
AfDB Sector Brief: Agriculture and Nutrition



Human Capital, Youth
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This technical brief provides guidance to African Development Bank (AfDB) team members and decision-makers in designing nutrition smart agriculture projects by taking into account special considerations related to contextual factors and value chain linkages, which can ultimately increase impact on nutrition. Globally, there is variability in agricultural project design and this technical brief highlights key features and considerations that need to be considered on a case-by-case basis to design nutrition smart agriculture projects that directly respond to the priority needs of beneficiaries. It also complements the implementation of the AfDB Multi-Sectoral Nutrition Action Plan 2018-2025 and provides guidance for integrating nutrition smart actions into relevant pillars of Country Strategy Papers (CSPs) and Regional Integration Strategy Papers (RISPs) in order to catalyse nutrition smart investments to support a 40% stunting reduction in Africa by 2025.

This is one brief in a five-part series on the importance of multi-sectoral approaches to nutrition. To read the other briefs, contact nutrition@afdb.org.

Why is Agriculture Important for Nutrition?



The World Bank estimates that economic growth from agriculture is at least twice as effective in reducing poverty, and in turn, reducing hunger and undernutrition, as compared to growth in any other sector.¹ Agriculture

is a major source of income in Africa and growth in the agricultural sector has contributed strongly to economic growth over the past several decades. However, a research exercise which analysed over 7,000 agricultural programmes came up with the following unexpected conclusion: *the overwhelming majority of agricultural programmes were unable to prove their impact on reducing undernutrition.*² While they can increase crop yields, they often have not been able to provide evidence of their contribution to improving people's diets and nutritional status.

Although increasing staple crop yields can contribute to tackling food and nutrition insecurity, nutritional quality, diversity of crops and balanced diets are critical for improving nutrition outcomes.

Paradoxically, the highest prevalence of undernutrition is often in rural communities—the areas where most food is produced. This even includes areas with high crop yields, like in the Sikasso region in Mali, the Boucle du Mouhoun region in Burkina Faso and Nampula province in Mozambique. This phenomenon, which has diverse causes, demonstrates that the link between food production and good household nutrition in the same communities is not automatic. Agricultural programmes that focus on production of energy-rich or biofortified staple foods can be more effectively designed to reduce undernutrition by promoting crops that reduce vulnerability to droughts and extreme climate, increase yields or improve nutritional value. Likewise, programmes that promote sustained access to food through better storage conditions and improved processing and preservation have the potential to improve household nutrition.

As agricultural production grows and diversifies, households experience increased food security and better nutrition, which in turn leads to increases in human capital and productivity:

- Agricultural growth has shown a large and significant effect in reducing underweight and also leads to reductions in stunting in food-insecure settings;³
- Diversified agricultural production has the potential to improve access to more diverse and nutritious foods, a key component of meeting the Minimum Acceptable Diet for children

The AfDB, through its Feed Africa Strategy, will invest \$24 billion over the next 10 years in support of African agricultural transformation. As part of the Bank's High 5 Agenda and the objectives of the Feed Africa strategy, the Bank has elaborated a strategy for its support to the four specific goals of Comprehensive Africa Agriculture Development Programme (CAADP), namely:

1. Contribute to eliminating extreme poverty in Africa by 2025
2. End hunger and malnutrition in Africa by 2025
3. Make Africa a net food exporter
4. Move Africa to the top of export-oriented global value chains where it has comparative advantage

¹ Birch, et al. (2010). Why No Thought for Food? A UK Parliamentary Inquiry into Global Food Security. The All Party Parliamentary Group on Agriculture and Food for Development, London, UK.

² Webb, P. and Kennedy, E. (2014) Impacts of Agriculture on Nutrition, Food and Nutrition Bulletin, vol.35, no.1

³ Headey, D. (February 10-12, 2011). Turning Economic Growth into Nutrition-Sensitive Growth, Background paper for the conference "Leveraging Agriculture for Improving Nutrition and Health," IFPRI, New Delhi, India.

A preliminary set of agricultural commodities and agro-ecological zones identified as being initial lead areas for investment include:

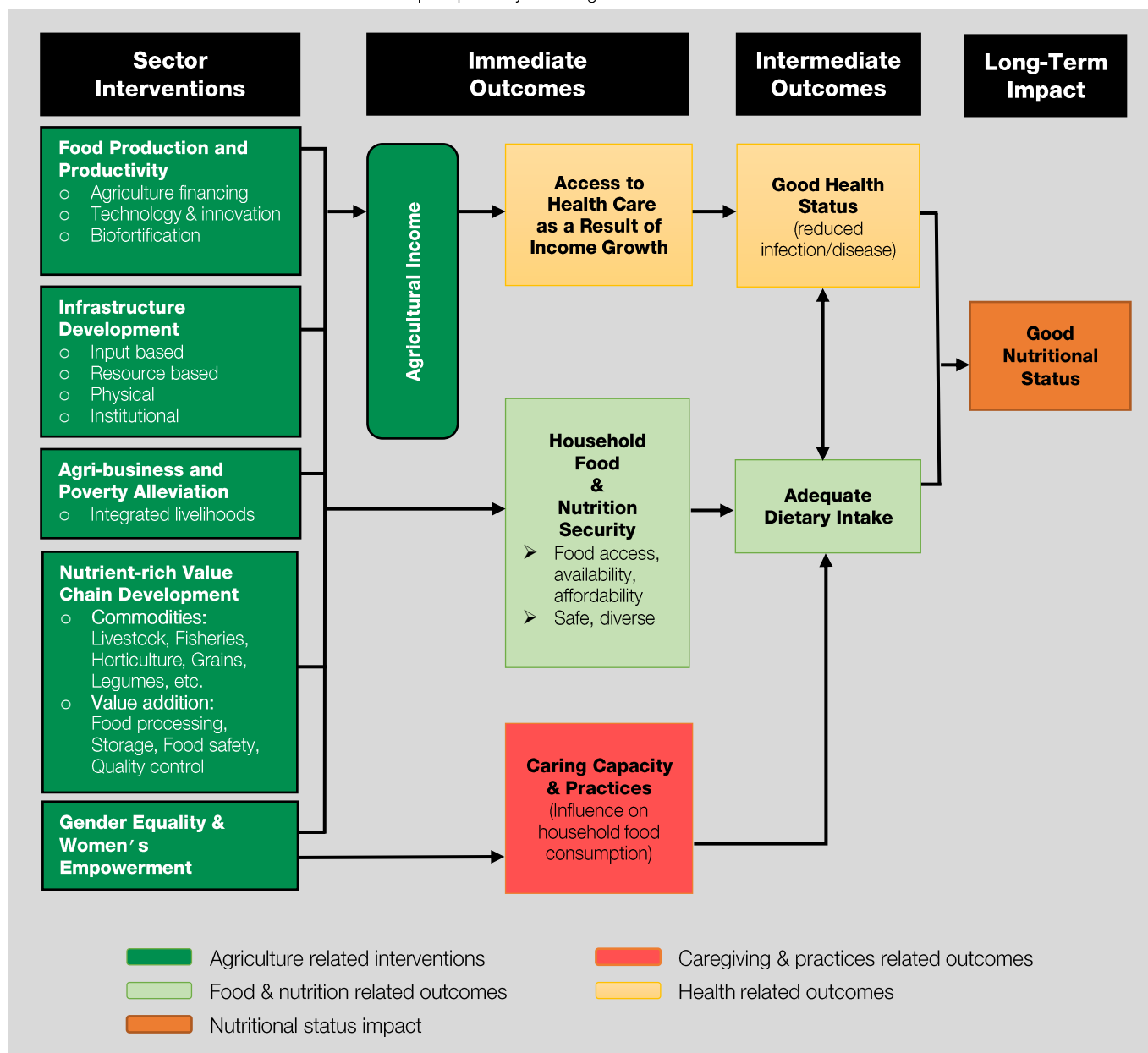
- Agricultural commodities:
 - Achieve self-sufficiency in key commodities (rice, wheat, fish, palm oil, horticulture, cassava)
 - Move up the value chain in key export orientated commodities (cocoa, coffee, cotton, cashew)
- Agro-ecological zones
 - Create a food secure Sahel (sorghum, millet, cowpea, livestock)
 - Realize the potential of the Guinea Savannah (maize, soybean, livestock and poultry).

Integrating nutrition into Feed Africa leverages investments to achieve a clear double objective of improving human nutritional status, while achieving the farm or agri-business level objective of increasing productivity, income and profits.

Impact Pathways from Agriculture to Nutrition

Several pathways have been identified showing how agricultural livelihoods and food systems may more effectively contribute to household food security and improved nutritional status. Agriculture can improve the quantity and quality of diets in households for subsistence farmers; reduce income poverty through produce sales and agricultural labour; empower women as income-earners, decision-makers, and primary childcare providers; decrease food price volatility; and increase government revenues that can be used to finance health care, education, and nutrition interventions. Interventions must address the relevant underlying and basic causes of malnutrition and should be designed considering pathways most relevant to the value chain. Evidence shows that by putting more focus on nutrition outcomes i.e. by including nutrition objectives at the outset, agricultural interventions can improve the capacity, productivity, and prospects of agricultural workers – and also contribute to reducing undernutrition.⁴

Figure 1
Impact pathways from agriculture to nutrition



Source: Created for AfDB Nutrition Smart Agriculture Projects (Nutrition International, 2019)

⁴ The World Bank, 2007. From Agriculture to Nutrition: Pathways, Synergies and Outcomes, 40196-GLB.

A: Food Production and Productivity

Household food production is important for improving the quantity and quality of diets in households of smallholder farmers. In general, however, it is not the primary objective of an agricultural livelihood to produce all the food a family needs; most poor rural families are net purchasers of food. However, for those with access to arable land, it is a combination of food produced for consumption, income, and local food availability and prices that determines the family's food security. Food production including kitchen and home gardens can affect the type, quantity and seasonality of food available in the household for consumption. At the same time, production may also influence the availability and prices of diverse food in local markets.

The decisions farmers make about crop and livestock production are affected by many factors, including potential market prices, relative costs and risks associated with each product, the assets and endowments of land the household possesses, and family needs and preferences. If preferred foods or varieties are not consistently available, affordable or conveniently accessible in markets, the most efficient way to obtain them may be to raise or grow them on the farm. Substituting a more nutritious variety of a crop already grown for consumption through biofortification (e.g. substituting yellow, vitamin A fortified maize for white maize or orange cassava for regular cassava) may be an easy way to improve nutrition as part of the overall set of livelihood decisions. Nutrition knowledge and social behaviour change communication (SBCC) are therefore essential to informing the range of decisions that farmers make about what they grow to consume, what they grow to sell, and what they decide to purchase with their income.

Processing and storage can affect the shelf life, safety and nutrient content of foods in positive or negative ways for nutrition and health. These actions may also have a positive or negative effect on income-earning potential (through value addition) based on the food market environment. For example, storage conditions can affect the level of mycotoxin contamination in maize and grains, and drying meats, fruits, vegetables, or fish or producing cheese can reduce losses and make nutritious foods available out of season for both home consumption and for sale in local markets.

B: Infrastructural Development

Agricultural infrastructure primarily includes the wide range of public services that facilitate production, procurement, processing, preservation and trade. Agricultural infrastructure can be grouped under the following broad categories:

- **Input-based infrastructure:** Seed, fertiliser, pesticides, farm equipment and machinery, etc.
- **Resource-based infrastructure:** Water/irrigation, farm power/energy
- **Physical infrastructure:** Road connectivity, transport, storage, processing, preservation, etc.
- **Institutional infrastructure:** Agricultural research, extension and education technology, information and communication services, financial services, marketing, etc.

Challenges arising from infrastructural development for smallholder farmers is not limited to on-farm infrastructure. Lack of access to facilities such as post-harvest, storage and processing facilities constitute barriers to entry into agricultural market. Off-farm infrastructure, such as roads, also serve as barriers facing smallholder farmers in terms of distribution and market access. Africa must therefore increase investments and improve resource mobilisation from both the public and private sectors to advance agricultural infrastructure, facilitate trade corridors and market access.⁵ The development of infrastructure and energy for agricultural growth and distribution of agricultural products where they are needed is another pathway to income growth and access to foods.

C: Agribusiness and Poverty Alleviation

Integrated livelihoods or increases in household income can improve food security, consumption and individual food intake.⁶ Agricultural workers can be either landowners, farmers, fishermen, herders or landless labourers/rural wage workers, and income for their households can be generated either through the sale of crops produced or wages earned by working in agriculture-oriented businesses. The keys to reducing poverty in rural areas are establishing and maintaining successful small farming businesses that ensure livelihoods. The improved year-round income and cash flow can then be used for immediate or future household needs, including food and non-food purchases to support a healthy diet and life.

⁵ Financing Africa's Infrastructure and Agriculture development: Inclusive growth for economic transformation. Report of the Expert group meeting, October 2017- UN HQ New York.

⁶ From Agriculture to Nutrition: Pathways, Synergies and Outcomes. The International Bank for Reconstruction and Development / The World Bank, 2007. Accessed at: <http://siteresources.worldbank.org/INTARD/825826-1111134598204/21608903/January2008Final.pdf>

The agricultural income pathway assumes that nutritious, diverse foods are available and affordable in local markets. Appropriate inputs to grow these diverse foods must also be available so that local production can meet demand. Additionally, market and transportation systems must enable year-round and/or seasonal supplies based on consumer preferences and purchasing power. Local supply and demand may also be influenced not only by market prices but also by social and behaviour change communication, nutrition knowledge, and social marketing, which may help drive consumer preferences. At the same time, household investments in health, including potable water sources and toilets, preventive care and other necessities are crucial to supporting good nutrition, especially for women and young children. All rural farm households must balance their spending decisions between farm production and marketing investments and the immediate purchases of food, health and care necessities.

D: Promoting Gender Equality and Women's Empowerment

Women's empowerment incorporates multiple aspects, including the decision-making power related to income, time, labour, assets, and knowledge or preferences of female community members. Studies have found that women's discretionary income has a greater impact on child nutrition and food security than that of men. When women have more control over household resources, families are healthier, better educated and have increased access to more nutritious foods.⁷ Often, the best way for women to influence how household income is spent is by earning their own income. For women in rural areas, an agriculture-related livelihood is the most common way a family makes a living. Women's decision-making also affects what is produced on the farm, and women's control of income and assets can affect productivity based on their spending decisions and on the social networks and cultural norms that influence those decisions. Training female and male farmers in farm management and business skills can optimise the income earned with the available time, labour, assets and capital.

Agricultural development interventions can strongly affect women's use of time as well as their labour burden. Women are typically responsible for a wide range of household and agricultural tasks, including child and infant care and feeding, as well as their own self-care. Activities that influence the amount of time or labour women spend on agriculture-related tasks can affect their own health and energy expenditure, and in turn, their capacity to feed and care for infants, young children and themselves. When a woman's work-related energy expenditure (i.e. workload) exceeds their nutrient intake, their nutritional status is compromised. Therefore, to improve nutrition in households supported by agricultural livelihoods, it is vital that farming business decisions consider how women are involved in agriculture activities. For example, if agriculture development activities strive to promote the production of various nutritious foods with high market value to help increase women's income, they must be designed and monitored to also ensure they are not contributing to women's time and labour burdens.

E: Nutrient-rich Value Chain Development

A commodity is defined as nutrient-rich if it meets any of the following criteria: (a) is biofortified; (b) is a legume, nut, or specific seeds (such as sesame, sunflower, pumpkin seeds, wheat germ, or sprouted legume seeds); (c) is an animal-sourced food, including dairy products (milk, yogurt, cheese), fish, eggs, organ meats, meat, flesh foods, etc.; (d) is a dark yellow or orange-fleshed root or tuber; or (e) is a fruit or vegetable that meets the threshold for being a "high source" of one or more micronutrients on a per 100 calorie and per 100 gram basis.

In addition to having a potential to improve nutrition outcomes, **greater agricultural productivity and value chain development**⁸ lead to additional activities and jobs, and increases income leading to economic growth. In more prosperous transforming and urbanised countries, the industries and services linked to agricultural value chains often account for over 30% of gross domestic product (GDP).⁹ Economic returns in target value chains can be increased through improved quality; reduced costs and post-harvest loss; and increased output, sales and profits along the value chain, leading to improved income and employment along the entire value chain.

The issue of poor storage leading to higher occurrence of aflatoxins will need to be addressed by improving processing, storage and preservation of food along the value chain development. Poor storage can contribute to higher occurrence of aflatoxins including in more temperate regions.¹⁰ Dietary aflatoxin exposure has been linked with impaired growth in young children.¹¹ National estimates of dietary exposure to aflatoxins indicate differences between developed and developing countries. In developed countries, mean aflatoxin dietary exposures are generally less than 1 ng/kg body weight (bw) per day, whereas estimates for some sub-Saharan African countries exceed 100 ng/kg bw per day.¹⁰

⁷ Committee on World Food Security (CWFS), 2011. Policy Roundtable: Gender, Food Security and Nutrition, 37th Session, Rome, Italy.

⁸ A **value chain** in agriculture identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product. A value chain can be a vertical linking or a network between various independent business organisations and can involve processing, packaging, storage, transport and distribution.

⁹ Gender and Rural Employment Policy Brief #4, 2010: Agricultural value chain development: Threat or opportunity for women's employment?

¹⁰ World Health Organization. Food Safety Digest. Department of Food Safety and Zoonoses. February 2018. REF. No.: WHO/NHM/FOS/RAM/18.1

¹¹ Gong et. al. Dietary aflatoxin exposure and impaired growth in young children from Benin and Togo: cross sectional study. British Medical Journal. BMJ Vol. 325; 6 July 2002

Priority Actions for Nutrition Smart Agriculture Programmes

A review of 23 evaluations of agricultural programmes that aimed to improve child nutrition status found promising results, including: increase production of promoted food items; uptake of the promoted diet changes; increased vitamin A intake; nutritional impact and consumer acceptance of foods bred for high-nutrient content; and improved nutritional impact on short-term indicators of hunger like wasting and underweight.¹²

1. **Incorporate explicit nutrition objectives and indicators into project design at the outset**, showing a pathway for how agriculture will contribute to improved nutrition, especially for small-scale farmers and vulnerable groups, such as children under five and pregnant and lactating women. This will enhance the positive impact of agricultural interventions on nutrition and help track and mitigate potential harms. Evidence shows that agricultural interventions can better contribute to reducing undernutrition by putting more focus on nutrition outcomes and implementing impact assessments to develop an evidence base for the positive impact of producing foods high in protein, essential fats, and micronutrients.
2. **Assess the context at the local level to inform the design of appropriate activities that address the types and causes of malnutrition.** Context assessment can include potential food resources, agro-ecology, seasonality of production and income, access to productive resources such as land, market opportunities and infrastructure, gender dynamics and roles, opportunities for collaboration with other sectors or programmes and local priorities.
3. **Target the vulnerable and improve equity**, particularly for pregnant and lactating women, children under the age of five years and adolescent girls. Other vulnerable population groups include smallholder farmers, the landless, youth and the unemployed. Equity can be improved through participation, access to resources and decent employment.
4. **Facilitate production diversification and increase production of nutrient-dense crops and small-scale livestock when is economically feasible**—for example, horticultural products, legumes, livestock and fish on a small-scale, as well as under-utilised crops and biofortified crops. Diversified production systems are important to vulnerable producers to facilitate resilience to climate and price shocks, more diverse food consumption, reduction of seasonal food and income fluctuations, and greater and more gender-equitable income generation.
5. **Collaborate and coordinate with other sectors** (e.g. health, environment, social protection, labour, water and sanitation, education and energy) and programmes, through joint strategies with common goals to concurrently address the multiple underlying causes of malnutrition. For instance, in humanitarian emergencies, an AfDB project—Post Cyclone IDAI and KENNETH Emergency Recovery and Resilience Programme for Mozambique, Malawi and Zimbabwe (PCIREP) 2019—adopted a multi-sectoral intervention approach to enhance agriculture productivity and food security, promote hygiene campaigns to prevent occurrence and spread of diseases, and provide psycho-social support particularly trauma counselling and care to rebuild social structures.
6. **Improve processing, storage and preservation of food** to retain nutritional value, shelf-life and food safety; to reduce seasonality of food insecurity and post-harvest losses; and to make healthy foods convenient to prepare. Invest in nutritious food value chains and create markets for smallholder farmers to promote their production of nutritious foods.
7. **Empower women** by promoting programmes that facilitate equitable access to required resources such as access to credit, productive assets, and information, time/labour saving technologies, extension services and markets. Empower women as agents of change and promote gender equity and an equitable division of labour. Introduce time- and labour-saving farming technologies—including energy and water services.
8. **Incorporate nutrition promotion and education around food and sustainable food systems** that builds on existing local knowledge, attitudes and practices. Nutrition knowledge can enhance the impact of production and income in rural households—especially for women and young children—and can increase demand for nutritious foods in the general population.
9. **Encourage using income for better diets, health and hygiene.** Improve household budgeting skills to afford the cost of nutritious diets. Stress the importance of investing in diverse foods, proper infant and child feeding, caregiving and health.
10. **Ensure that efforts to improve dietary practices** become a standard part of food security-oriented agricultural programmes.

¹² Masset, E, et al. (2011). A systematic review of agricultural interventions that aim to improve nutritional status of children, EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Case Study of AfDB's Nutrition Smart Agriculture Project



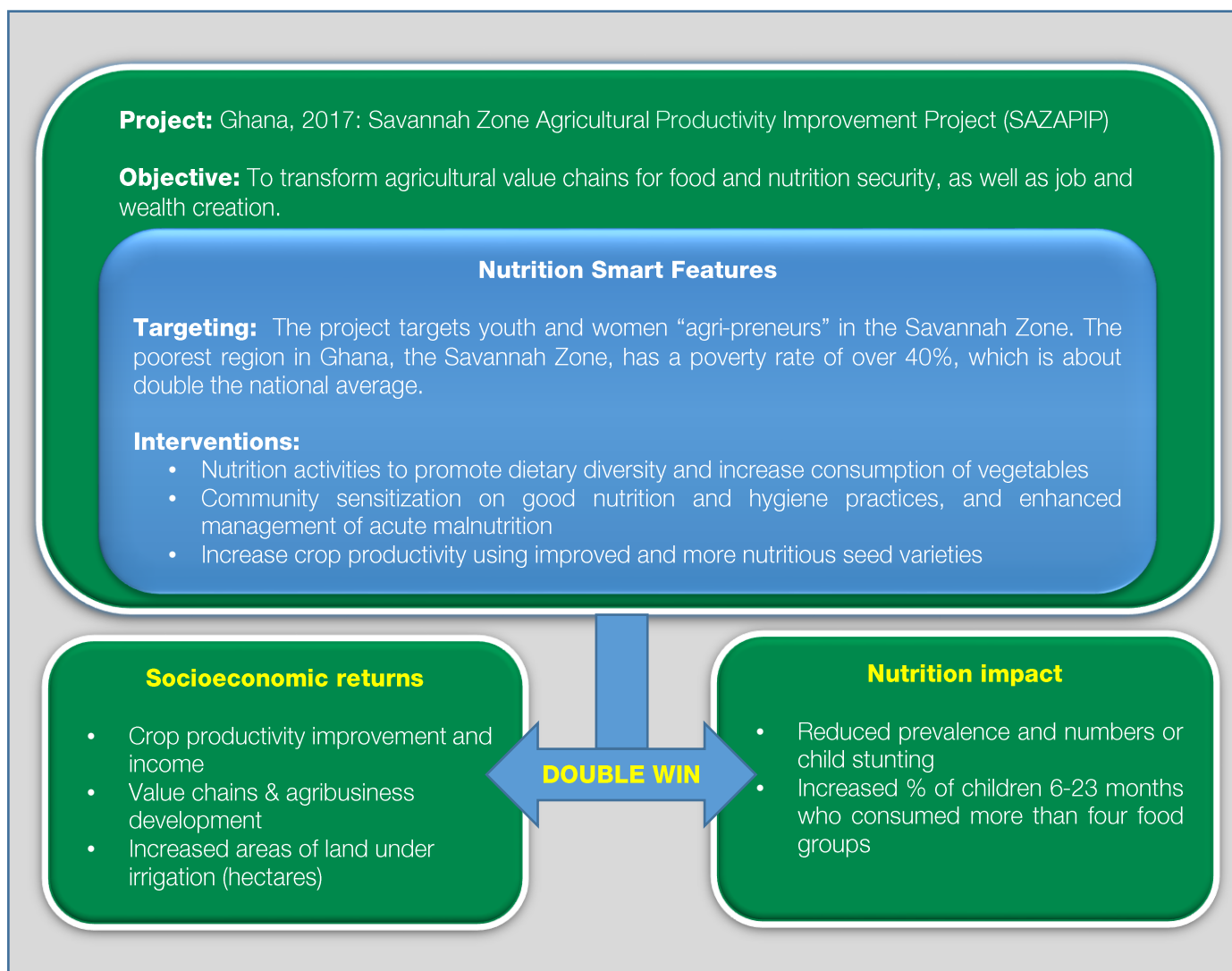
Ghana, 2017: Savannah Zone Agricultural Productivity Improvement Project (SAZAPIP)

In Ghana, a significant regional disparities exists with respect to nutrition and food security. While the national prevalence of stunting is 19%, the rate in the country's northern region is as high as 33%. Variation in stunting levels is associated with maternal educational and economic status as evidenced by only 16% of children whose mothers have secondary education are stunted, compared to 26% among their counterparts whose mothers had no formal education.

Similarly, only 9% of children in the highest wealth quintile are stunted compared to 25% of those in the lowest wealth quintile. Anaemia, particularly in children under five years constitute a significant public health problem. Despite decline in the rates of childhood anaemia from 78% in 2008 to 66% in 2014, it still lies far above the 40% WHO threshold for a severe public health concern.

Food insecurity is a major contributing factor to the poor nutritional status of the population in Ghana's northern regions with 16% the households in the most affected areas, which include the Upper East, Upper West, Northern, Brong Ahafo, and Volta, considered food insecure. Food insecurity is linked to the inability of households to produce enough staples to meet their food needs, due to poor soil quality, unfavourable weather conditions, constrained access to inputs and limited financial resources to expand production.

SAZAPIP aims to transform agricultural value chains for food and nutrition security, as well as job and wealth creation in the Northern Savannah Zone of Ghana. The project will increase farmers' food and nutrition security and incomes through increased agricultural productivity and diversification, as well as enhance the creation and strengthening of agribusinesses in a sustainable manner to increase incomes of actors along selected value chains.



Monitoring and Evaluation Indicators

Examples of Core Sector Indicators:

- Percentage (%) increase in production of (selected) nutrient rich/biofortified foods
- Proportion of the population that is likely to be reached with biofortified foods
- Percentage (%) of women, 15-49 years of age, who consume at least five out of 10 defined food groups (Minimum Dietary Diversity for Women)
- Percentage (%) of children, 6-23 months of age, who consume at least four or more food groups (Minimum Dietary Diversity for young children)
- Number (#) of project beneficiaries who are women (including adolescent girls) (Gender Equality)

Examples of Custom Project Indicators:

- Percentage (%) of staple crop production that is biofortified
- Number (#) of individuals/households practicing homestead food production models
- Number (#) of individuals (especially women) with access to time and labour-saving agricultural technologies
- Number (#) of individuals trained on nutrition through farming extension methodologies
- Percentage (%) increase of nutrition focused small- and medium-sized enterprises (SME)

Note: More details on indicators can be found in **FAO 2016: Compendium of Indicators for Nutrition Sensitive Agriculture** available at the AfDB Nutrition Learning Resources Platform.

Collaborating Partners

Collaborating partners will be country specific but usually include:

- Ministries of Agriculture, Livestock, Fisheries, Forestry, Rural Development, Water, Health, and Education (for school feeding)
- Relevant United Nations agencies namely World Food Programme (WFP), Food and Agricultural Organization of the United Nations (FAO), International Fund for Agricultural Development (IFAD)
- Research centres such as National Agricultural Research Institutes and CGIAR centres
- Civil Society Organisations (CSO)
- Non-governmental organisations (NGO) and development partners working in the areas of agriculture and rural development

Suggested Resources

1. African Development Bank. (2016). Feed Africa: Strategy for agricultural transformation in Africa 2016-2025. (Rep.). doi:https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed_Africa_-_Strategy_for_Agricultural_Transformation_in_Africa_2016-2025.pdf
2. Food and Agriculture Organization of the United Nations (FAO). (2015). Designing Nutrition Sensitive Agriculture Investments: Checklist and guidance for programme formulation. Doi: <http://www.fao.org/3/a-i5107e.pdf>
3. Food and Agriculture Organization of the United Nations (FAO). (2016). Compendium of indicators for nutrition-sensitive agriculture (Rep.). Rome. [doughty://www.fao.org/3/a-i6275e.pdf](http://www.fao.org/3/a-i6275e.pdf)
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