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T20 POLICY BRIEF

Task Force 01

FIGHTING INEQUALITIES, POVERTY, AND HUNGER

Agrobiodiversity as an Approach towards Food and Nutrition Security for Rural Communities in Africa and India

Kritika Banerjee, Senior Editor, Solidaridad Asia (India)

Shoba Suri, Senior Fellow, Observer Research Foundation (India)

Godlove Nderingo, Senior Project Manager, Solidaridad East & Central Africa (Tanzania)

Suresh Motwani, General Manager, Solidaridad Asia (India)

Prashant Pastore, Asia Head – Water & Sustainable Agriculture Programmes, Solidaridad Asia (India)



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Abstract

The lack of agricultural biodiversity in farming systems threatens nutritional security for nearly 3 billion people in India and Africa. The homogenization of agricultural production systems, driven by intensification of agri-practices, specialization by breeders, and homogenizing effects of globalization, contributes to agrobiodiversity loss, limiting people's access to diverse and nutrient-rich food and contributing to the malnutrition burden. In India and Africa, 224.3 million and 278 million people are undernourished.

Ensuring the sustenance of agrobiodiversity is crucial for addressing the nutritional needs in India and Africa. **In India**, diversification within the soy-based cropping system has improved farm income and local availability of nutritious and affordable food. A campaign on dietary needs for children and women is improving the consumption of nutritious foods through sustained behavioral change. **In Tanzania**, rural communities have seen enhanced food and nutrition security as well as land productivity due to improved access to extension services and essential farm inputs, as well as integrated climate-resilient and sustainable farm practices.

With evidence from the case studies, we call on the G20 to:

1. Invest in agroecological farming methods with farmers as key stakeholders, foster collaboration between states, NGOs, and local communities to implement such initiatives and integrate them into existing schemes
2. Promote integrated crop-livestock systems to enable smallholders access to diversified diets and income and enhanced soil fertility
3. Raise awareness about the importance of agrobiodiversity for nutrition and food security, integrate nutrition education into agri-extension services and outreach programs
4. Coordinate policy efforts across agricultural, environmental, and nutrition sectors to incentivize sustainable farming practices, conserve biodiversity, promote healthy diets

Keywords: nutrition security, food security, poverty, hunger, agrobiodiversity, SDGs

Diagnosis of the Issue

The scarcity of agricultural biodiversity within farming systems poses a significant threat to nutrition security (Hoffmann, 2021). When agricultural systems lack diversity, they become more vulnerable to pests, diseases, and environmental stresses, leading to reduced yields and limited access to a variety of nutritious foods. Additionally, monoculture practices can degrade soil health and ecosystem resilience over time, further compromising food production and long-term food security. The constriction of people's access to diverse and nutrient-rich food due to a lack of agricultural biodiversity contributes significantly to the burden of malnutrition in regions like India and Africa. In India, approximately 224.3 million people are undernourished, while in Africa, the number stands at 278 million (FAO, IFAD, UNICEF, WFP, and WHO, 2022). These staggering figures underscore the urgent need to address the underlying factors contributing to food insecurity and malnutrition, including the promotion of agricultural biodiversity, diversified farming practices, and improved access to nutritious foods for all segments of society.

Agricultural biodiversity encompasses the vast array of plants, animals, and microorganisms utilized in agriculture and food production, showcasing the richness and resilience of ecosystems cultivated by generations of farmer (Duvall et al, 2021). Firstly, agrobiodiversity provides a rich source of nutrients and dietary diversity (Luna-González et al, 2018; Adhiguru et al, 2022). Traditional crops and local varieties often have higher nutritional value than commercial monocultures. For example, indigenous varieties of millets, sorghum, and pulses in India and Africa are often more resilient to adverse environmental conditions and are rich in essential nutrients like iron, zinc, and calcium. By promoting the cultivation and consumption of these diverse crops, rural communities

can address malnutrition and achieve better overall health outcomes. Secondly, agrobiodiversity contributes to ecosystem resilience and sustainability (Kimiti et al, 2016). Diverse farming systems are more resilient to pests, diseases, and climate variability and promote sustainable agriculture. Moreover, agrobiodiversity supports cultural and traditional knowledge systems (Keyu et al, 2021). These traditions often involve the cultivation of a diverse range of crops and the use of indigenous farming practices suited to local conditions. By preserving and promoting these traditional knowledge systems, rural communities can enhance their resilience to external shocks and maintain their cultural identity.

The relevance of agrobiodiversity to the G20 lies in its potential to address global challenges related to food security, nutrition, and sustainable development. The Matera Declaration endorsed by G20 Ministers, FAO, and other UN agencies and partners, “agree to deliver on food security priorities by enhancing efforts in ensuring safe and adequate nutrition for all, ending all forms of malnutrition, preserving agrobiodiversity, as well as relying on science, innovation, advanced business practices, and responsible behavior complementing traditional knowledge, local food culture and best practices in order to achieve SDG 2 targets” (G20 Italia 2021). As major economies with significant agricultural sectors, G20 countries have a responsibility to prioritize initiatives that promote agrobiodiversity and support rural communities in Africa, India, and beyond. G20 countries can collaborate to develop policies that prioritize agrobiodiversity conservation, promote sustainable agricultural practices, and support small-scale farmers in accessing diverse seeds and breeds; investing in research, training, and extension services can enhance the capacity of rural communities to harness the benefits of agrobiodiversity and adapt to climate change; engaging the private sector in initiatives related to agrobiodiversity conservation and sustainable agriculture can leverage

resources, expertise, and innovation to achieve shared goals; G20 countries can work together to support global initiatives such as the Convention on Biological Diversity, the United Nations' Sustainable Development Goals, and the Global Alliance for Climate-Smart Agriculture, which promote agrobiodiversity conservation and sustainable agricultural development.

However, despite its myriad benefits, agrobiodiversity faces various challenges, with the expansion of industrial agriculture, land degradation, loss of traditional knowledge, and climate change posing significant threats to agricultural biodiversity (Bioversity International, 2017). Policy frameworks often favor monoculture crops and high-input agricultural practices, neglecting the importance of agrobiodiversity in ensuring food and nutrition security for rural communities (FAO and the Platform for Agrobiodiversity Research, 2011).

Tackling these challenges necessitates collaborative endeavors across various levels. Supporting small-scale farmers with access to diverse seeds and breeds, promoting agroecological farming practices, strengthening local seed systems, and integrating biodiversity conservation into agricultural policies are essential steps towards enhancing agrobiodiversity and securing food and nutrition for rural communities.

Recommendations

In our work with small-scale farmers in India and Tanzania, we found the adoption of agrobiodiversity approach unlocking doors to improved access to diverse and nutritious food for rural communities, diversification of farm income, resilience to impacts of climate change, and greater recognition of women's role as agents of behavioral change in society.

Case study 1: Enhanced food and nutrition security for coffee farmers in Tanzania

In Tanzania, around one-fifth of the families cannot afford food with "sufficient calories," and more than 50 percent "cannot afford a nutritious diet."¹ The agrobiodiversity-focused activities targeting both production and consumption of locally-available nutritious food have improved the nutritional status and income of 22,500 smallholder coffee producers in southern highlands of Tanzania, a region leading in malnutrition prevalence in the country.

Implementation model: Farmers are at the center of designing and implementing the activities of the Passport to Coffee Export program implemented by Solidaridad, an international civil society organization. The farmer field schools and demonstration plots bring farmers together to learn and practice intercropping, crop rotation, soil health management, agroforestry, integrated livestock-crop systems, and crop diversification.

These mobilized farmers to plant fruit trees such as avocado and banana, with the trees also providing shade to the coffee shrubs from direct sunlight and conserving moisture in already moisture-stressed areas. Pulses serve as cover crops for the plantation while being

¹ World Food Programme. "Tanzania." Where we work. <https://www.wfp.org/countries/tanzania>.

a nutritious source of food for the farmer's household. A total of 153 households in the community are also practicing bee-keeping, which helps with pollination in coffee farms while preserving biodiversity and diversifying farm income through the sale of honey.

Use of high-yield, disease-resistant coffee seedlings has reduced the use of agrochemicals for pest management (Coffee Berry Disease and Coffee Leaf Rust), in turn leading to conservation of pollinating insects, soil organisms (decomposers) and birds.

Additionally, 254 women have established vegetable gardens for both domestic consumption of nutritious food and their sale at local markets. Women in the community have also taken up poultry and livestock rearing, allowing their families access to nutritious food and providing them a source of income, with the farmyard manure enriching the soil and enhancing the productivity of the coffee (the primary cash crop) and other crops.

In collaboration with nutritionists, farmers have been trained on food-based dietary guidelines to encourage them to increase their nutrient intake through a diversified diet and ensure every member in the family has equal access to nutritious food, including girls and women.

The diversified farming systems, coupled with access to training and learning, has created inclusive and nutrient-positive production and consumption systems, improved farm productivity, reduced soil erosion and GHG (through agroforestry and biochar).

Case study 2: Integrating nutritional security into farming in central India

Since 2016, the India Sustainable Soy Program of Solidaridad has been working with 160,000 small-scale farmers in Madhya Pradesh and Rajasthan to address declining

agricultural productivity, make the soy value chain resilient and inclusive, and ensure the food and nutrition security of the rural communities².

Implementation model: To build resilience to climate change, the agrobiodiversity approach introduced farmers to high-yielding pest-resistant and climate-smart seed varieties, crop diversification with pulses, vegetables, and medicinal plants, intercropping, bio-based pesticides/fertilizers, efficient water management, soil health maintenance/improvement and nutrient management. Additionally, IoT-based devices provide farmers with hyper-local weather advisories on their phones, helping them farm efficiently and check crop loss.

To address the high malnutrition rate among the poor and vulnerable rural population in five districts of Madhya Pradesh, namely Sehore, Dewas, Bhopal, Ujjain, and Agar Malwa, farmers are encouraged through awareness campaigns and training to grow nutrition gardens which, besides ensuring dietary diversity for the family also provide an additional source of income. Women are key drivers of change in this program. They are trained to become community mobilizers (lead farmers) and *Nutri Sakhis* (nutrition champions) – who then share knowledge with other women on the importance of consuming locally available nutritious food, like protein-rich soy, thereby becoming agents of social and behavioral change in their communities.

As a result, around 100,530 hectares of land is now under sustainable management (including pasture) and 18,825 farmers have diversified into different crops. Nutrition gardens not only contributed to availability of fresh and nutritious vegetables for household consumption but also towards significant increase (around 39%) in income.

² Solidaridad Network. "Soy." Commodities.
<https://www.solidaridadnetwork.org/commodity/soy/>.

The multi-pronged approach has gone beyond sustainable agriculture and food security targets to also integrate nutrition security for farming communities in rural India. Crop diversification as well as access to inputs, timely and precise information on farm management practices have reduced crop losses, lowered spending and improved incomes for farmers.

Based on the evidence from the case studies, we call on the G20 to:

1. Develop agrobiodiversity frameworks as per agroecology zones with the active involvement of farmers/farmer bodies/associations/experts in designing and implementing agricultural interventions tailored to local contexts and needs.
2. Prioritize sustainable financing mechanism to support farmers to adopt agrobiodiversity practices on their farm. These could be in the form of concessional loans, specific subsidies and credits to farmers, incentivizing the transition for them.
3. Facilitate knowledge sharing and training programs that empower farmers with the skills and information needed to implement agrobiodiversity practices effectively. This includes farmer field schools, demonstration plots, and capacity-building workshops led by agricultural experts and local extension services.
4. Recognize the crucial role of women in agriculture and provide women farmers access to training resources and leadership roles to enhance their participation in agrobiodiversity initiatives.
5. Increase collaboration between governments, NGOs, private sector entities, and research institutions to leverage expertise, resources, and networks for scaling up agrobiodiversity initiatives. Public-private partnerships can facilitate technology transfer, investment in research and development, and market linkages for small farmers.

6. Integrate nutrition education into agri-extension services and community outreach programs. Provide farmers with information on the importance of diverse diets for improved nutrition outcomes. Collaborate with nutritionists and health professionals to develop tailored educational materials and messaging.

7. Coordinate policy efforts across agricultural, environmental, and nutrition sectors to incentivize sustainable farming practices, conserve biodiversity, and promote healthy diets while minimizing trade-offs and maximizing synergies between them.

Scenario of Outcomes

The adoption of agrobiodiversity initiatives requires the navigation of a complex landscape replete with various challenges and opportunities across multiple agroecological situations across the world. In this context, there are three possible scenarios of outcomes with trade-offs.

The first scenario: Ideally, decision-makers will fully embrace and adopt the agrobiodiversity model and implement it effectively across G20 countries. This will pave the way for enhanced agrobiodiversity practices, leading to long-term sustainability, but there may be short-term trade-offs in agricultural productivity. Diversifying farming systems and adopting new practices could initially lead to lower yields or increased labor requirements, impacting farmers' incomes and food availability in the short term. To mitigate such risks, farmers may require support through subsidies and schemes. Investing in agrobiodiversity initiatives may also lead to the diversion of resources away from other agricultural priorities, such as infrastructure development or input subsidies. Decision-makers must balance competing demands for limited resources and ensure that investments in agrobiodiversity are prioritized.

The second scenario: In the event of partial adoption of approaches, farmers with limited resources or access to information may struggle to adopt agrobiodiversity practices, leading to uneven outcomes and perpetuating disparities within and between communities. Insufficient support for agrobiodiversity initiatives may result in missed opportunities for innovation and productivity enhancement. Alternative farming practices, such as agroforestry or integrated pest management, offer potential benefits for soil health, water conservation, and biodiversity conservation but remain underutilized without supportive policies and incentives.

Dependency on external funding may pose risks. Reliance on limited funding sources, such as donor assistance or short-term grants, may undermine the long-term sustainability of agrobiodiversity initiatives. Without sustainable financing mechanisms and domestic investments, efforts to promote agrobiodiversity may be vulnerable to budget cuts, political instability, and shifting donor priorities.

The third scenario: In the event of no adoption, resistance from stakeholders with vested interests in conventional agricultural practices may hinder efforts to promote agrobiodiversity. Agro-industrial sectors, chemical input suppliers, and large-scale monoculture farmers may resist changes that challenge their established practices or threaten their economic interests.

Irrespective of the level of adoption of agrobiodiversity approaches, some challenges are common. In regions with limited extension services, educational resources, or digital infrastructure, farmers may lack the resources or support needed to implement agrobiodiversity effectively, hindering the adoption and scaling of innovative practices. Traditional farming communities may be reluctant to change established practices or adopt new techniques that challenge their cultural identity or livelihoods. Cultural norms and beliefs, as well as behavioral resistance, may pose barriers to the adoption of agrobiodiversity initiatives.

Considering these scenarios, navigating various trade-offs in promoting agrobiodiversity requires careful consideration of context-specific factors, stakeholder engagement, and adaptive management approaches across and within G20 countries. By examining different scenarios and understanding the challenges and opportunities they present, it is recommended that decision-makers develop more effective strategies for promoting agrobiodiversity and advancing sustainable agriculture and food systems.



Balancing competing demands, addressing systemic barriers, and fostering collaboration among diverse stakeholders is essential for achieving meaningful progress.



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