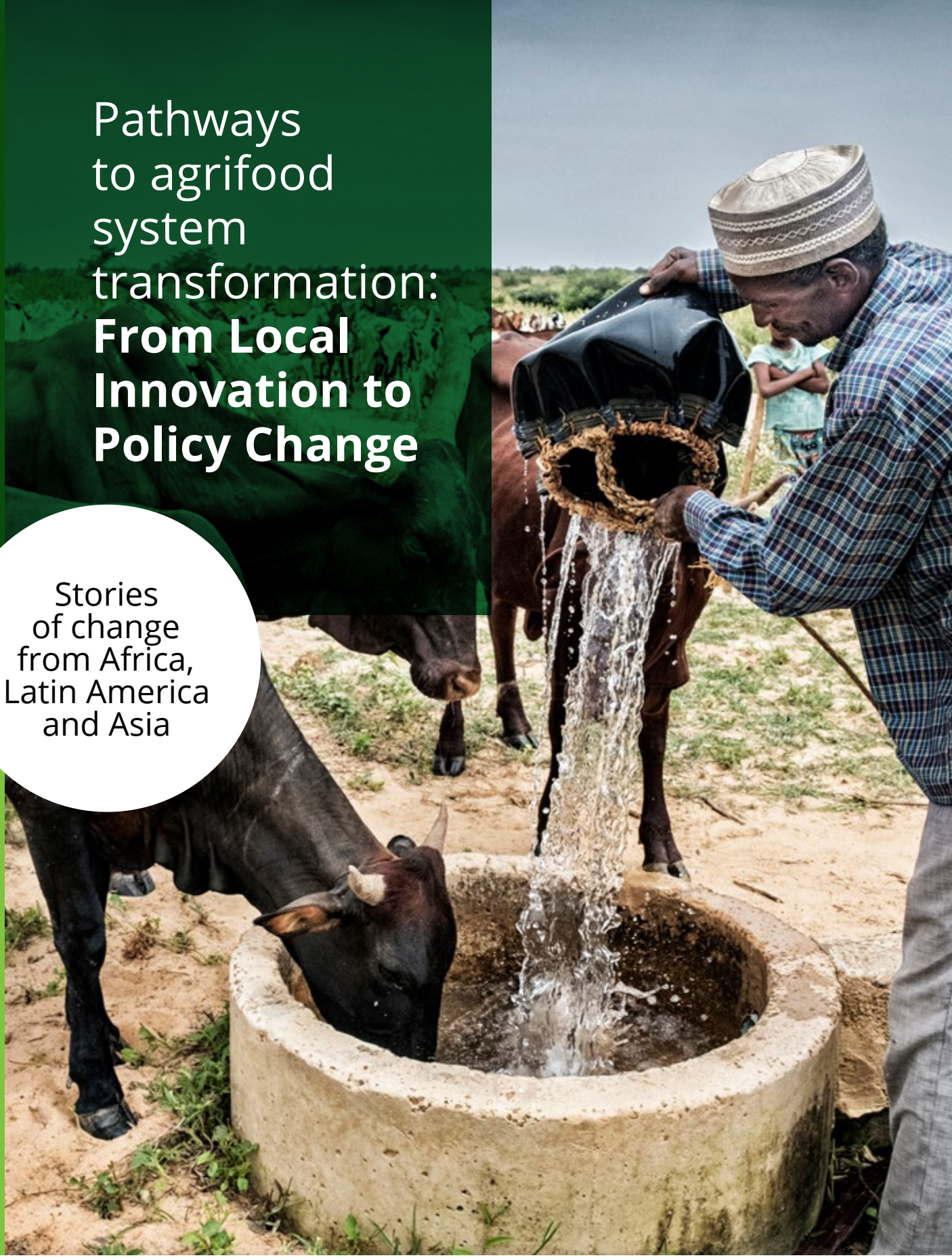
Pathways to agrifood system transformation: **From Local Innovation to Policy Change**

Stories of change from Africa, Latin America and Asia



DeSIRA LIFT

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Bringing farmers together in clusters for better outcomes

As the project targeted the poor small-scale farmers, there was no possibility to work with farmer groups or associations – in Cox's Bazar, small-scale farmers are not organised and they have no habit of collective action. To avoid creating inequality and conflicts in neighbourhoods between beneficiaries and non-beneficiaries of the project, and to facilitate training delivery and peer-to-peer learning, the project team decided to work with clusters of 20-25 neighbouring farmers rather than with individual farmers dispersed around the zone. This approach paid off also when the project started working on marketing strategies. The project team realised that without links to markets *Artemia* production could not be sustained, as farmers were producing more *Artemia* than they could use.

Salt farmers had no links with shrimp hatcheries and no experience in marketing the new product. A member of the project's steering committee, representing the association of shrimp hatcheries, suggested that the project connects farmers with the marketing agents working for the association. This suggestion was welcomed by the project team and the connection made. As the farmers were organised in clusters, it allowed them to negotiate a better price together instead of lowering their prices to compete against other individual farmers.

Local hatcheries became successful users of live *Artemia* biomass as a result of the link with local *Artemia* producers facilitated by the project. *"Despite the huge demand for Artemia in the country, it had to be imported from abroad as it was not produced. Artemia biomass as live feed for domesticated shrimp broodstock increases its fecundity rate,"* said Mainuddin Ahmed, owner of the MKA specific pathogen free shrimp hatchery in the Sonarpara hatchery zone. Also, the shrimp farmers were convinced of the interest of using *Artemia* biomass to grow their shrimps by observing the results obtained by the project participants. *"I was astonished by the impressive growth and survival rates of shrimp achieved through the use of Artemia biomass. Many neighbouring shrimp farmers visited my farms when I harvested juveniles,"* said Norul Kabir, a seasoned shrimp farmer from Teknaf who participated in the project.

Farmers taking initiative to sustain *Artemia* production Aquaculture in Cox Bazar now contributes to 30-50% of the annual income of the participating salt farmers, whereas this contribution was marginal before the project. Success stories from many farmers help to sustain interest in *Artemia* production in Cox Bazar, even despite some bumps on the road. During project implementation, there was a significant increase in fuel prices, increasing the cost of pumping water, which is necessary for growing *Artemia*. But farmers wanted to continue the production and found a way to overcome this inconvenience by introducing solar energy to operate their pumps. Another farmers' initiative was to ask the project to make frozen storage available to preserve some biomass to ensure its availability during the rainy season. Deep freezers were provided to clusters. After the project ended in 2024, several farmers who were brought into clusters by the project continued to work together.

Creating conditions for *Artemia* to grow

The project partnered with governmental and non-governmental organisations, national and foreign universities, private companies, shrimp/fish hatcheries, salt/shrimp/fish/crab farmers, marketing agents and clusters of farmers, and facilitated knowledge sharing between these actors and beyond. Workshops were organised at national and international level, and participants could interact during exchange visits and consultation meetings. Besides handbooks, training manuals and other extension support materials, the project also published a cookbook with *Artemia* biomass as human food recipes.

The Department of Fisheries of the government of Bangladesh played a central role in exploring the potential, and in planning and coordinating the scaling of these innovative technologies. Participation of the Department of Fisheries and the Bangladesh Small and Cottage Industries Corporation (BSCIC) added reliability to the project and contributed to increasing its acceptance by a wide range of stakeholders, which played a role in facilitating the continuation beyond the project period. Private-sector engagement and networking among value chain actors remain crucial for driving the growth of *Artemia* culture in salt farms. These collaborations help strengthen the industry by facilitating knowledge exchange, technology adoption and market access, all of which are essential for the sustainable expansion of *Artemia* production. And the potential for expansion is big: there are 50 000 salt farmers, 300 000 shrimp and prawn farmers, and 35 million people living in the coastal areas of Bangladesh.

Cultivating fields of possibility
enabling the agroecological transition of market vegetables production in Côte d'Ivoire

Authors: Thibaud Martin, project leader, CIRAD; Euphrasie Angbo, WP 1 coordinator, ESA-INPHB; Angel Angbo, WP 2 coordinator, CIRAD

The vegetable value chain in Côte d'Ivoire is undergoing transformation. Through the MARIGO project, traditional farming practices burdened by heavy pesticide use and marketing struggles are giving way to a more harmonious approach. The project supports the agroecological transition by intervening at both the production and marketing levels. Vegetable producers experiment with or observe sustainable practices and then they expand their perspective as part of a broader agrifood system. A new participatory certification system is the culmination of the process which strives to bridge the gap between conscious producers and cautious consumers, weaving a future where sustainable farming can truly flourish. By engaging farmers and other value chain actors in this process, exposing them to new possibilities and encouraging exploration, MARIGO helps participants take ownership of the transition, ensuring long-term change beyond the project's direct influence.

Vegetables constitute the main source of vitamins and nutrients for populations in Côte d'Ivoire, while growing and selling them secures livelihoods of many, especially in urban and suburban areas, where they are grown in community gardens. However, to provide access to healthy food for consumers and sufficient income for producers, both the production and marketing of vegetables in the country need to be improved.

Most Ivorian vegetable producers apply unsustainable farming practices, especially for soil fertilisation, plant protection and post-harvest, leading to both environmental issues and suboptimal economic benefits. Producers often opt for monocropping and use large amounts of synthetic pesticides as their main form of pest control at every production stage, and still their yields are generally low. These conventional practices have a negative effect on the sanitary quality of vegetables, limiting access of consumers to healthy products. In addition, vegetable production is not very diversified in the country, overlooking the potential of indigenous leafy vegetables which are rich in vitamins and minerals and thus highly interesting from a nutritional point of view.

On the marketing side, without the support of an organised supply chain or a cooperative system aimed at providing access to the local market, vegetable producers are generally left to their own devices to market their crops.

Igniting innovation processes

This was the prevalent situation until the start of the 2019 project Agroecological Transition of Market Gardeners in Ivory Coast (TAMCI) that aimed at developing improved crop-management techniques. During its implementation, a group of 25 producers from Yamoussoukro were trained to diversify their production and to adopt agroecological practices such as the use of organic fertilisers, crops association and rotations,

local micro-organisms as means to improve soil health and help fight plant pathogen such as bacterial wilt, biopesticides and others. Following this training, they formed the Yamoussoukro Association of Agroecological Market Gardeners (AMAYA) to further develop their agroecological farming practice. This pioneer association is now involved alongside other groups of producers in the DeSIRA project "Development of an agroecological peri-urban market gardening – MARIGO", launched in 2021. MARIGO builds on the foundation laid by TAMCI to advance the agroecological transition in market vegetable production. It also incorporates key elements of the One Health framework which emphasises the interconnectedness of human, animal, plant and soil health, along with components of value chain strategies.

As part of MARIGO, the French agricultural research and international cooperation organization working for the sustainable development of tropical and Mediterranean regions (CIRAD) trained the producers of AMAYA and other farmer organisations on sustainable farming practices, such as crop diversification (i.e. including onion in the rotations), intercropping and efficient crop rotations, the use of readily available non-industrial organic fertilisers (which involved mapping of locally available organic matter) and the preparation of their own organic pesticides (i.e. plant-based pesticides), among others. After completing their training, the gardeners have adopted a set of practices that promote healthy living. *"Today, I have a diversity of crops in my field and I use organic inputs. This has improved my general health and wellbeing, as well as increased my income",* shared Sylvie Zounon, one of the participants. *"Women's groups have received training from MARIGO and are fully committed. They produce bio-inputs and fight insects with biopesticides made from plants. They also raise snails for food and calcium production. Oddly enough, there are fewer insects now in the potato, eggplant and okra fields. We use snails, they are not pests, they eat other plants in the potato field. As we need calcium for biopesticides, we use snail shells as a source,"* told Sédric Konan from San Pedro during a workshop on pesticide reduction, another activity co-organised by MARIGO and the Pretag[1] initiative.

The project established demonstration sites at the farms of early adopters of agroecological strategies to showcase the benefits of agroecological techniques and to enable discussion of the merits of the technologies among neighbours and within the surrounding communities. "The main problems that we had were soil depletion due to the excessive use of synthetic fertilisers and pesticides, coupled with a dependence on increasingly expensive mineral fertilisers," recalls Auguste Kouamé, a member of AMAYA. "Through projects like TAMCI and MARIGO, producers have been able to experiment with different practices and talk about them to their neighbours. Some of them are surprised when they see that we can produce without pesticides. In our association, there were eight of us at the beginning, we are now 40. We share knowledge on our practices and our socio-economic results among peers," he adds.

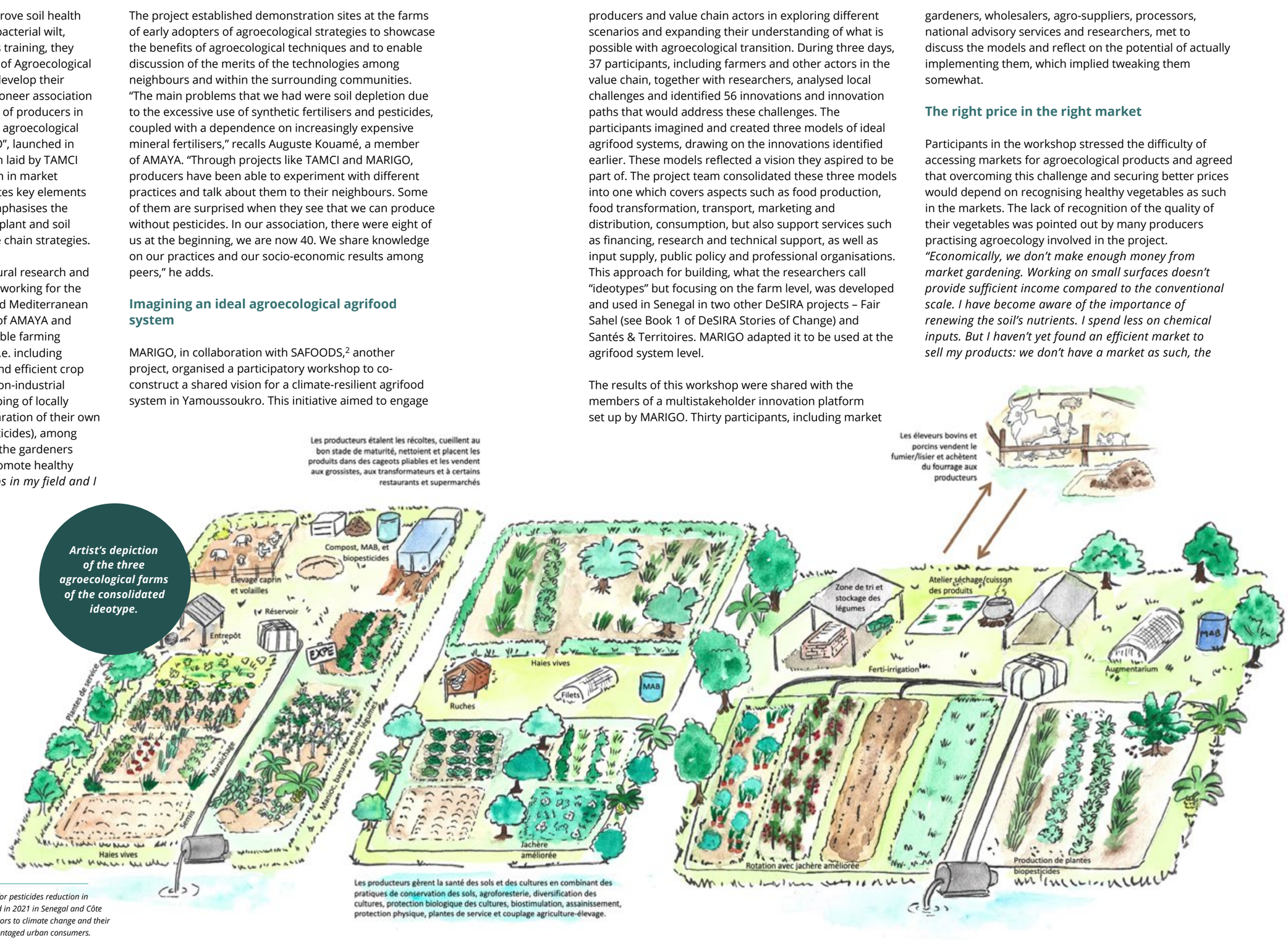
Imagining an ideal agroecological agrifood system

MARIGO, in collaboration with SAFOODS,[2] another project, organised a participatory workshop to co-construct a shared vision for a climate-resilient agrifood system in Yamoussoukro. This initiative aimed to engage producers and value chain actors in exploring different scenarios and expanding their understanding of what is possible with agroecological transition. During three days, 37 participants, including farmers and other actors in the value chain, together with researchers, analysed local challenges and identified 56 innovations and innovation paths that would address these challenges. The participants imagined and created three models of ideal agrifood systems, drawing on the innovations identified earlier. These models reflected a vision they aspired to be part of. The project team consolidated these three models into one which covers aspects such as food production, food transformation, transport, marketing and distribution, consumption, but also support services such as financing, research and technical support, as well as input supply, public policy and professional organisations. This approach for building, what the researchers call "ideotypes" but focusing on the farm level, was developed and used in Senegal in two other DeSIRA projects – Fair Sahel (see Book 1 of DeSIRA Stories of Change) and Santés & Territoires. MARIGO adapted it to be used at the agrifood system level.

The results of this workshop were shared with the members of a multistakeholder innovation platform set up by MARIGO. Thirty participants, including market gardeners, wholesalers, agro-suppliers, processors, national advisory services and researchers, met to discuss the models and reflect on the potential of actually implementing them, which implied tweaking them somewhat.

The right price in the right market

Participants in the workshop stressed the difficulty of accessing markets for agroecological products and agreed that overcoming this challenge and securing better prices would depend on recognising healthy vegetables as such in the markets. The lack of recognition of the quality of their vegetables was pointed out by many producers practising agroecology involved in the project. *"Economically, we don't make enough money from market gardening. Working on small surfaces doesn't provide sufficient income compared to the conventional scale. I have become aware of the importance of renewing the soil's nutrients. I spend less on chemical inputs. But I haven't yet found an efficient market to sell my products: we don't have a market as such, the*



Artist's depiction of the three agroecological farms of the consolidated ideotype.

1] Pretag initiative: Scientific and partnership approaches for pesticides reduction in tropical agricultures. 2] The SAFOODS project was launched in 2021 in Senegal and Côte d'Ivoire to improve the resilience of fruit and vegetable sectors to climate change and their contribution to the food and nutritional security of disadvantaged urban consumers.

market price is practically the same for agroecology as for conventional agriculture," shared Raimond Koffi during a workshop on pesticide reduction. With respect to recognition of the quality of the agroecological vegetables, Sylvie Zounon from Yamoussoukro expressed the following: *"Since I have been in agroecology, I have noticed that (agroecological) products spoil less quickly, they last longer without wilting. Wholesalers say the opposite, some of them see the traces of chemical products on the skin of vegetables as a sign of quality, they think the consumers will say to themselves that the product is treated and will resist longer, keep better".* Sylvie is among those producers who do not only sell to wholesalers. She has her close network of urban consumers, who are willing to pay a little more to get better quality vegetables. So does Jean-Paul Ago from AMAYA, who says: *"My vegetables are the preferred choice on the Yamoussoukro market because they taste better and last longer".* But these examples are exceptions rather than the rule. In a study about the willingness to pay for organic vegetables, focusing on 2 189 urban and peri-urban heads of households in Côte d'Ivoire, MARIGO researchers found that 58% of consumers were prepared to pay more for organic vegetables, but most of them only 10% more, even if they knew it was better for their health. The willingness to pay was further reduced in Abidjan by the lack of certification.

The opportunity to stand out: the participatory guarantee system

This led MARIGO to address the issue of how to facilitate the sale of such vegetables at a better price. Certification and labels are common answers to remedy the lack of recognition. However, labels for organic or agroecological vegetables do not currently exist in Côte d'Ivoire. MARIGO thus supported the Labelivoire[3] initiative, aiming at developing the first national label for organic agriculture in the country. The activities were carried out by Nitidæ, a partner of the MARIGO project, and AIER, an association of farmer groups interested in promoting agroecology or organic farming in Côte d'Ivoire. Among all interested stakeholders, including 40 farmers, they co-constructed a charter defining technical specifications to be met to obtain the label during a series of workshops held in Abidjan, Yamoussoukro and Bouaké. They also analysed and compared five existing African labels and their control systems to identify what could fit better the context of Ivorian agriculture, and the actual diversity of agroecological farms. The label they eventually came up with was called Organic Ivoire PGS. The labelling procedure is guaranteed by the Association for Organic Agriculture in Côte d'Ivoire 2AB-CI. A multistakeholder participatory guarantee system (PGS) committee is established within the association, composed in majority of certified organic farmers who are meant to assure the control by peers. The label is presented as PGS, as the technical specifications have been developed in a participatory manner, however, the labelling procedure still involves a third party (the association), which does not exploit the full potential of the participatory guarantee system. PGS can be more locally focused, adapted to local markets and short supply chains, involving the producers with their direct consumers, without the involvement of a third party (which reduces the cost of labelling).

To further explore the potential and challenges of PGS and share knowledge among stakeholders, MARIGO organised the first regional meeting of PGSs of West and Central Africa. It brought together 37 participants from 13 existing or emerging PGSs from Benin, Burkina Faso, Cameroon, France, Ghana, Guinea-Bissau, Mali, Nigeria, Senegal and Togo. Key issues addressed included how to ensure horizontal organisation and involvement of all peers, and how the PGS can be financed, among others. The participants agreed on several propositions on how to improve the marketing of their products: strengthen and encourage interaction between different countries, expand sales options (shops, organic markets and baskets, etc.); better diversify to satisfy producers' needs and improve product presentation. The 13 PGSs signed a joint declaration, in which they committed to several actions, such as, among others, capacity building and information sharing through WhatsApp groups; harmonisation of databases to allow capitalisation and joint dissemination of data, and finally institutionalisation of regional PGS meetings.

Some conditions for further advancement

In sum, MARIGO intervenes at both the production and the marketing side to enable first steps in the agroecological transition of market vegetable production in Côte d'Ivoire. Starting at the farm level, where vegetable producers can experiment or see the results of the experiments of others, then inviting these farmers to imagine their farms as part of a larger agrifood system, and finally providing a space to learn from a larger network about the concrete ways in which their new value chain can be developed, provides a base to advance innovation processes. The transition pathway to continue and deepen agroecological transition in the future remains largely to be imagined. Involving the producers and other actors of vegetable value chains in this process, opening them to new possibilities and encouraging them to explore different options, creates conditions for them to take ownership of the process and drive the change in the future, beyond what MARIGO can accomplish.

3] The Labelivoire project (funded by the PAFAO program) aims to create an Ivorian organic label to promote local products; it is based on the SPG (Participatory Guarantee System) model.

7 CULTIVATING FIELDS OF POSSIBILITY

Watering tomatoes in Yamoussoukro.