scenarios affect each ecosystem service individually and agree on best policies. Sinclair calls this research embedded in the development process, research ‘in’ development. Using the Polyscape tool and maps it generates, makes it possible to see where in the landscape (agroforestry) interventions will be most effective for achieving different ecosystem management objectives.

Originally developed through participatory research with Welsh farmers and other environmental stakeholders in the UK, where it has influenced government policy, it is now being adapted for use in Africa and throughout the developing world. The tool is currently being tested at various sites in Ethiopia, Zambia and Tanzania (see box).

“Our vision with Polyscape is to achieve well-managed appropriate diverse tree cover across Africa and Asia,” says Sinclair, “by applying more participatory approaches that use better data, so a better job can be done to provide farmers with suitable agroforestry options.”



A Polyscape map with several combined layers: agriculture, surface water run-off and habitat connectivity. The red parts indicate areas where current land use should be maintained, while green highlights areas where land use change is required. (Image: World Agroforestry Centre)

Selecting suitable tree species to stop soil erosion around Lake Tanganyika

In Tanzania, World Agroforestry Centre scientists assisted in a World Bank project to reduce sediment flow into Lake Tanganyika. The scientists came in with state of the art maps of ‘degradation hotspots’ and combined these with local knowledge and natural vegetation maps. These were put together in a Polyscape tool to customize agroforestry options for sediment control, for example by planting trees along rivers or headwaters.

Initially the project was planning to plant eucalyptus trees with woodlots for timber. The Polyscape tool came up with a more tailored suite of tree options for different altitudes and areas. Instead of an extension manual, an extension worker would go to farmers with a little spreadsheet with different options. Eventually 2 million trees – including 85000 native species – were planted across the watershed by 1000 farmers. “We have changed the behaviour of implementing organizations,” argues Sinclair. “The tools are simple enough to use, but sophisticated in what they are doing. This is proof of concept that is applicable to other areas.”



Scientists and extension workers interacting with the local community during the Lake Tanganyika Integrated Management Project (Photo: ICRAF/ Valter Ziantoni)



For more information, visit www.worldagroforestry.org and search keywords ‘agroforestry systems’ or ‘Polyscape’



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