

# *les dossiers* **d'AGROPOLIS** INTERNATIONAL

*Expertise of the scientific community*

Special Partnership Issue



## **Agroecological transformation for sustainable food systems**

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AED should be systematically built on the characterization of **biophysical processes**, with a focus on their interactions at relevant scales, e.g. product types and quantities, pest and disease regulation, and nutrient cycling. Moreover, AED also should account for **management processes** at field and farm scales, e.g. available time, space and money, field techniques, end-product types and qualities and their links to value chains. **Integrating this data constitutes a wager and often a lock-in** that hampers optimum sustainable use of available resources (biophysical or managerial). Yet such characterizations—beyond their complexity—very often underline **trade-offs** between these processes<sup>(3)</sup>. These trade-offs should systematically be discussed with stakeholders and, when agroecological management initiatives are implemented, **stakeholders' goals and perceptions** of sustainable/ecofriendly agricultural management reveal **another set of lock-ins**. For instance, when implementing practices to boost soil carbon sequestration, it is essential to address challenges like knowledge

voids, increased difficulty in conducting fieldwork, or risk handling and social pressure<sup>(4)</sup>. Step-by-step, R&D is striving to tackle these lock-ins and open the way to inclusive local knowledge, (co)innovation support and on-field experimental setup. This involves rethinking both agroecosystem modeling and its integration at multiple scales, while developing new multicriteria assessment approaches. Such approaches are currently being implemented in a wide range of projects\*.

\*Projects

COCOA4FUTURE, Putting people and the environment back at the heart of cocoa growing: [www.cirad.fr/en/news/all-news-items/press-releases/2021/cocoa-growing-agroforestry-west-africa](http://www.cirad.fr/en/news/all-news-items/press-releases/2021/cocoa-growing-agroforestry-west-africa)  
DSCATT, Agricultural intensification and dynamics of soil carbon sequestration in tropical and temperate agricultural systems: <https://dscatt.net/>  
BOOST, Collaborative platform on agroecological transition: [www.boost-ae.net/en/1/home.html](http://www.boost-ae.net/en/1/home.html)  
FAIR, L'intensification agroécologique pour la résilience des exploitations dans le Sahel: [www.fair-sahel.org/](http://www.fair-sahel.org/)  
STRADIV, System approach for the transition to biodiversified agrosystems: <https://stradiv.cirad.fr/>  
ASSET, Agroecology and safe food system transitions in Southeast Asia: <https://ur-aida.cirad.fr/en/our-research/research-projects-and-expertises/asset>

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# Promises and limits of agroecology in sub-Saharan Africa

*An illustration in the Hautes Terres region of Madagascar*

There are three recognized ways of greening agriculture. Agroecology 'of practices' aims to transform 'conventional' systems but without affecting agrifood system governance or the priority of maximizing volumes and profits. Ecological intensification of practices concerns systems that have been barely

or not at all impacted by the Green Revolution. Finally, integral agroecology, i.e. systemic and territorial, is more political and advocates a break with industrialization while striving to optimize a set of services in a balanced system. The prospects of these different approaches are presented with regard to their application in the *Hautes Terres* region of Madagascar. Despite the real potential for development, agricultural policies focused on conventional intensification (widely promoted) or on ecological intensification of farming practices have had little impact in this region.

The Analamanga, Itasy and Vakinankaratra regions of Madagascar hosted more than 800,000 farms in 2018, compared to 540,000 in 2005. This led to an almost twofold decrease in the average size of family farms (currently less than 1 ha). Resources and production capacities are so limited that agricultural innovations in the form of simple technical packages have little impact. Innovations must apply to the overall and yet quite diversified activity system—including off-farm

activities—in order to have an impact in the best-off family farms. Yet these innovations will not be sufficient unless accompanied by economic diversification within the region. In the *Moyen Ouest du Vakinankaratra*, i.e. a less saturated region, agricultural development is hampered by the lack of elementary services, in quantity and quality (health, education, roads, market equipment and, above all, security). **Technical responses are therefore ineffective levers. Structural bottlenecks stand in the way of positive change without massive and coordinated public action at the farm, sectorial and territorial levels. Agroecological strategies must therefore be integral, jointly oriented towards systemic and territorial approaches.** Technical solutions will only be able to offer real leverage to families in the *Hautes Terres* region when a favorable socioeconomic environment prevails.

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