



The Movement for
**SCHOOL-BASED
AGRICULTURAL EDUCATION**

Trent McKnight

Principal Author

2021

Empower Youth, Transform Agriculture:

An Introductory Guide to
School-Based Agricultural Education
in Sub-Saharan Africa



Sponsored by **The Movement for School Based Agricultural Education**

Funded by **AgriCorps, Inc.**





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AgriCorps creates an enabling environment and builds capacity for school-based agricultural education systems in developing countries in order to reduce generational cycles of hunger and poverty. These systems transform local communities by diffusing agricultural innovations to farmers through in-school youth, as early adopters.

For further information about AgriCorps or The Movement for School-Based Agricultural Education, please write to Humanitas Global at 1624 I Street, NW, Suite 1100, Washington, DC 20006, or visit www.agricorps.org or www.sbae.org.

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Acronyms

ADEA	Association for the Development of Education in Africa
AfDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
CADDP	Comprehensive Africa Agriculture Development Programme
FAO	Food and Agriculture Organization of the UN
FFA	Future Farmers of America
FFJ	Future Farmers of Japan
FFK	Future Farmers of Korea
GDP	Gross domestic product
GES	Ghana Education Service
HA	Hectare
IFAD	International Fund for Agricultural Development
LMIC	Low-middle income country
M&E	Monitoring and evaluation
MOFA	Ministry of Food and Agriculture (Ghana)
MoU	Memorandum of Understanding
MT	Metric tons
NAIP	National Agricultural Investment Plan
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
PTA	Parent Teacher Association
PYD	Positive youth development
R&D	Research and development
SBAE	School-based agricultural education
SBAE-CORE	School-Based Agricultural Education Council on Research and Evidence
SSA	Sub-Saharan Africa
STEM	Science, technology, engineering and math
TAAT	Technologies for African Agricultural Transformation
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

Acknowledgments

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AgriCorps wishes to thank the members of the Review Committee who participated in the development of this guide.

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Additionally, a special thanks to the following individuals for their significant feedback and contributions: *Edith Kachale-Banda, Mary Crave, Linda “Jo” Turner, Maud Seghers, Doug Kueker, Austin Peterson, John Romo, Ellen Lupkes, Gena Perry, Dancey Creel, Blaze Currie, Jack Bobo, Kim Byeong-ho, Jaehyun Ahn, Felix Kwami Yeboah, G. Umaru Sheriff, Ed Price, Gary Briers, Glen Shinn, Marshall Baker, Jack Elliot, Tobin Redwine, Anne MacDonald, Brian Hogue, Jimmy Lee and Chris Udry.*

AgriCorps Fellows

This guide is based on the experiences, photography and grit of every Returned AgriCorps Fellow since 2012: *Bob Whitney, Rudy Espinoza, Brennan Costello, Kallie Hall, Joenelle Futrell, Seth Pratt, Kenny Quick, Jason Troendle, John Romo, Allison Hoover, Cassella Slater, Courtney Angel, Dustin Homan, Leah Sandler, Melissa Tabke, Nick Traini, Haley Clement Traini, Gena Perry, Cody Jones, Kelsey Knight, Hanna McCollom, Matthew Cole, Kelsey Barnes, Sara Tweeten, Paige Fuselier, Dianne Devos, Lyndee Lum, Dylan Lilley, Renee Massa, Chandler Mulvaney, Emma Cannon, Jordan Byrd, Kaylee Bohn, Clayton Carley, Erik Jorgensen, Mark Rippke, Peter Cohen, Nathan Glenn, Anna Glenn, Carrie Stephens, Eli Huggis, Ellen Lupkes, Hope Sorrells, Merle Mullet, Ryan Tomlin, Megan Harper, Sayvanna Sfabian, Tiffany Thompson, Mitch Rozeboom, Joel Reddick, Annie Palmer, Justin Monroe, Conor McCabe, Connor Lilles, Amy Greenburg and Kelse Brown.*

All pictures were captured by the aforementioned Contributors and AgriCorps Fellows between 2012 and 2020.

And of course, none of this would be possible without the tremendous editing skills of Nancy Hart and the design skills of Adnan Sabic.

Thank you!

Executive Summary

Empower Youth, Transform Agriculture is an introductory guide meant to familiarize a new and expanded audience to school-based agricultural education (SBAE), a practical, cost-effective educational system that has enormous potential for involving youth as early adopters of agricultural innovations – empowering them to be change agents for the diffusion of those innovations within their rural communities. SBAE is not a new concept. It has been serving agricultural educators and students around the world for more than a century. What is new is its potential to support youth and rural communities of sub-Saharan Africa at a time when a youth population bulge poses both a unique challenge and opportunity to the agricultural, economic and political future of the continent.

Sub-Saharan Africa (SSA) is home to 1 billion people – 60 percent of whom are smallholder farmers. More than half of the region is under age 18, and by 2050, the region's population is expected to double, adding stress to an already vulnerable region through increased food insecurity, economic instability and social unrest. SBAE offers to be part of the solution for agricultural transformation.

To set the context, Section 1 presents an overview of agriculture policy initiatives currently active in SSA and looks at the strengths, weaknesses, opportunities and threats faced by those in the region's agricultural sector. It concludes with a summary of the history of SBAE, explaining its focus on the practical aspects of introducing and diffusing agricultural innovations. The experiential learning method developed through SBAE in the early twentieth century in the United States contributed to the establishment of Future Farmers and 4-H Clubs, which continue to support millions of students around the world. SBAE still offers a blueprint for agricultural development that empowers students to transform their agricultural experiences into knowledge about the real world, leading to behavioral change for an entire community.



Section 2 takes an in-depth look at the SBAE system built around the four components of the agricultural education model: classroom instruction, school demonstration farm, home entrepreneurship projects and leadership development. A graphic illustration (Figure 1) of the system shows the inputs and outputs necessary to achieve the short-term (youth) and long-term (community transformation) outcomes of SBAE. Owing to a collaboration of institutions, pedagogy and agricultural innovations are imparted to agriculture teachers through a series of trainings. Teachers diffuse these ideas to students, who practice them on school and home farms. Through the framework of an agricultural student organization, such as 4-H or Young Farmer Organizations, SBAE gives students the opportunity to build leadership, entrepreneurship and core life skills. As parents and other farmers in the community witness the confidence, increased agricultural production and income generated as youth employ their newly learned innovations, they begin to ask questions and slowly adopt the same innovations until a tipping point of diffusion occurs, leading to community transformation. Section 2 examines each of these steps – institutions, agriculture teacher training, agricultural education model, youth outcomes and community transformation – individually and in detail.

SBAE encompasses the theoretical foundations of four different bodies of knowledge – diffusion of innovations, positive youth development (PYD), experiential learning and behavioral economics. Section 3 examines two of these theories in greater detail – experiential learning and behavioral economics. Via experiential learning pedagogy, SBAE initiates a natural, community-based learning environment. SBAE provides and facilitates concrete agricultural experiences and challenges on a school demonstration farm or home entrepreneurship project to make agricultural education relevant.

Section 3 also discusses the behavioral economics behind youth as change agents for their families and rural communities. Being more easily influenced than adults and not blinded by previous experience, young people are an ideal entry point for agricultural innovations into a rural community. Indeed, their inexperience situates them in a unique position to frame and introduce agricultural innovations to adults. Equipped with the science-based knowledge from school, when youth outperform their elders on the farm through a home project, the elders are curious to know why. Witnessing the innovations applied by their “inexperienced” juniors, the adults feel confident to replicate and adopt similar measures.

Looking ahead to Advance SBAE

Section 4 concludes the guide by introducing the Movement to Advance SBAE, which was launched in August 2020, to enable integration and adoption of SBAE across SSA through diverse and existing pathways that reach school-based youth. As the Movement grows, it will bring together a diverse set of partners to generate and disseminate research-based evidence, build awareness at local, national and global levels, and transform policy, program and investment landscapes – all of which will contribute to enable the successful uptake of SBAE across SSA. It closes by inviting interested organizations to join the Movement to Advance SBAE, and provides “10 Actionable Steps” to any organization working within a local country’s context.

Success stories from the field

Sprinkled throughout the text are short vignettes of success observed in the field and personal stories of students, parents, teachers and government officials who participated when SBAE was successfully piloted in their communities. Stories are based on field research conducted by the author in Ghana and Liberia in 2018-19 after the five-year pilot phase.

The Agriculture Creed of 4-H Liberia As adapted from E.M. Tiffany

I believe in the future of agriculture, with a faith born not of words but of deeds—achievements won by the present and past generations of agriculturists; in the promise of better days through better ways, even as the better things we now enjoy have come to us from the struggles of former years.

I believe that to live and work on a good farm, or to be engaged in other agricultural pursuits, is pleasant as well as challenging; for I know the joys and discomforts of agricultural life and hold an inborn fondness for those associations which, even in hours of discouragement, I cannot deny.

I believe in leadership from ourselves and respect from others. I believe in my own ability to work efficiently and think clearly, with such knowledge and skill as I can secure, and in the ability of progressive agriculturists to serve our own and the public interest in producing and marketing the product of our toil.

I believe in less dependence on begging and more power in bargaining; in the life abundant and enough honest wealth to help make it so—for others as well as myself; in less need for charity and more of it when needed; in being happy myself and working fairly with those whose happiness depends upon me.

I believe that Liberian agriculture can and will hold true to the best traditions of our national life, and that I can exert an influence in my home and community, which will stand solid for my part in that inspiring task.





Section 1. Introduction

1.A Overview

Regardless of politics, geography, gender, religion or culture, humankind has a universal, unifying factor: *every person must eat*. Consistent access to safe and nutritious food is a physical and moral imperative; it is also the foundation of a region's economic growth and development. Yet global food systems are fragile, and a breakdown anywhere along the food value chain can lead to hunger, instability, conflict, migration and environmental degradation. From biotechnology to information technology, the private and public sectors have developed innovations that increase food production with less labor and fewer resources. While governments and multilateral institutions have developed policy agendas to address these issues, many solutions fail to reach the most important level of all – the farmer.

Sub-Saharan Africa (SSA) is home to almost 1 billion people – approximately 13 percent of the world's population (OECD/FAO, 2016). More than half of the region is under age 18, and by 2050, the region's population is expected to double (Yeboah, 2018). Smallholder farmers constitute more than 60 percent of the region's population, piecemealing livelihoods from agriculture and other low-income jobs. Almost half of the farmers are women (OECD/FAO, 2016). With these trends, agriculture¹ offers a significant opportunity for impact on poverty reduction, gender equity, youth development and rural transformation. Agricultural innovations² that save time, make farm life more comfortable, improve productivity, reduce loss, enhance nutrition and preserve natural resources are critical to this process. Yet, innovations are only as good as their adoption rates.

Innovations often elicit feelings of uncertainty within any social system (Rogers, 2003). This is especially true from the reference point of a smallholder farmer. An effective way to frame the efficacy of agricultural innovations is to shift a farmer's reference point, or perspective, through empowering youth as early adopters and change agents. Young people are the ideal entry point into a rural community because they are more easily influenced than adults, especially within a school setting. This is not the standard school garden program often seen across the African continent. It is a twenty first century behavioral economics approach to an early twentieth century experiential learning model.

Developed more than 100 years ago, school-based agricultural education (SBAE) encompasses the theoretical foundations of four different bodies of knowledge – diffusion of innovations, experiential learning, positive youth development (PYD) and behavioral economics. It is a cost effective³, holistic system of delivering agricultural innovations within a local context, guided by an experiential learning model in non-dormitory, post-primary schools – namely, at junior and senior high levels. Regardless of their status or aspiration, SBAE improves the lot of everyone currently in agriculture – those who remain smallholding, those who transition into commercial agriculture and those who exit the sector altogether. By identifying youth as early adopters of agricultural innovations and empowering them to be change agents for the diffusion of those innovations, SBAE becomes an economic incubator for the entire rural community – amplifying existing agriculture and education initiatives.

¹ For this guide, the word agriculture is meant to encompass the entire agriculture and food (agrifood) value chain, including farming, agricultural sciences, agricultural economics, agribusiness, logistics, marketing, distribution and more.

² Everett Rogers (2003) defines innovation as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption.”

³ SBAE leverages existing capital and operational infrastructure: schools, teachers, research farms and extension agents. Based on six years of SBAE operations in Ghana and Liberia, total additional direct and indirect expenses would cost governments \$800 to \$1,600 per school, annually.

For SBAE to succeed, it needs champions within national governments, civil society, regional institutions, international development organizations, multilateral institutions and the private sector. This guide⁴ aims to support these groups to scale and build capacity for SBAE systems across SSA, while illustrating SBAE's rich history and underpinning theories.



⁴ This guide is made possible by AgriCorps, a US-based non-profit which creates an enabling environment and builds capacity for SBAE systems in developing countries. The system framework is based on six years of building capacity for SBAE in Ghana, Liberia, Ethiopia, and Nicaragua, along with the support of Africa and US-based partners at the National 4-H Council, National FFA Organization, 4-H Ghana and 4-H Liberia.

1.B Context

SBAE supports African regional priorities

The future of African young people lies in a more prosperous and inclusive Africa, and there is no other sector that has greater power to create growth than the agricultural sector.

Akin Adesina

President, African Development Bank

The African regional landscape prioritizes agricultural growth and job creation as a means of rural and structural transformation across Africa. Many of the strategies developed to meet these goals prioritize youth participation in gainful agricultural employment in both formal and informal sectors. The following initiatives set the stage for a movement to successfully scale SBAE across SSA.

CADDP. The Comprehensive Africa Agriculture Development Programme (CAADP), developed in 2003 by African Heads of State and Government, comprises 44 countries, to date. These countries have signed the CAADP Compact, which calls for allocating 10 percent of public expenditures to agriculture and seeks 6 percent growth in annual agricultural productivity. As the framework for action in agricultural transformation, CAADP focuses on the expansion of agricultural growth, improved infrastructure, expanded agricultural research and greater access to technologies through a market economy.

Malabo Declaration. In 2014, African Heads of State and Government adopted the Malabo Declaration on Accelerated Agriculture Growth and Transformation for Shared Prosperity and Improved Livelihoods. The Malabo Declaration recommitted to the principles of CAADP, but with specific targets in agricultural finance and agrifood job creation – including creating new job opportunities in agricultural value chains by 2025, with preferential entry for women and youth.

Agenda 2063. The African Union has set Agenda 2063 as its blueprint for transforming the continent. Central to the Agenda is a set of African aspirations, including a core vision focused on inclusive development that is people-driven, especially for women and youth. The Agenda foresees an inclusive development that eradicates poverty and transforms economies through improved education, modern agriculture and environmental resilience.

Feed Africa Strategy. The Feed Africa Strategy outlines additional programs through the African Development Bank's (AfDB's) \$24 billion investment in African agricultural transformation. The Strategy emphasizes the need for a new crop of young “agripreneurs”, which will require empowering and training youth to change the traditional view of agriculture while equipping them with the skills and financing to be successful. Additionally, the AfDB has launched the Technologies for African Agricultural Transformation (TAAT) initiative, designed to increase investment into agricultural research and dissemination of proven, Africa-tailored technologies ready for scale.

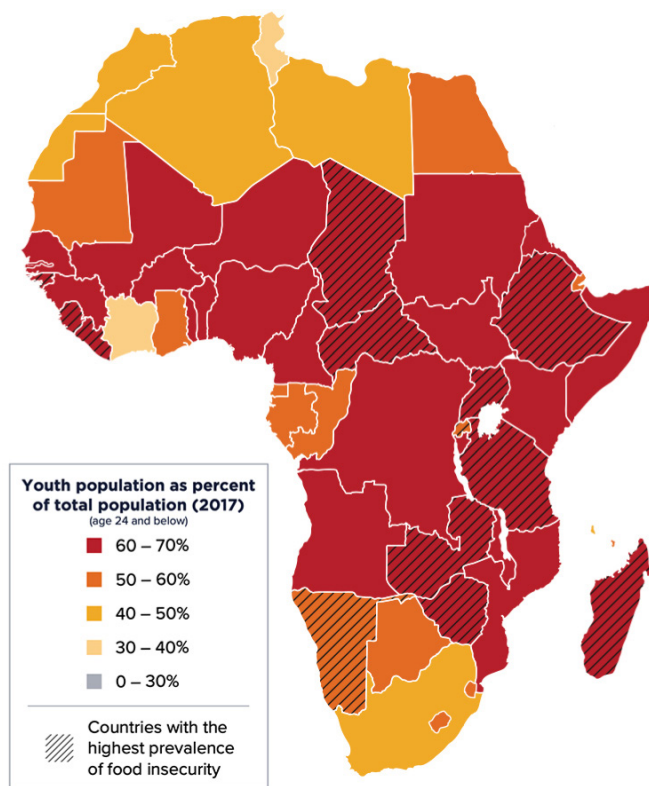
SBAE aligns well with these regional initiatives, but integrating them within national policy will require the buy-in of local governments, including the Ministries of Finance, Trade and Commerce. Their direct involvement will secure additional budget funds, which neither the Ministries of Agriculture nor Education often have. Together, these regional and national policymakers can use SBAE to transform SSA's demographic challenges into economic growth opportunities.

Empowering youth to achieve agricultural and rural transformation

Strengths & Weaknesses

Sub-Saharan Africa has the world's youngest population, with more than 60 percent of its 1 billion people under age 25. More than half of the region is under age 18, and by 2050, the region's population is expected to double (Yeboah, 2018). Without proper interventions, this rapid population growth will magnify the strains on an already fragile agriculture and food system.

Even before the COVID-19 health crisis, almost one in four persons living in SSA was considered undernourished. For three decades, food security had improved across SSA, but the trend reversed in 2015. By 2018, food insecurity had reached 239 million hungry mouths, with an even higher number of people experiencing moderate levels of undernourishment during a given year (FAO, IFAD, UNICEF, WFP and WHO, 2019).



Source: Yeboah, 2018

Figure 1. African countries with highest prevalence of youth and food insecurity

Agriculture is an essential sector in African economies. On average, it accounts for 15 percent of gross domestic product (GDP) across SSA (OECD/FAO, 2016) and a majority of the region's employment⁵ (Yeboah, 2018, p. 49). While the gross value of agricultural production in SSA, measured in constant US dollars, increased by 125 percent between 1990 and 2013, most of that increase was the result of land-area expansion rather than intensification or labor productivity (OECD/FAO, 2016, p. 62–64). This expansion has put tremendous stress on the local environment and natural resources, with rural populations continuing to grow, despite a trend towards urbanization.

Contrary to trends in other regions, the average age of farmers in SSA is much lower, due to an extremely high percentage of rural youth engaged in the sector (Yeboah, 2018). In Nigeria, for example, 90 percent of rural youth, ages 15 to 24, are employed in agriculture and dedicate 70 percent of a working day to household farms (IFAD, 2019, p. 74). Furthermore, an overwhelming majority of rural youth live in areas of high agricultural potential, making agriculture a realistic and necessary economic entry point.

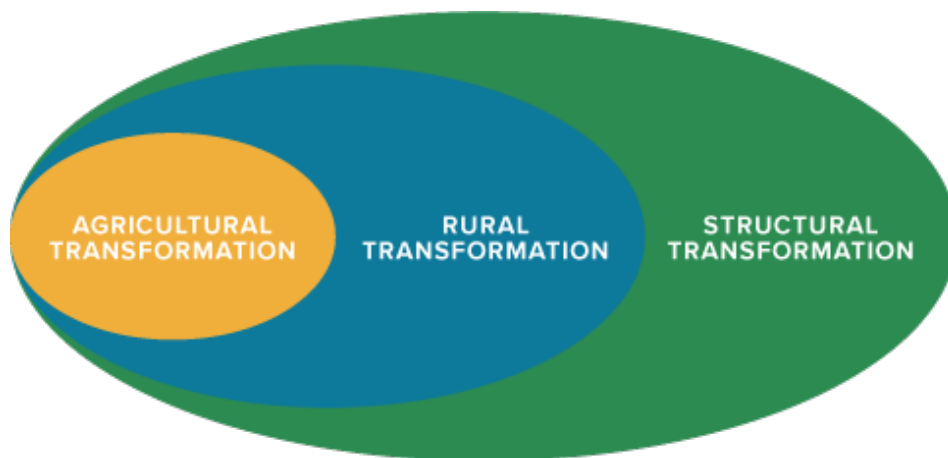


⁵ According to the World Bank, the definition of employment in developing countries “is broader than wage or salaried positions with an employer. Many individuals hold jobs that are better characterized as ‘activities that generate actual or imputed income, monetary or in-kind, formal or informal’” (Fox, 2018).

Opportunities

Agriculture is not only vital to Africa's current and future economic and food security demands, it also provides a first step to spur economic transformation and growth, especially through youth. As economies develop, productivity increases, living standards improve and poverty declines (Yeboah, 2018, p. 20). This process of economic development occurs through three causal and overlapping transformations.

- **Agricultural transformation** begins when farmers adopt improved agricultural innovations, increasing farm productivity. An increase in productivity creates agricultural surpluses, which allow farmers to transition from subsistence to commercial agriculture or exit agriculture altogether.
- **Rural transformation** begins when these agricultural surpluses increasingly link farmers to urban-markets. This process initiates, but also simultaneously overlays, a structural transformation.
- **Structural transformation** is the process of moving from farm to firm, or from rural, agrarian-household employment to urban, industrial-wage employment.



These transformations are closely linked to a demographic transition towards a younger population, known as the “youth bulge”. The youth bulge is generated when a high fertility rate combines with a decline in infant and child mortality, and creates rapid population growth (IFAD, 2019, p. 74).

The youth bulge, coupled with rural and structural transformation, can open a window of opportunity for rapid economic expansion, known as the first and second demographic dividends (IFAD, 2019).

- **A first demographic dividend** emerges through the productivity that increases when a young, working population greatly outnumbers an older, non-working population.
- **A second demographic dividend** can occur when the working population makes up a larger share of the total population, due to declining fertility rates, and then increases its savings for retirement (IFAD, 2019, p 147). If financial institutions have properly developed, as a result of a robust structural transformation, these savings will create higher investment levels and contribute to long-term, self-sustaining growth.

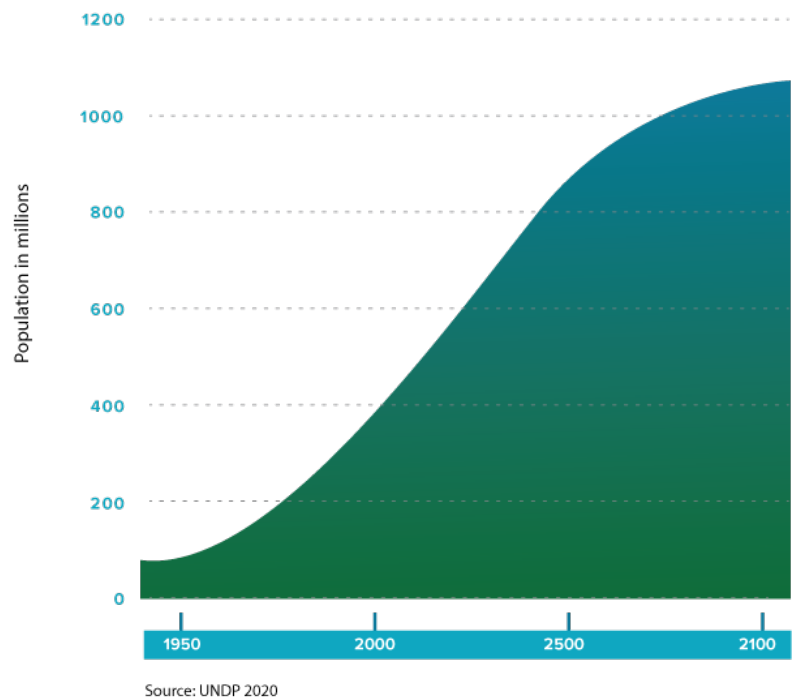


Figure 2. Global youth population trends (age 15-24)

Threats

Rural, agrarian youth have a built-in opportunity to accelerate and sustain economic transformation and development across the region. However, this process is far from given. Youth-centered agriculture policies and investments are critical to progress. If not appropriately managed, a rising youth population, coupled with a lack of economic opportunities and food insecurity, could lead to disillusionment and instability. The Chicago Council on Global Affairs 2018 report, *Youth for Growth* (Yeboah, p. 2–3), articulated the threats of exacerbated social disruption if this happens:

“Young people who lack compelling economic opportunities to lift themselves out of poverty are more likely to participate in extremism, crime, and social unrest, which can also be powerful drivers of both rural-urban and international migration. A transformed agricultural sector will increase economic opportunities for young people and help ameliorate the global migration crisis, minimize recruitment into terrorist and criminal organizations that threatens global and US national security, and promote food security and social stability in politically precarious regions.”

Not only can SBAE contribute to alleviating these enormous challenges, but current demographic opportunities can allow SBAE to successfully grow and scale. Sub-Saharan Africa has reached a stage of economic development in which SBAE has historically taken root and flourished in other parts of the world. Situated amid an agricultural and rural transformation, SBAE can both shape and be shaped by the forces of economic development.

1.C History

SBAE was developed in the early twentieth century when the United States was in the midst of an agricultural and rural transformation, education was compulsory through age 14 and the daily farm labor salary was around \$2 per day (Stimson, 1919, p. 454). Its success in the United States spawned replication around the world for much of the last century and, today, still offers a blueprint for international agricultural development.

In 1901, Rufus Stimson, the 32-year-old president of the Connecticut State College of Agriculture (now the University of Connecticut), began to notice the need to connect agricultural research to farmers. Stimson, a graduate of Harvard and Yale, a philosopher and a professor of English language and literature (Sorber, 2011, p. 285), seemed an unlikely agricultural prophet. Works of Socrates, Rousseau, Pestalozzi, Froebel and Herbart occupied a prominent place on his desk. Yet, he had also studied under William James (Lanthrop and Stimson, 1954, p. 585), whose pragmatist philosophy dictated that everything be viewed in terms of its practical use or success (James, 1943). Prior to Stimson, many agricultural researchers saw agricultural science as an end of itself; Stimson's philosophy led him to believe that agricultural sciences not applied to farms were wasteful. To rectify his belief, he needed a way to build scientific knowledge for practical agricultural research and deliver its findings to farmers. Stimson (1946) proposed a twofold idea:

- “(1) an adequately supported central source of trained men and experimental data, and
- (2) an inexpensive service system operating through local schools.”

In 1908, after seven years of building the capacity for agricultural training and experimental data at Connecticut's land grant college, Stimson resigned to become a high school agriculture teacher at Smith's Agriculture School in Massachusetts. This position enabled him to test his hypothesis that students' agricultural home projects could diffuse that research onto family farms. Before Stimson, vocational agricultural education in secondary schools had been limited to large boarding schools with capital-intensive school farms. Stimson found these schools to be impractical for education, relevance and scale. His solution was to create an agriculture department in every rural secondary school, allowing home projects to serve as the practical component in a student's agricultural education. In this way, students would work closely with parents, learn agricultural skills and earn money (Lanthrop and Stimson, 1954).

Students chose home projects that were important to their agricultural interests. Projects had to be productive rather than experimental – “learning and earning” was essential to the pedagogy. Because of its productive value, the student and teacher were able to engage the interests of adult farmers within the community (Stimson, 1919, p. 37–38). An editorial in *The Outlook* magazine, published in 1917, called SBAE a great unifier that “brings the school and the home together; the teacher and the parents together; education and life together” (Abbot, 1917, p. 473–475).



Early American example illustrates diffusion of innovation...

Philosopher, educator, agriculturalist and innovator, Rufus Stimson regularly hosted visitors from around the country and world. During one such visit, Stimson (1946, p. 47) noted the holistic impact of SBAE observed by William T. McCoy, the Education Commissioner of South Australia:

“On one farm as we were hurrying with a boy to see his project, the boy’s father came to the barn door and called out to Mr. Glavin [the agriculture teacher], asking if he might see him before we left the farm. After seeing a fine project and excellent records, we stood chatting with the boy and his mother. When the boy’s father and Mr. Glavin finally joined us, Commissioner McCoy said to the father, ‘It looks to me as if fathers were going to agriculture school, too.’ ‘Not only the fathers,’ the boy replied, ‘but the neighbors,’ and he pointed down the road where a neighbor was doing exactly what Mr. Glavin was teaching the boy to do on a like project. The neighbor had failed the year before by other methods.”



Under Stimson’s influence, the Smith-Hughes National Vocational Education Act of 1917 required agriculture instructors to supervise students’ home agriculture projects to be eligible for federal funds. With Congressional support, SBAE rapidly scaled across the United States. By 1928, this movement had become the Future Farmers of America (FFA), created to provide confidence, leadership and competitive opportunities for students of SBAE across the country.

Stimson was not the only influence supporting the agricultural education of boys and girls. Prior to SBAE becoming federalized, Corn Clubs and Tomato Clubs had engaged rural youth in agricultural transformation across the US. Corn Clubs were local organizations of boys who each cultivated 1 acre of corn, generally on his father’s farm, and were advised by local agriculture extension agents or teachers (Uricchio, Moore and Coley, 2013). The principal emphasis of these clubs was to engage youth in diffusing agricultural techniques from agriculture experiment stations to farmers. Tomato Clubs focused on girls and food preservation, but had no technological goals. Rather, they were meant to instill self-confidence in girls and focused on the role of women in the home and community.

By 1911, these boys’ and girls’ clubs had a combined national emblem – a four-leaf clover with an “H” on each leaf representing “Head, Heart, Hands and Health.” In 1914, 4-H Clubs found a permanent home and vehicle to scale: The United States Department of Agriculture’s (USDA’s) Cooperative Extension Service (Wessel and Wessel, 1982).

While 4-H and FFA reach several million students in the United States each year, the scale and growth of SBAE have been global. Prior to World War II, similar programs emerged in places such as Canada, England, Australia, South Africa, Scandinavia and Eastern Europe. In post-war Japan, SBAE and the Future Farmers of Japan (FFJ) were established during reconstruction; similar efforts were made in post-colonial Korea. In subsequent years, the United States Agency for International Development (USAID), the US Peace Corps and various European aid agencies expanded SBAE programs around the world, often using former 4-H members, FFA members or agriculture instructors to lead the efforts. Programs were established across Latin America, South Asia, and East and West Africa. In the 1950s, programs took root in Kenya, Ethiopia and Liberia (Stimson, 1946; Wessel and Wessel, 1982; Connors, 2013).

South Korea capitalized on demographic dividend with SBAE...

The Republic of Korea was particularly successful in capitalizing on its demographic dividend, an event brought about by increased income coupled with rapidly lowering fertility rates. This demographic dividend transitioned an agriculture-based economy to technology-based while also transforming it from aid recipient to aid donor. The transformation began in the 1950s and 1960s, with the introduction of public policies that called for investing in reproductive health, infrastructure and trade, and attracting foreign investment. Education also played a significant role by shifting to a production-oriented pedagogy focused on knowledge and skills needed for economic development (IFAD, 2019). In rural Korea, agricultural youth development and SBAE were strategically critical.

As part of the plan, the Ministry Education, Ministry of Agriculture and Forestry, and Rural Development Administration organized vocational agriculture high schools, the Future Farmers of Korea (FFK) and 4-H Clubs. By 1965, 4-H had enrolled 720,000 youth in 28,000 clubs. Membership peaked in 1986 with 1 million members but began a gradual decline due to aging in rural communities, a decrease in rural population, urbanization and industrialization (Institute of Agriculture, 1959; Kim, *et al.*, 2011; Yang and Choi, 2001).

In her remarks at the closing session of the 2014 Global 4-H Summit in Seoul, President Park Geun-hye attributed the “economic and democratic development of Korea” to the 4-H and Future Farmer movement in rural areas that had begun in the 1950s (Park, 2014).





Section 2. School-Based Agricultural Education System

2.A Introduction to the System

“If SBAE can extend to all schools, the students will learn better practices, they will help their parents at home, and we can kick poverty and hunger. Everyone will be sustainable.”

Daniel Mollay

4-H Liberia field officer

School-based agricultural education (SBAE) encompasses the theoretical foundations of four different bodies of knowledge – diffusion of innovations, experiential learning, positive youth development (PYD) and behavioral economics. Drawing from these disciplines empowers SBAE to implement cost-effective change as it works towards two core objectives:

- contribute to the academic, vocational and life skills development of youth through experiential learning methods;
- improve rural livelihoods by transferring skills and agricultural innovations into the home and community through schools.

SBAE also leverages existing agricultural and education resources: schools, teachers, research farms and extension agents. This makes it a cost-effective systems approach to meeting the current challenges of food security and youth population growth while also setting the stage for long-term economic development in sub-Saharan Africa (SSA).

SBAE follows Everett Rogers' (2003) diffusion of innovations continuum.⁶ Institutions develop innovations – curriculum, pedagogy, agricultural technologies and methodologies. Field officers, extension agents and teachers become change agents, trained to deliver these innovations into rural, non-dormitory junior high schools through the four-component agricultural education model (middle circle of the system in Figure 3).

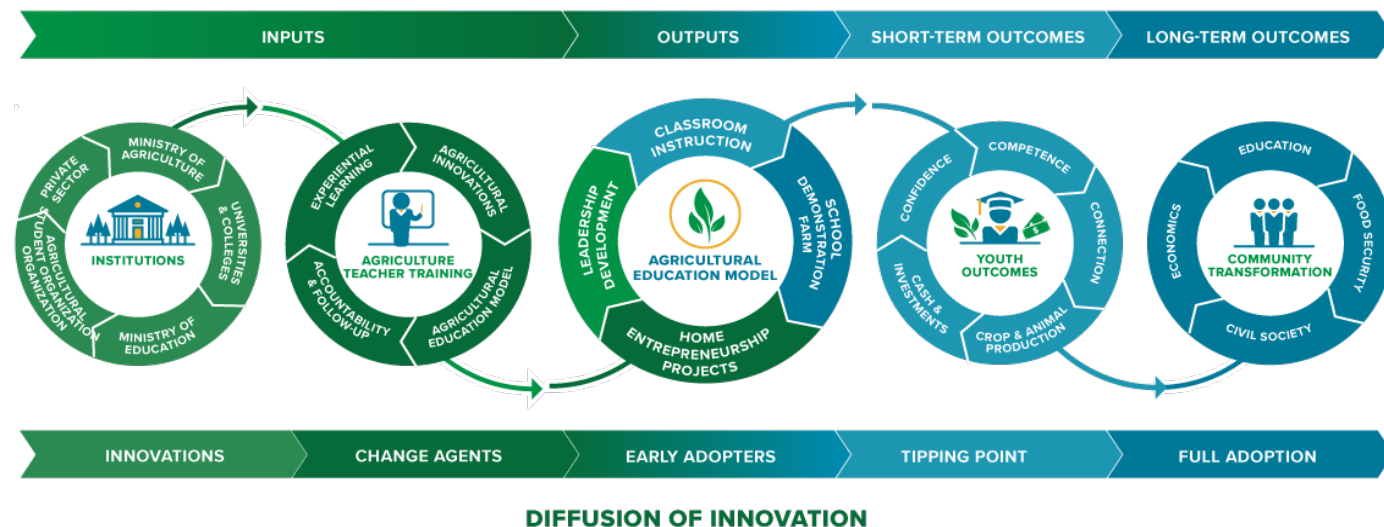
Serving as opinion leaders and early adopters, youth and Parent Teacher Association (PTA) officials establish demonstration plots throughout the community, increasing observability and speeding up the rate of adoption (Rogers, 2003, p. 389). A tipping point occurs when enough members of the community have adopted the innovation, and “further rate of adoption becomes self-sustaining” (Rogers, 2003, p. 343). As there is an unlimited amount of innovation to be diffused, the process becomes a continuous flow of improved ideas into a rural community. Figure 3 presents a simple framework of what is, in reality, a non-linear and cooperative SBAE system created to diffuse innovation.

The system's efficacy is in direct proportion to the quality of its inputs. Innovations must show a degree of perceived relative advantage as compared with conventional inputs. They must be compatible with existing values and past experiences, and they cannot be too complicated or challenging to implement. Adopters ought to be able to test the innovations and observe their results (Rogers, 2003, p. 15–16).

⁶ Everett Rogers (1931-2004) was a communication theorist and sociologist whose notable work, *Diffusion of Innovations* (2003), became widely accepted in communications and technology adoption studies.

Equally important, change agents must be hardworking, student-centered, caring, approachable and credible (Rogers, 2003, p. 400). As early as 1919, Rufus Stimson wrote that the success of agricultural education depended on the selection of qualified individuals as teachers: “Agriculture college training is highly desirable,” but “lifelong farm experience is almost indispensable” (Stimson, 1919, p. 271).

SCHOOL-BASED AGRICULTURAL EDUCATION SYSTEM



*Figure 3. School-Based Agricultural Education System.
Each of the five elements is discussed in detail in sections 2B through 2F.*

Schools are convenient focal points. They allow the diffusion of agricultural innovations while also providing several key benefits. The school-based approach:

- amplifies extension, as a small number of well-trained agents can leverage agricultural science teachers as diffusers of agricultural knowledge – in this way, school-based agricultural education is school-based extension;
- creates sustainable knowledge bases – empowering rural schools and students to maintain school demonstration farms and home entrepreneurship projects as both demonstration sites and revenue-generating activities;
- allows scalability and coordination of extension, incorporating improved agricultural innovations into the national curriculum of school-based agricultural education;
- builds on experiential learning, a student-centered pedagogy that describes how humans learn, develop and grow – this perspective of learning extends far beyond the traditional psychological view of learning and acknowledges that learning is a life-long process of adapting to one’s environment;
- responds to agricultural labor market demands due to stronger links between rural schools and agricultural institutions – these links better prepare students with the appropriate skills necessary for career success;
- allows students to learn the core life skills necessary for both active participation in and contribution to civil society – through the PYD approach to leadership and entrepreneurial endeavors.

The following sections of this chapter make a left-to-right journey across the SBAE system illustrated in Figure 3, explaining its flow in both academic detail and first-hand observation.

SBAE curriculum and methodologies must address and integrate gender equity...

The case for equitably engaging women in agricultural training, extension and post-secondary education programs is consistently cited by FAO, USAID, NGOs and the agricultural policies of many countries. Because age is a significant factor that shapes how women and girls experience gender inequality, gender equity interventions can – and should – start even earlier.

Adolescence is a critical life stage, during which the opportunities and constraints girls face shape their futures as adult women (Van Eerdewijk, *et al.*, 2011). SBAE programs provide ready-made opportunities to engage girls in agriculture in culturally appropriate ways. It also sensitizes them and their male classmates to limiting beliefs about gender roles, and empowers girls with the agency and voice essential for robust agricultural development (Van Houweling, *et al.*, 2015).

SBAE systems committed to gender equity can bring the kind of agricultural knowledge, technology, business acumen and access to inputs that is largely out of reach for rural women in Africa. Leadership opportunities for girls within an SBAE agricultural youth organization has proven to be a powerful retention tool to keep girls in school.

A US study found that girls who participated in 4-H programs were 2 to 3 times more likely to take part in science programs compared with girls participating in other after-school activities (Lerner and Lerner, 2013). When a gender equity study in Tanzania 4-H identified barriers that kept girls from engaging in SBAE at the same rate as boys, such as gender-determinant agricultural activities, it issued new guidelines for parents, youth and agriculture teachers to make their activities more equitable. These guidelines have been adapted by SBAE programs in several countries in SSA (Crave and Mbala, 2011).



2.B Institutions

The foundation of the framework connects existing agricultural and educational institutions into a replicable SBAE system. These collaborating institutions can be public, private, formal and informal.

1. Ministry of Agriculture

The Ministry of Agriculture provides agricultural research, knowledge and extension of the best agronomic practices and available technologies suitable for local farmers. This may also include other ministries or affiliate and autonomous government agencies engaged in agriculture, depending on how a country's ministries are organized.

2. Ministry of Education

The Ministry of Education oversees schools, teachers, and the curricula and assessment tools fundamental for the SBAE system.

3. Universities and colleges

Colleges of education and agriculture educate and certify future agriculture teachers in improved agricultural innovations and the experiential learning methodology of the model.

4. Private sector

Private agribusinesses develop agricultural technologies that improve crop yields, while also linking graduates of agricultural education to labor markets.

5. Agricultural student organizations

Agricultural student organizations, often called 4-H, Future Farmers or Young Farmer Clubs, can be government, non-government or public-private partnerships. They administer programs and utilize field officers to coordinate agriculture teacher trainings, student leadership camps, competitions, and agriculture fairs and exhibitions.



Figure 4. SBAE Institutions

"The challenge of transforming agriculture in Africa must be reframed as transforming agribusiness development through youth involvement."

Dr. Namanga Ngongi
Past President of AGRA

Scale-up strategies start with institutions

The long-term success or failure of SBAE will depend entirely on the strength of alliances built among collaborating institutions. First, collaboration drives the diffusion of agricultural innovations, developed by the Ministry of Agriculture or a similar institution, through schools overseen by the Ministry of Education. Second, collaboration diversifies funding, which is necessary for operational sustainability. SBAE has lasting viability only when national governments take the lead and collaborate across ministries. In this vein, the direct involvement of Ministries of Finance, Trade and Commerce is critical for securing additional budget funds, which the Ministries of Agriculture and Education generally do not have.

Ministries can collaborate through various structures in SBAE. In the United States, the Smith-Hughes Act of 1917 created a Federal Board for Vocational Education, which comprised the Commissioner of Education and the Secretaries of Commerce, Labor and Agriculture. In Liberia, representatives of the Ministries of Agriculture and Education originally formed a Joint Department Program to house agricultural education (MOE, 2010). In Ethiopia, before the 1974–1987 communist regime, the operating agreement for an SBAE program included the Ministries of Education and Agriculture and the Imperial Agricultural College – all agreeing to “develop and approve the curricula for the schools and direct the educational program” (Oklahoma State University, 1969, p. 61).

Today, more than 1,600 institutions of higher education across SSA teach agriculture and related studies (Cletzer, Drape, *et al.* 2016, p. 79), but they are seldom synchronized with the primary or secondary levels (Vandenbosch, 2006, p. 27). These colleges and universities, which prepare agriculture teachers, extension agents and researchers, could provide the institutional foundation for shaping SBAE.

Throughout the past decades, private investment for agricultural research and development (R&D) has outpaced public investment (Pray, 2015, p. 399). As of 2013, the private sector accounted for more than 75 percent of all R&D expenditures in the United States (Clancy, 2016). While these percentages vary among countries, the trend is the same for both high-income and low-middle income countries (LMICs) (Pray, 2015, p. 399). A well-developed SBAE system has the potential to improve linkages between the public and private agriculture sectors (Vandenbosch, 2006, p. 102). Not only can private agribusinesses make a tremendous contribution to SBAE through curriculum development and technology diffusion, it is also in their best interest to do so (Yeboah, 2018, p. 57). Agriculture is a rapidly evolving sector, and SBAE can provide a link from the private sector to farmers for improved innovations that increase agricultural production and better equip students with the necessary skills for career success in today’s labor market.

A co-curricular agricultural student organization, such as 4-H or Future Farmer Clubs, can serve as the brand and collaborative mechanism for an SBAE system. In Kenya, Young Farmer Clubs promote competitions in agricultural production and livestock judging. They receive support from the Agricultural Society of Kenya, and their members’ practical involvement reinforces what is taught in the classroom (Vandenbosch, 2006, p. 98–99). The agricultural student organization links the school and community, providing development opportunities for youth.

SBAE expands in Ghana with support of 4-H, government and private sector⁷

In 2012, DuPont Pioneer, a US-based seed company, partnered with 4-H Ghana to expand SBAE into more schools. 4-H Ghana established a 4-H District Management Committee comprising representatives from the Ghana Education Service (GES), Ministry of Food and Agriculture (MOFA) and the District Assembly.

In order to coordinate the expansion, 4-H expedited a Memorandum of Understanding (MoU) between MOFA and GES. With GES's approval, the MOFA extension agent can approach a school's headmaster and introduce the 4-H concept. If the headmaster is interested, he or she then appoints the integrated science teacher to be the club advisor. The extension agent helps the school develop a plan based on the agricultural needs of the area and determine which projects – such as bees, vegetables, maize or livestock – are relevant. Funding can come from a variety of sources, including the private sector, government and membership dues. In Ghana, some schools can purchase seeds and fertilizer on credit from the government's Planting for Food and Jobs program.

Parents learn from youth, but it takes something novel to get their attention. For instance, the students planted cabbage on the school farm, which many locals had never seen before. According to Edward Sawodji, an agriculture extension officer, "They come just to have a look, and that is the aim. When the children go home after school, they tell their parents what they have grown and what they have learned. So, the parents really are learning from their children."



⁷ Stories are based on field research conducted by the author in Ghana and Liberia in 2018-19.



2.C Agriculture Teacher Trainings

To diffuse innovations, teachers are equipped as change agents through a continuum of three agriculture teacher trainings coupled with continuous accountability and follow up.

1. Experiential learning methodology

Teachers connect the agricultural science curriculum to experiential learning pedagogy. They use the school demonstration farm and other tools to improve teacher and student performance.

2. Agricultural education model

Teachers learn the problem-solving methodology in the four components of the agricultural education model: classroom instruction, school demonstration farm, home entrepreneurship projects and leadership development.

3. Agricultural innovations

Agriculture teachers and PTA members attend in-depth trainings on research-based agricultural practices and technologies. When appropriate, government or university-led research farms should be utilized.

4. Accountability & follow up

Field officers, extension agents or agricultural education supervisors guide approximately 20 SBAE programs, ensuring innovation and pedagogy are correctly enacted. Additionally, teacher peer groups can hold each other accountable and share new ideas through regular meetings and social media.



Figure 5. SBAE Agriculture Teacher Training

"I believe fervently that practical, hands-on training is essential to the conquest of hunger..."

Dr. Norman Borlaug
1970 Nobel Peace Laureate

Effective training equips teachers as change agents

Africa is undergoing a learning revolution – one that enhances how teachers teach and how students learn. The power to transform critical thinking skills and build technical abilities through experiential education is recognized as central to a vibrant, empowering educational experience. However, classroom lecture has remained the primary method of teaching agriculture, while techniques that foster critical thinking and problem solving, such as demonstrations, practical projects and experiments, are hardly used (Vandenbosch, 2006, p. 79). Yet, “agriculture is an experiential rather than theoretical subject. Neither advancements in technology nor good curricula can overcome the necessity of ‘learning by doing’ in agriculture” (Yeboah, 2018, p. 59). Less than 50 percent of secondary agriculture teachers in SSA hold degrees or diplomas in agricultural education (Ngessa, 2006), but even the 50 percent with diplomas have only experienced education through lectures (Vandenbosch, 2006, p. 70). Few agriculture teachers have ever been trained in student-centered, experiential pedagogy.

To properly equip agriculture teachers as change agents, pre-service education must be supplemented with in-service training workshops. Teachers must be trained in the proper pedagogy of the agricultural education model – a proven model that trains young people in the livelihood and core life skills necessary for careers in and out of agriculture. According to Felix Yeboah, writing for the Chicago Council on Global Affairs, agriculture teachers should also receive training in how to facilitate learning more experientially. “Teachers must feel empowered to use school farms and gardens as learning laboratories. Supervised, hands-on projects must become an integrated component of all agricultural education” (2018, p. 59).

Accomplishing this, as noted above, requires implementing a continuum of in-service trainings with adequately prepared trainers. AgriCorps has developed an SBAE training-of-trainers manual consisting of five modules: Overview of School-Based Agricultural Education, 4-H Club and Leadership Development, Student-Centered Teaching Methods, School Demonstration Farm and Home Entrepreneurship Project. These lessons can be adapted for the introduction of SBAE to any country in SSA.

Ensuring that agricultural innovations and pedagogy are correctly implemented calls for identifying field officers or agricultural education supervisors to oversee SBAE programs, limiting a supervisor’s oversight to 20 programs or less. These field officers should have advanced experience and training compared with the teachers they oversee. Additionally, teachers can hold themselves accountable through communities of practice, organized through communication and social media technologies such as WhatsApp or Facebook.

For SBAE to maintain full impact, training should not be limited to teachers. Because SBAE is a vehicle for rural and agricultural transformation, local leaders should also be included. When a PTA member, lead male farmer *and* lead female farmer attend an agriculture workshop, adults are nudged (influenced) to observe the improved innovations demonstrated on the school farm. School administrators’ support is also crucial; headmasters or principals should attend relevant workshops that could benefit the school’s overall performance.

Teacher trained in SBAE method brings excitement to classroom and the field

Simon Iddi has taught integrated agricultural science for six years at Waribogu Junior High School in Ghana's Northern Region. Although he oversaw the school farm during his first years as a teacher, it wasn't until he was introduced to 4-H Ghana that he learned how to use it as a tool for practical learning.

During his time at the school, Mr. Iddi has participated in ten 4-H-Ghana sponsored workshops facilitated by various government and non-government groups – workshops that have cultivated his knowledge of agricultural practices and experiential learning pedagogy. Each time he returns from an SBAE workshop, he introduces something new to his students: a new crop, a new song, a new teaching method, a new agronomic practice, or a way to improve gender equity. 4-H Ghana has become a conduit to enhance his teaching skills in the classroom and the field.

He recognizes that seminars and workshops enhance teaching practices. "We have an education background, but we need regular workshops to improve constantly. The 4-H Ghana and AgriCorps workshops are fully practical, demonstrating how to facilitate experiential learning by combining agriculture curriculum and practical activities. The students love when I return from a workshop because I always introduce jovial, student-centered methods and techniques to motivate students to learn – including singing. As a result, they are happy and excited about class and 4-H."

Osman Alhassan, a 4-H Ghana Regional Coordinator, visits Woribogu every 2–4 weeks to support the 4-H Club and the community. He has brought in a network of community leaders, including the community's chief, agriculture chairman and school headmaster. Their support has given Mr. Iddi the motivation and network needed to build an SBAE program that can impact the entire community.



2.D Agricultural Education Model

Experiential learning that connects classroom content, school-based agricultural experiences, home projects and personal leadership skills frame the four-component agricultural education model.

1. Classroom instruction

Abstract agricultural knowledge is an essential element in developing a student's ability to solve complex agricultural problems. It is critical that experiential learning includes a deep commitment to building students' understanding of agricultural language, core agricultural science, technology, engineering and math (STEM) principles, agricultural economics and locally relevant governmental structures. The classroom provides a learning space to support students' ability to correctly label and reflect upon their experiences.

2. School demonstration farm⁸

The school demonstration farm connects science to practice on a student-led farm, introducing improved innovation to farmers in the community. Classroom instruction, purposefully partnered with concrete agricultural experiences, allows for valuable scaffolded knowledge as students develop sound agricultural practices.

3. Home entrepreneurship project

Home projects allow students to "learn and earn," receive individualized instruction from their agriculture teacher in the school and spread knowledge to parents and farmers in the community. Agricultural education, from inception, made instruction relevant to students by connecting to their entrepreneurial interests.

4. Leadership development

Leadership development equips students with the core life skills and confidence necessary for success in civil society. Through agricultural student organizations, students participate in leadership activities, public speaking presentations, parliamentary procedure competitions, crop and livestock judging, agriculture fairs and leadership camps. These experiences also serve as a source of motivation, as students engage in a community of students with established recognition, awards, traditions and opportunities to lead.

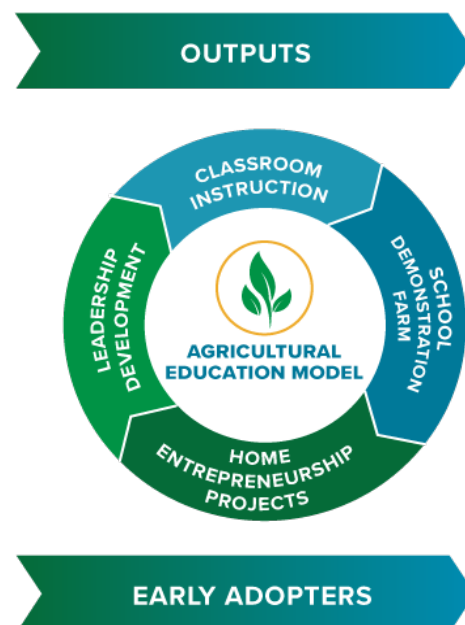


Figure 6. Agricultural Education Model

⁸ While SBAE follows the tenants of PYD, practitioners should always be mindful of concerns regarding child labor, which is defined in Article 32 of the United Nations Convention on the Rights of a Child (1989) as "economic exploitation" and work that is hazardous or could "interfere with the child's education or be harmful to the child's health or physical, mental, spiritual, moral, or social development." However, the International Labour Organization (1999) differentiates between this type of child labor from appropriate child work performed under SBAE, which it defines as "light work that is not harmful but which contributes to children's development and provides them with skills, attitudes, and experience that make them useful and productive members of their community during their adult life."

“Liberating education consists in acts of cognition, not transfers of information.”

Paulo Friere

Pedagogy of the Oppressed

Four-component model integrates abstract concepts with concrete experiences

The four-component agricultural education model capitalizes on the holistic learning process outlined by experiential learning theories. In the decades since it was first introduced, agricultural education has integrated the concrete experiences of students with abstract scientific knowledge, creating a motivational structure for students to connect, compete and grow personally (Phipps, 2008).

The agricultural education model purposefully includes valuable abstract conceptualization in the learning process. Experiential learning is often called a “hands-on” approach. However, the inclusion of purposeful time to reflect upon one’s experience, attach labels to experiences and make sense of one’s experience is even more critical. Classroom instruction is a crucial component of the agricultural education model. Students are not just making sense of their experiences alone, but are guided by an instructor in creating sound theories and agricultural concepts. While agriculture and science curricula across SSA could be significantly improved, this model is based on the assumption that in agriculture, imperfect curricula taught well is better than excellent curricula taught poorly.

The school demonstration farm serves as a valuable bridge from the classroom to practice. For example, Benedict Wyanquo, a 4-H Liberia field officer, takes his students to the field to teach through demonstration, knowing that “on the field, they will reaffirm the math, English and social studies taught in class.” Experiential learning processes require opportunities for active experimentation where a safe and low-risk learning environment is provided for students to apply what they recently learned in a concrete setting. While many schools across SSA maintain school gardens or farms, they are primarily used as a source of food for school feeding and a tool for punishment. Further, teachers often use them for personal gain.⁹ The agricultural education model transforms the school farm into a learning laboratory and community demonstration site. Agricultural mentors and experts have the opportunity to provide feedback to students on various skills, support them in establishing goals and monitor their success over time.

⁹ “Some schools rely on agricultural projects to maintain teachers and students. Students contribute to the costs of schooling with their labour on the school farm, as an indirect school fee. In some cases, this economic objective counteracts pedagogical objectives, as the poorly paid and unmotivated teachers are tempted to use the proceeds of the school farm as an additional income for themselves. This situation, coupled with an authoritarian school climate where students have little or no participation in the management of their agricultural produce, easily generates a teacher-student relationship of mutual mistrust and bitterness, where students feel exploited as cheap labour for the teachers’ benefit” (Vandenbosch, 2006, p. 36).

The home entrepreneurship project puts student interest and experience at the center of the instructional model by creating a motivational foundation to drive the remaining portions of the model. Student expectations become connected to their agricultural ventures, and the values related to education become more relevant. Some students organize group projects, but most are individual as money is usually the motivation behind home projects, which can be located on the family farm or a separate plot of land within the community.

Leadership development focuses on building human capital and community. Through the structure of a co-curricular agricultural student organization, such as 4-H, Future Farmers or Young Farmer Clubs, students make the major decisions on the school farm, including types of crops, labor schedules, and how to use the produce or income generated from the farm.

The students in an agricultural student organization elect officers to run and organize meetings. Officers open each meeting with a ritual, honoring agrarian values such as hard work, unity, stewardship, respect, wisdom and citizenship. The ritual uses local agriculture symbols to create awe and inspiration around a sector many view with shame or disdain. For example, in 4-H Ghana, the vice president is seated by a cutlass and hoe – the basic tools “required to properly maintain a farm” – metaphorically representing the hard work necessary for the vice president to support the president. The secretary commits the club to follow the example of maize farmers who “keep a record of their harvest” (4-H Ghana, 2017). Parents and local farmers often attend meetings, and the ritual forges a bond of respect between generations. It creates what Rufus Stimson, an early twentieth century agricultural educator, called “dignified agriculture” (1932).

Leadership activities aren’t only for student executives. Older students teach younger students on the farm – giving them confidence and responsibility. Members learn to speak, debate and vote on important items, such as how to spend money from the school farm. One instructor described his role in advising students as guiding them to make their own decisions. “We will not allow them to squander the money, so we oversee them, but ultimately it is up to them.”

Under the administration of an agricultural student organization, students partake in friendly competitions. 4-H Ghana hosts Leadership, Education, Agriculture and Development (LEAD) contests to instill confidence, promote understanding of a topic and provide opportunities for new student experiences. Competitions include parliamentary procedure, debate and public speaking. 4-H Liberia hosts a one-day agriculture fair in Monrovia where students showcase their produce and compete in a school farm competition. These experiences generate excitement and motivate students to learn and excel in agriculture.

Appendix A outlines the nudges and interventions that the four-component agricultural education model utilizes to encourage learning, diffusion and adoption of agricultural innovations.

Students host gala and soccer match to introduce community to their agricultural success

When SBAE advisor Gouly Patrick and colleagues received six days of training from Liberia's Central Agriculture Research Institute (CARI), the entire community learned that "farming is a business." During his training, he learned to facilitate experiential learning and how to make business plans, and he was brought up-to-date on many practical agriculture skills, including vegetable, cassava and rice production, nursery and garden bed construction and post-harvest storage. Each session started with a presentation followed by a practical demonstration, which he considers the most fundamental component of the SBAE method because "what you teach on the blackboard is what you implement in the field."

He brought the new ideas back to his school in Bellemu Town and organized a 4-H Club and school demonstration farm. Twenty students participated, holding monthly 4-H meetings where they learned public speaking and how to run meetings with basic parliamentary procedure. He divided students into groups of four for home projects and taught business planning and record-keeping. To have community impact, he involved community leaders and the PTA.

Within one season, the school farm's harvest turned a profit. The students voted to use the money for an end-of-school gala day – and invited the whole town. The students bought refreshments and even paid for the transportation of another school to play a friendly soccer match. They never asked anyone in the community to contribute, so parents wanted to know where these students had received the money. When they heard it came from the school demonstration farm, they wanted to see it and learn more. When they saw the new methods, which the students had practiced so well, they took the ideas home to their own fields.



2.E Youth Outcomes

As adults witness youth outcomes, they also begin adopting agricultural innovations, creating a tipping point of adoption within the community.

1. Competence

Youth realize increased performance in their academic and vocational skills.

2. Confidence

Youth develop core life skills, such as public speaking and problem-solving, and become more confident, interacting effectively and harmoniously with peers and adults.

3. Connection

Youth meet and connect with like-minded peers from culturally diverse communities across the country and participate in collaborative relationships with adults.

4. Crop & animal production

Youth increase crop and animal production, improving personal food security and nutrition.

5. Cash & investments

Youth gain greater agency over their lives as a result of earning cash through home entrepreneurship projects and investing that cash towards their education or enterprise.

SHORT-TERM OUTCOMES



TIPPING POINT

Figure 7. Youth Outcomes

"The better part of courage is the courage of having done the thing before."

Ralph Waldo Emerson

Students grow through positive youth development

In 2013, Lerner and Lerner tested the programs of 4-H in the United States against the five C's of PYD: Competence, Confidence, Connection, Character and Caring. The study found that, compared with their peers, 4-H youth also excelled in a sixth "C," Contribution "to self, family, community and the institutions of civil society." Preliminary findings from research conducted by AgriCorps in 2018 support these positive youth outcomes in West Africa, with only a slight variation.

AgriCorps has recognized two additional C's prominent in the research – Cash/Investments and Crop/Animal Production. For students with home projects, earning money was the most exciting aspect of the program. It gave them agency over their lives since they no longer needed to ask family members to purchase everything for them. They used the money for food, clothes, school fees, supplies, college entrance exams and better inputs for their farm. They also enjoyed their earnings – through purchases of soccer balls, soccer uniforms, soccer shoes and even mild forms of conspicuous consumption, such as an extravagant number of pencils to show off to their classmates.

One Ghanaian student said, "Anything you learn in school, you can take home to start your farm. You won't just read it or hear it, but you will experience it physically." Student projects could involve poultry and livestock rearing, vegetable production, grain production and conservation agriculture. Projects start small and grow over time. Two brothers in Ghana began growing tomatoes in old grain sacks and, within two years, saved enough money to purchase a pig for reproductive purposes.

Through the excitement and leadership development within an agricultural student organization, students expanded their confidence and world experiences. "4-H has given me self-confidence, taught me how to speak in public and sent me places I've never been," said one student. Through leadership camps and agriculture fairs, students connected with other students across the country interested in agriculture. At the 4-H Liberia National Agriculture Fair, when a young 4-H member met youth from other counties, he heard languages from ethnic groups he never knew existed. "I didn't know what they were speaking, and they couldn't understand me," he said. Despite this, they became friends and discussed the differences in agriculture among their communities. "Liberia is a friendly country," he said – a notion of great significance considering Liberia's recent past.

Students also connect with adults, sometimes playing the role of student and occasionally playing the role of teacher. "Most farmers have never been to school," a Liberian student said, "so they ask me how I plant corn in the dry season." These positive experiences with adults increase the desire of young people to contribute to their community. Many of the youth who have worked with farmers intend to study agriculture in post-secondary school, hoping to return and assist more farmers with better knowledge.

SBAE students profit from learning in classrooms and practicing in the field

George Daniel, 4-H secretary at St. Augustine Junior and Senior High School in Bolahun Town, Liberia, keeps the financial records for the school demonstration farm, tracking expenses and receipts, and calculating the profit for the whole club. Last year, the 25 student-members initially planted potatoes in the school farm, but then planted cassava when they saw it had a higher demand. After a profitable harvest, they used some money to purchase inputs for the next year and then voted to use the rest of the funds to help the club's less fortunate members. As far as George Daniel is concerned, "4-H has made me understand that agriculture is good, and even if I take other sciences in school, agriculture is the most important."

The experiential learning methods of SBAE have inspired him. He wants to go to college and study agriculture so he can return to his community to farm and teach others how to be better farmers. Before 4-H Liberia, there was no practical aspect to agriculture at school; it was only taught in the classroom. "Agriculture is fun because we are learning in the field." SBAE has taught him how to grow rice in a nursery and transplant into the swamp, in addition to appropriate garden bed construction and vegetable production. As for his cassava and pineapple home project, "I've done it for two years, and it produced well."

He keeps records and conducts a market assessment, producing what people need. "I will take their names and plant the crop they want and sell it to them at harvest." Last year he made \$3,500 LD (\$35 USD). He used some of the money for school supplies and his family, but he also bought a football because "I'm still a kid, and it's fun."

Most of all, 4-H Liberia has enhanced his confidence. "4-H has taught me how to be a leader, live at home, and do agriculture that will benefit me tomorrow. Even though I am young, my older friends have made me their leader because of the experience I get from 4-H."



2.F Community Transformation

As improved innovation moves to full adoption, youth contribute to the transformation of the local community at four different levels.

1. Food security

Increased agricultural production increases the quantity and nutritious quality of the local food supply.

2. Economics

Incomes improve through increased agricultural production and value-added agribusiness opportunities.

3. Education

Parents benefit economically from their children staying in school, teachers are better equipped to teach and student performance substantially improves. As more students stay in school, the education level of the community increases.

4. Civil society

The perception of youth, by adults, shifts into a more collaborative role within local society. Local institutions and participatory government are strengthened through leadership development taught through the school, and cultural diversity is celebrated through shared interests.



Figure 8. Community Transformation

"If young people have a new method that could benefit us, we must listen. Everyone wants the best ideas. No one will mind that they are small, as long as the idea they share will help you be more productive. Because of the education learned through SBAE, new methods will be adopted, and more food will be produced."

Benjamin Kpoquinyan

Chairperson, Parent Teacher Association
Bellemu Town, Liberia

Diffusion of innovation leads to improved family and community agriculture

School-based agricultural education is a fundamental channel for diffusing¹⁰⁰ agricultural innovations into the social system of a rural community. This was the original intent of SBAE when it was established in the early twentieth century by Rufus Stimson, who called the model an agricultural “service system operating through local schools” (Stimson, 1946).

It is important to note that this diffusion is not linear. It is a back-and-forth dialogue between scientific and local knowledge that happens through the forum of the school (Vandenbosch, 2006, p. 105). These innovations spread to the community through small nudges, including:

- home projects on the family farm, near the home or on a well-trodden path;
- PTA involvement on the school demonstration farm;
- farmers’ field days led by the agriculture instructor;
- parents attending an agricultural student organization’s garden-bed construction competition between two teams, competing on speed and precision;
- school demonstration farms comparing a traditional system to an improved system.

Increased production can lead to value addition, as was the case for one group of Liberian farmers who bought a cassava processing machine after increasing production due to methods taught by SBAE students. Another community in Ghana produced so much maize, the agriculture teacher launched a “one-child-one-fowl” program, instructing each child to bring one chicken, usually roaming free, to school. Chickens were fed maize and used to teach intensive poultry production. “Now,” the teacher reports, “chicken has become a staple, and most families eat chicken every day.”

The 4-H Club in Korm, Ghana, started a scholarship fund out of proceeds from the school demonstration farm. Between 1962 and 2012, only three graduates of the junior high school had completed senior high school, but thanks to the availability of the scholarship fund, more than 25 students – all 4-H members – have graduated. The focus on education also reduced teenage pregnancy to almost zero in the community. As one father proudly said, “My daughter just graduated from senior high school. Had she been three years older, she would have missed out on 4-H and would probably have two or three kids by now. Instead, she has a high school degree.” Another graduate returned to the community as a healthcare worker.

The impact starts with agriculture but quickly incorporates aspects of civil society, including, most importantly, the family. Parents see the improved confidence their children display after returning from agricultural student organization activities, such as leadership camps or agriculture fairs, and ask if they can participate in the same transformational experience. In the eyes of adults, youth evolve from being a family burden or cheap labor source to an equal, contributing member of the community. As one Ghanaian agriculture extension officer noted, “Now the father sees the son as a grown-up.”

¹⁰ In his seminal work, *The Diffusion of Innovations*, Everett Rogers (2003, p. 5) defined diffusion as “the process by which an innovation is communicated through certain channels over time among the members of a social system.”

Father of nine learns improved agriculture from youngest child, sees yields increase

“I have been farming for 50 years and what do I have to show for it?” asked Shahadu Nayi, a smallholder, subsistence farmer in Ghana’s arid Northern Region.

“The students are learning about new crops and approaches that we, their parents, don’t know.” Mr. Nayi has nine children. His youngest was a member of the 4-H Club in the local junior high school where he learned new approaches, including rotational cropping systems, fertilizer application and the importance of growing nutrient-enriched crops such as orange-fleshed sweet potato. A few years ago, during harvest, Mr. Nayi’s son helped him on the farm as extra labor. In the middle of the exhaustive, backbreaking work, his son exclaimed, “Dad, you shouldn’t mix all the crops together! When you grow maize, grow maize. When you grow cowpeas, grow cowpeas. Then, you will get better yields.” Mr. Nayi had seen the increased production yields of a rotational mono-cropping system on the school’s 4-H farm, so he listened. “As a farmer, the students formerly learned from us. Today, we learn from the students.”

For the past three years, Mr. Nayi has planted his crops in rows, rotating them annually according to the new method. “Previously, when I was farming under the old method, my family would run out of food before the next harvest and I would need to purchase food at the market. Today, with the method I learned from my son, I produce enough food to feed my family for the entire year. For 50 years, I spoiled the soil because I did not have the knowledge to conserve it. If I had been in 4-H when I was young, today I would be a rich man.”







Section 3. Underpinning Theories

3.A Experiential Learning: Capitalizing on the Process of Human Growth and Development

“Experience plus reflection equals learning.”

John Dewey

Experiential learning embraces how humans learn, develop and grow. It is not a mere set of activities, games or demonstrations. It is “the transformation of experience” into knowledge (Kolb, 1984, p. 38) – and a lifelong process of adapting to one’s environment.

SBAE initiates this lifelong process within a natural, community-based learning environment. As illustrated in Figure 9, SBAE provides and facilitates concrete agricultural experiences and challenges, on a school demonstration farm or home entrepreneurship project, to make agricultural education relevant. Students process these experiences through reflective observation with their teacher and peers. Agricultural teachers, supported by agricultural extension agents, provide evidence-based knowledge to help students conceptualize practical solutions and gather relevant information from the challenges experienced. Students then apply this new knowledge back on the school demonstration farm or home entrepreneurship project where they receive immediate feedback and assessment. With this, they transform their agricultural experiences into knowledge about the real world. This holistic process leads to behavioral change for an entire community – not just transferals of information to youth.

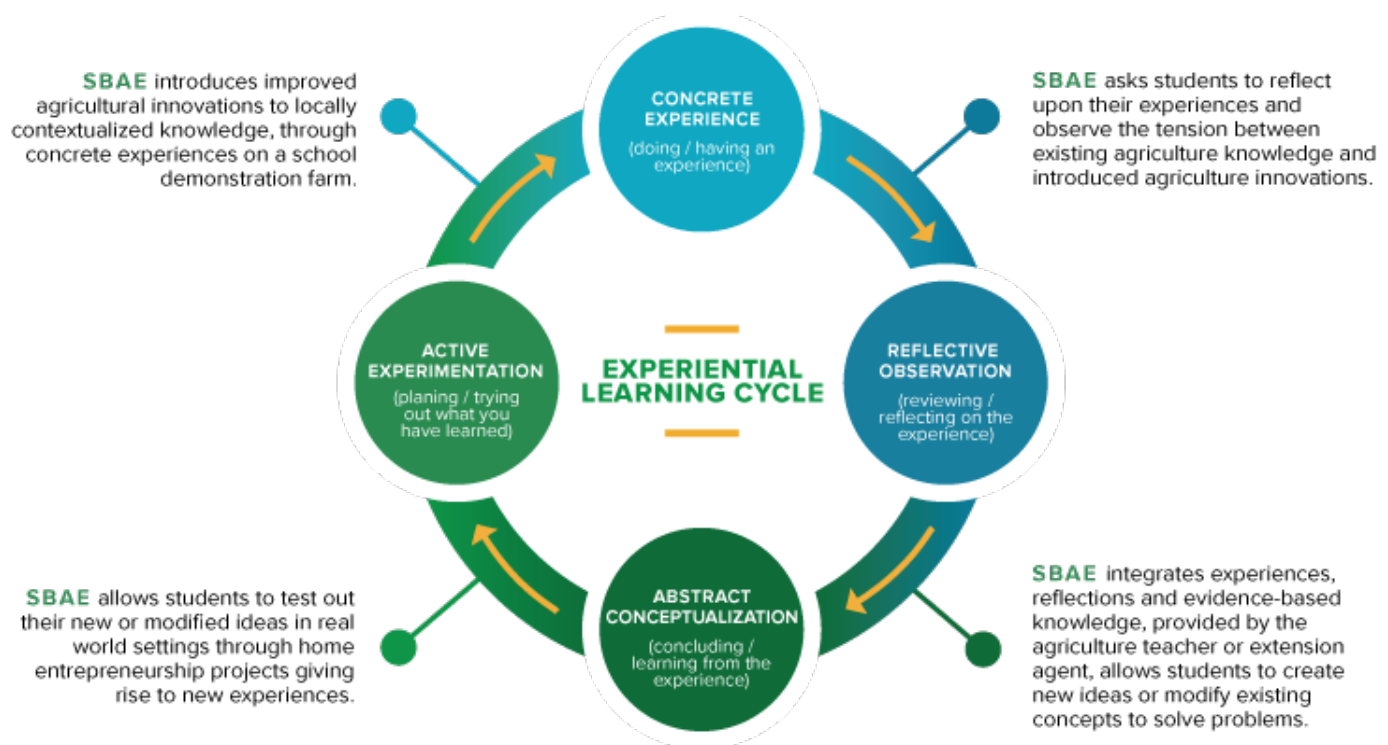


Figure 9. Experiential learning cycle aligned with SBAE approach.

Adapted from Kolb, 1984

The SBAE approach is built upon six characteristics of experiential learning identified by Kolb (1984). These characteristics can be found throughout the works of prominent twentieth century scholars of human learning and development, including William James, John Dewey, Carl Jung, Kurt Lewin, Jean Piaget, Paulo Freire and Carl Rogers.

1. Learning is best conceived as a process, not a set of outcomes

No living organism grows the same way, everywhere, every time. Each organism has a unique set of genetic codes and environmental conditions that affect its growth. Because agriculture is rooted in the study of living organisms, learning through SBAE is not static. It is not the memorization of immutable facts. Rather, it is the introduction of a unique learning process that synthesizes existing knowledge with new experiences and innovations.

2. Learning is a continuous process grounded in experience

SBAE is grounded in the continuous experiences on a school demonstration farm or home entrepreneurship project. These experiences are not isolated, but continuously build upon themselves with new experiences. This process allows learners to understand existing agricultural practices, synthesize them with new practices and engage in continual assessment of what is best.

3. Learning requires the resolution of conflicts between dialectally opposed modes of adaptation to the world

SBAE connects the opposed dialectics of thinking and doing through the combination of a traditional classroom structure and the school demonstration farm. The resolution between theory and practice *is* the learning process itself. This model takes learning beyond a textbook or a practicum and applies the creativity and personal development of the learner to conceive new knowledge for the community.

4. Learning is a holistic process of adapting to the world

Concentrated around the local school, SBAE is ultimately a social system of community learning and development. Parents, aunts, uncles, brothers, sisters, pastors, imams, chiefs, elders, shopkeepers, teachers, administrators, researchers, extension agents, farmers and youth collectively synthesize agricultural knowledge and innovations through the integrated functions of the entire human – “thinking, feeling, perceiving and behaving” (Kolb, 1984, p. 31).

5. Learning involves transactions between the person and the environment

Learners both shape and are shaped by their environment. This transactional process is notably true in the study of agriculture through SBAE. A learner experiences something about the environment (e.g. soil erosion), alters that environment (e.g. builds terraces), experiences something new about the altered environment, and repeats this process *ad infinitum*. SBAE is not based upon an adopted curriculum – devoid of application, discovery or invention. Rather, this transactional learning process is about solving problems using available knowledge, innovations, people and resources.

6. Learning is the process of creating knowledge

The creation of knowledge “occurs at all levels of sophistication, from the most advanced forms of scientific knowledge to the child’s discovery that a rubber ball bounces” (Kolb, 1984, p. 36). SBAE unites youth and adults to improve their ability to create new knowledge at both the personal and social levels. Though the starting point is a local school and agricultural student organization, the goal of SBAE is long-term growth and development in the production of food and fiber for the community. SBAE can lead to better test scores at the personal level, but it can also transform the participating community at the social level.

All humans are, by nature, learners. However, this natural process of growth and development is rarely aligned with how students learn in formal school settings. Research is clear, “filling the bucket” with abstract information simply does not lead to behavioral change. SBAE, through an experiential learning pedagogy, seeks to improve how learners think, how they make decisions and how they behave.

Making agriculture – and learning – sexy ...

Research has well established the positive correlation between motivation and learning (Dawes and Larson, 2011). David McClelland's (1961) human motivation theory outlines three types of motivational needs for youth as well as adults: achievement, affiliation and power. Motivation can come from one or a combination of the three. Those with the need for achievement appreciate challenges, goals and constructive feedback. Those with the need for affiliation favor collaboration over competition and want to belong to a group and be liked. Those with the need for power are motivated by winning competitions, recognition and status.

From the early days of SBAE, agricultural educators understood this while also realizing the need to instill pride and self-esteem in farm youth, who often feel a sense of inferiority when compared with urban youth. To give students a greater opportunity for self-expression and leadership development, agricultural student organizations were formed (Taylor and Crunkilton, 1979). The motivational and psychological impact of these agricultural student organizations transformed an experiential learning pedagogy into a movement of self-expression for farm youth – providing confidence, leadership and competitive opportunities.

Members of agricultural student organizations, such as Future Farmers, 4-H or Young Farmer Clubs, compete with their home projects in agriculture fairs, collaborate on a school farm, run for elected office and participate in leadership camps and activities. Trophies, medals, pins, uniforms, creeds and rituals all serve the motivational needs of students, enabling a deeper learning of agriculture. To phrase it another way, it makes agriculture and learning sexy.



3.B Behavioral Economics: Youth as Change Agents

"In the 1920s educational trains trundled through the [American] prairies, pulling boxcars of animals and demonstration crops. At each stop, hundreds would gather for public lectures. Older folk resisted such newfangled ideas as planting hybrid corn bought from merchants rather than seed-corn from their own harvests. Enter the 4-H movement, which gave youngsters hybrid seeds to plant, then waited for the shock as children's corn outgrew their parents'."

Lexington: Farming as Rocket Science

The Economist, September 7, 2013

Innovations elicit feelings of uncertainty within any social system (Rogers, 2003), and when that system is agriculture, the uncertainty becomes a major challenge in agricultural development. Since innovations are only as good as their adoption rate, adoption becomes the most critical component of the innovation process. As this guide has shown, SBAE offers a cost-effective complement to extension – one that integrates the essential conditions necessary for the adoption of significant agricultural innovations by deploying a growing network of junior and senior high schools across SSA.

Youth are often cast as early adopters within diffusion literature. However, no research definitively suggests young people, as a class, are innately more innovative or prone to be early adopters. In *Diffusion of Innovations*, Everett Rogers (2003) found research results to be inconsistent, determining: "About half of the many diffusion studies on this subject show no relationship, a few found that earlier adopters are younger, and some indicate they are older."

Rather than focus on youth solely as early adopters, SBAE equips and engages youth as change agents for their families and rural community.

Young people are an ideal entry point into a community because they are more easily influenced than adults, especially within a school setting. They are not blinded by experience and are better equipped with basic numeracy and literacy skills than older generations. Through the four components of the SBAE agricultural education model introduced in Section 2.D, instructors encourage students to practice improved methods and adopt better technologies. On the one hand, not doing so could potentially affect a student's school grades or membership in an agricultural youth organization; on the other hand, doing so will generate opportunities for achievement recognition, advancement and personal growth (Herzberg, 1968). The absence of these positive motivators in education throughout SSA makes SBAE all the more appealing. It is the differentiator.

In *Nudge: Improving Decisions about Health, Wealth, and Happiness*, Richard Thaler and Cass Sunstein (2009) suggest a theory of “choice architecture” – a created environment with many features, noticed and unnoticed, that influence (i.e. nudge) people to make better choices. SBAE is choice architecture, comprising a symphony of nudges to encourage teachers, students, parents and farmers to make better choices in agriculture. Appendix A outlines several of these nudges and interventions utilized by the four-component agricultural education model in nine different categories, based on Thaler and Sunstein (2009).

Many of these SBAE nudges are supported by agricultural development literature. Research from Kondylis *et al.* (2017) found that directly training opinion-leader farmers at a research farm, in addition to extension agents, improved adoption rates within a community. Echoing these findings, SBAE includes PTA representatives and opinion-leader farmers in the annual training on agricultural innovations at a local research farm. Additionally, farmer field days and side-by-side designs for demonstration of practices, which are key components of school demonstration farms, can induce social learning among farmers (Emerick and Dar, 2020; de Janvry *et al.*, 2019).

But the special ingredient of this mix is the students themselves. In a randomized study, Nakasone and Torero (2016) found that students in Peruvian high schools who received agricultural extension videos significantly influenced their parents’ knowledge and practices after a sustained eight-month intervention. This impact can be further enhanced through incentives – especially incentives that are conditional on other farmers’ knowledge of new practices. BenYishay and Mobarak (2019) have shown this to be effective in increasing the transmission of information within an extension program. This influence is also true with SBAE, with agricultural student organizations providing performance incentives, such as well-publicized awards, to motivate students to communicate new practices to their households and communities.

The evidence for youth as agricultural change agents can also be found in the history of 4-H in the United States. According to data from research conducted in 1957 in Cass County, Michigan, parents of 4-H members who were enrolled in specific 4-H projects, such as corn or dairy, for four or more years, were three times more likely to have higher adoption rates of approved extension practices than parents of non-4-H members or parents of 4-H members with limited tenure (Schlutt, 1957).

Engaging youth to frame the innovation

In their seminal 1979 study, *Prospect Theory: An Analysis of Decision under Risk*, economists Kahneman and Tversky suggested that people make decisions under risk based on gains and losses around a reference point – usually the status quo, but it could also be the expected outcome. For instance, if a farmer expects to yield 2 metric tons (mt) per hectare but only harvests 1.5 mt per hectare, then he experiences the yield as a loss. Similarly, if another farmer expects to yield 1 mt per hectare and then harvests 1.5 mt per hectare, then she experiences the same result as a gain.

To introduce agricultural innovations into a community, many development interventions focus on lead farmers who are literate, progressive and have considerably more resources. The expectation is that average farmers will admiringly observe the properly implemented innovation of a lead farmer and seek to replicate those innovations on their small farms. However, BenYishay and Mobarak (2019) found that lead farmers are significantly less effective at diffusing agricultural innovations than farmers who share a group identity under similar resources and agricultural conditions. In a separate study on latrines in Bangladesh, Mobarak suggested that better-off people are more likely to copy the poor than vice versa. In the study, latrines were constructed for the poor but not for the better off. Through a perceived loss of status, the better-off people were shamed into following suit. However, when a wealthier person has something, the less fortunate do not necessarily feel ashamed for not having it (Beating the Bugs, 2018). These observations affirm the Prospect Theory premise – that decision-making requires a gain or loss around a reference point, and a loss looms larger than a gain.

In rural, agrarian communities, the social status quo (i.e. reference point) typically reflects that the rich are better off than the poor, men are better leaders than women, and the old have greater knowledge than the young. These socially accepted reference points are linked to social expectations: If a rich person gets a little richer, the status quo does not change. If a man is named chief, the status quo does not change. If an adult is a better farmer than a young person, the status quo does not change.

However, if a young person outperforms an adult in growing maize because he or she used an improved seed while the adult used a traditional seed, the status quo shifts and a new reference point is established. In other words, the adult is less well off than his or her new reference point, and the sure-thing is experienced as a loss. Now, the adult wants to know how to grow the high-powered maize.

The “sense of loss” is so great, it can sometimes backfire, at least in the short term. In 1921, an Illinois farmer did not take kindly to his son’s success. In an account recalled many years later by a relative, the son’s “corn production was so much greater than his father’s that his father destroyed the 1-acre corn crop so as not to be embarrassed in the eyes of the neighbors. But, the next year, he did some of the things on his own corn fields that his son had done the year before” (Uricchio, Moore and Coley, 2013, p. 232).

When school-aged youth are viewed as change agents within their agricultural communities, an enhanced view of youth, education and extension emerges. Through a self-reinforcing web of small interventions and nudges, schools become incubators for context-relevant innovations. Schools in SSA already have the elements necessary for SBAE – classrooms, agriculture teachers, school farms, farming families and young people eager to learn and contribute ways to improve the livelihoods of everyone in the community.

The gamble or the sure thing?

How does a shift in reference point lead to taking a risk or a gamble? To illustrate how the mind perceives this shift, Kahneman and Tversky (1979) offer these two problems.

Problem 1. In addition to whatever you own, you have been given \$1,000. Of the following options, which do you prefer?

- Option A. Flip a coin and win \$1,000 on heads and nothing on tails.
- Option B. Receive a gift of \$500.

Problem 2. In addition to whatever you own, you have been given \$2,000. Of the following options, which do you prefer?

- Option C. Flip a coin and lose \$1,000 on heads and nothing on tails.
- Option D. Lose \$500.

In problem 1, most pick option B, the sure thing; in problem 2, most pick option C, the gamble. Why the switch? The two problems have identical outcomes. If you pick the gamble, you win equal chances at being worth \$2,000 or \$1,000. If you pick the sure thing, you are worth \$1,500. But when a sure thing is framed as a loss because the reference point has shifted (in this instance from the \$1,000 to the \$2,000 you have been given), people prefer the gamble.

That's what happens with adult farmers when their youth counterparts outperform them. The adults originally chose the sure thing of the traditional variety of maize seed, but when framed against the youth outperforming them with an improved maize seed, the traditional variety is experienced as a loss. Next time, the adult will choose the improved seed.





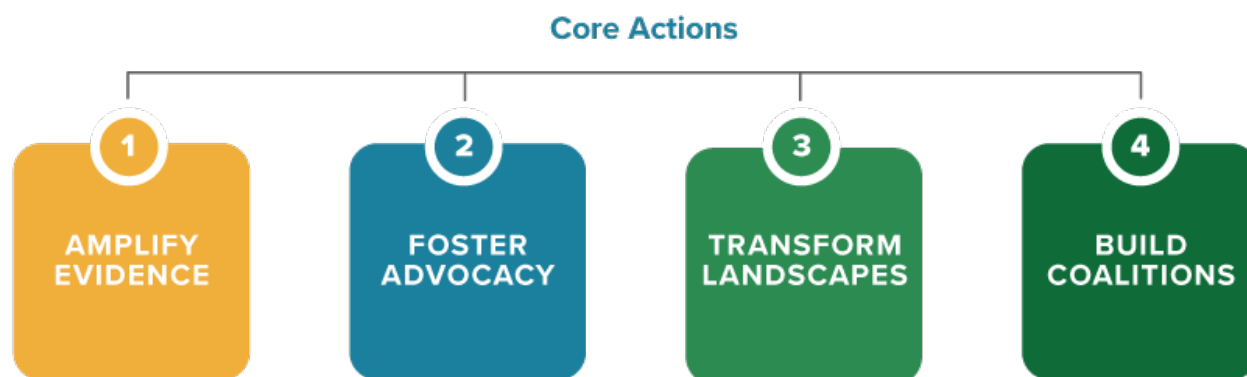
Section 4. Next Steps: The Movement to Advance SBAE

4.A The Secretariat

Prioritizing and investing in SBAE to enable scaled impact towards agricultural and rural transformation are critical. The Movement to Advance SBAE was launched in May 2020, to enable the integration and adoption of SBAE across SSA through diverse and existing pathways that reach school-based youth.

Looking toward the future, the Movement will require a diverse set of funding partners, robust evidence and enabling policy. Fortunately, these efforts align with many development commitments made by African governments, civil society, private sector companies and multilateral donors. The Secretariat and Leadership Council to the Movement comprise high-level political, business and philanthropic leaders.

The Secretariat's goal is to enable successful uptake of SBAE. Thus, its focus includes steps to: build coalitions to generate and disseminate research-based evidence, build awareness at local, national and global levels, and transform policy, program and investment landscapes. Its work is defined in terms of four core actions.



Core Action 1. Amplify evidence

Through the leadership and expertise of a third-party research team, the SBAE Council on Research and Evidence (SBAE-CORE), the Secretariat will drive steady and well-planned SBAE evidence conversations and uptake efforts that underpin the policy, investment and program actions required for successful adoption of SBAE. These efforts require the Secretariat to:

- support the generation of evidence to fill knowledge gaps and address barriers to scale;
- leverage existing bodies of evidence;
- promote the uptake of insights and best practices.

Core Action 2. Foster advocacy

Advocacy agendas focus on civil society mobilization and building a vibrant forum of local, country and regional allies. These forums create a platform from which to share experiences, demonstrate SBAE alignment with youth and agricultural development, and inspire greater implementation and investment commitments. These efforts require the Secretariat to:

- socialize evidence base and research efforts with civil society, academic and research leaders in target countries, private sector partners, UN agencies, multilateral donors and government ministry focal points;
- amplify appropriate agricultural innovations within country contexts.

Core Action 3. Transform landscapes

Transforming the policy, program and investment landscapes for successful implementation and sustained impact of SBAE requires clear pathways and well-developed policy platforms. The vision for this core action embeds SBAE into existing pathways, programs and policy imperatives. These efforts require the Secretariat to:

- identify SBAE implementation and delivery pathways;
- equip teacher-training systems to implement SBAE;
- collaborate with technical experts to integrate SBAE within local contexts.

Core Action 4. Build coalitions

Central to a vibrant movement is a dynamic, multi-sectoral coalition of supporters and partners. The vibrant SBAE coalition consists of mission-aligned institutions and individuals that have stood steadfast in their commitment to youth, agriculture, education, rural development and economic development. The SBAE coalition recognizes that agricultural transformation, through youth in schools, is a complementary, necessary and critical priority that is worthy of investment. Coalition partners will deploy a range of efforts to support and enable scale of SBAE across SSA. The call for support will extend to key partner groups – national governments, research institutions, donors, the private sector and civil society.

- **National governments.** Given the bold commitments to agricultural transformation, poverty alleviation and youth development, policymakers can integrate SBAE as a tool to support the realization of these commitments through policy enhancements, a dedicated ministerial-sponsored department for SBAE and national budget investment.
- **Research and academic institutions.** SBAE provides a pathway for the uptake of agricultural technologies, innovations and best practices that improve agricultural productivity and farmer incomes, and support resilient food systems that reduce strain on the environment. SBAE-CORE invites the research community and funders of research to complement existing diffusion efforts by using SBAE to engage youth as a viable conduit for widespread innovation adoption.
- **Donors.** The donor community has a vital role to play through donor-funded research, donor investment in systems transformation and donor investment in programs and policy development. The donor community has the opportunity to invest in scaling SBAE because it is a system that allows for widespread, local-level adoption of critical agricultural and youth-focused interventions. SBAE offers triple returns by: i) leveraging existing donor investments through empowering youth; ii) building local agricultural capacity through the adoption of innovations; and iii) enhancing the landscape of learning.
- **Private sector.** The private sector invests billions of dollars in agricultural research and development annually, but these investments can only have impact if they are adopted at the farm level. Private sector partners can support the Movement by investing in SBAE teacher capacity development and amplifying the message about the essential role of youth in agriculture to national and global leaders.
- **Civil society & development organizations.** Non-profit and community-based organizations have a critical role in advocating for the needs of youth and rural communities. Civil society is on the frontline, meeting the needs of building resilient communities. Its role in propelling SBAE includes building local capacity, raising awareness and being a powerful voice calling for dedicated investments in youth-centered agricultural development.

4.B Support from Coalition Partners: 10 Actionable Steps

The Movement to Advance SBAE is committed to taking coordinated and dedicated action. The Secretariat invites organizations from across sectors join the Movement to Advance SBAE by taking part in these 10 actionable steps in the country of its work. The Secretariat needs local coalition partners to enable SBAE to fit within a local context without giving up core tenants of the model.

1. Review national policies

Conduct a thorough review of national agriculture and education policies, including the National Agricultural Investment Plan (NAIP) for a particular country. Strategically align SBAE to government priorities and targets in agriculture and education.

2. Identify local drivers of SBAE

Research the history of SBAE within a particular country and identify existing agricultural education programs that could be leveraged and scaled up. It is often easier to leverage an existing local program than create a new one, especially where there is historical recognition and support.

3. Leverage institutional partners

Identify appropriate institutional and individual stakeholders of SBAE. Include the Ministry of Education, Ministry of Agriculture, Ministry of Finance, Ministry of Trade and Commerce, and agricultural colleges or universities in addition to appropriate private sector partners and donor agencies. Socialize SBAE among these stakeholders to create buy-in and support. Align SBAE to their missions and mandates.

4. Develop an agricultural student organization

An agricultural student organization, such as 4-H or a Young Farmer Club, is the fulcrum of an SBAE system. It convenes the various institutions and oversees the implementation of trainings, activities and oversight. Develop or build capacity for an agricultural student organization with trained staff and a governing body. This organization can be housed within a public institution or as a stand-alone NGO.

5. Assess agricultural development needs

Identify agricultural development needs within local contexts. Working alongside communities and national experts, identify interventions, programs and value chains that can be amplified through SBAE.

6. Assess local curriculum and innovations

Conduct an assessment of local agricultural science curriculums and agricultural innovations ready for scale. Align SBAE pedagogy and trainings to these inputs.

7. Select schools

Select pilot schools from politically diverse regions. Schools should willingly express an interest in participating, have an established parent organization that formally agrees to support students of SBAE, provide land near the school suitable for a demonstration farm, and designate a qualified agriculture instructor or local equivalent as the SBAE advisor.

8. Socialize SBAE with community influencers

Enable cross-community support for and awareness of SBAE by socializing SBAE at local levels among community leaders, parents, grandparents, women's groups, faith leaders, local government officials and other influential stakeholders.

9. Implement teacher trainings

Select and prepare experiential learning specialists and agricultural scientists to conduct in-service teacher trainings to launch SBAE programs in selected schools. AgriCorps has developed an SBAE training-of-trainers manual consisting of five modules: Overview of SBAE, 4-H Club and Leadership Development, Student-Centered Teaching Methods, School Demonstration Farm and Home Entrepreneurship Project. This curriculum can be obtained from AgriCorps or the Movement to Advance SBAE.

10. Develop a monitoring and evaluation plan

Establish a monitoring and evaluation (M&E) plan to assess the progress of objectives, including evaluation of SBAE implementation, youth development, agricultural innovation adoption rates, school-community engagement and overall impact of the program.

Advancing SBAE requires engagement and action from across sectors, and the Movement to Advance SBAE intends to be a highly participatory platform that enables a range of experiences, commitments and efforts to come to the forefront for sustained impact. With a focused agenda, the SBAE Secretariat envisions region-wide expansion, catalytic investment and global visibility of SBAE:

With Africa – By youth – For progress.



Appendix A: Interventions & Nudges for the Agricultural Education Model

	Classroom Instruction	School Demonstration Farm	Home Entrepreneurship Projects	Leadership Development
Defaults¹¹	<ul style="list-style-type: none"> ■ Automatically enroll all agriculture teachers in SBAE trainings. ■ Automatically enroll headmasters in SBAE overview training. 	<ul style="list-style-type: none"> ■ Automatically enroll all members of the agricultural student organization to work on the farm. ■ Automatically enroll PTA chairs or lead farmers to attend agriculture innovation training along with the agriculture teacher. 	<ul style="list-style-type: none"> ■ Automatically enroll every SBAE student with a home project. 	<ul style="list-style-type: none"> ■ Automatically set meeting rituals to open and close every agricultural student organization meeting. ■ Automatically enroll every SBAE student to memorize and recite the Agriculture Creed. ■ Automatically enroll every student to give one presentation at a club meeting each year.
Simplification¹²	<ul style="list-style-type: none"> ■ Design easy-to-read visual instruction posters. 	<ul style="list-style-type: none"> ■ Undertake side-by-side experiments in the school demonstration farm comparing new methods to traditional methods. ■ Align school farm with curriculum so it is seen to add value to classroom instruction and help students learn abstract theories. It should not be seen as added work. 	<ul style="list-style-type: none"> ■ Design easy-to-use template for teachers to implement home projects. ■ Design easy-to-use template for home project record-keeping. 	<ul style="list-style-type: none"> ■ Teach parliamentary procedure in simplified chunks, starting with mastering the basics.

¹¹ Defaults: Automatically enroll people in certain programs

¹² Simplification: Reduce confusion for complex programs and choices

	Classroom Instruction	School Demonstration Farm	Home Entrepreneurship Projects	Leadership Development
Uses of social norms ¹³	<ul style="list-style-type: none"> ■ Create WhatsApp agriculture teachers' group for communication. ■ Send out tip of the week via WhatsApp. ■ Create a Facebook agriculture teachers' group for communication. ■ Establish a teacher-led "Agriculture Teachers Association" as a community of practice for professional development with regular meetings. 	<ul style="list-style-type: none"> ■ Encourage participation of parents at agriculture training on the school farm: "Everyone is doing it". ■ Encourage the chief/local government representative to promote the school farm. ■ Encourage participation from the Ministry of Agriculture and Ministry of Education. ■ Sponsor a quiz bowl in front of the entire community where students can demonstrate their agricultural knowledge to parents and farmers. 	<ul style="list-style-type: none"> ■ Ensure all members of the agricultural student organization have home projects: "This is what members do around the world." ■ Organize home project alongside football matches. 	<ul style="list-style-type: none"> ■ Encourage positive peer pressure: "Everyone is joining the agricultural student organization." "Everyone is participating on the school farm." ■ Set up meetings of like-minded youth from nearby towns who are participating in the agricultural student organization. ■ Invite guest speakers to meetings of the agricultural student organization. ■ Use dramas and songs to illustrate the importance of agriculture. Develop these into competitions. ■ Promote agricultural student organizations, such as 4-H, as a national and global organization: "Students from around the world are joining."

¹³ Use of social norms: Inform others that most people are engaged in specific behaviors

	Classroom Instruction	School Demonstration Farm	Home Entrepreneurship Projects	Leadership Development
Increases in ease and convenience¹⁴	<ul style="list-style-type: none"> ■ Use experiential teaching methods more often than class lectures. ■ Host teacher trainings at a convenient and strategic time of year. Remove barriers to participation. ■ Create ready-to-use lesson plans and activities. ■ Align teacher trainings with local curriculum to make it relevant. 	<ul style="list-style-type: none"> ■ Agriculture teacher trains farmers during Farmer Field Day at school in conjunction with an appropriate holiday or celebration. ■ Display best practices through community fairs and exhibitions. ■ Distribute 4-H Manual on how to start a school farm, including the improved methods taught at the agriculture innovation training (agronomic curriculum). ■ Create simple record-keeping templates for school farm. 	<ul style="list-style-type: none"> ■ Host local agriculture competitions and invite local parents and farmers in order to diffuse knowledge. ■ Create simple record-keeping templates that agriculture teacher can aggregate and submit to the national organization. ■ Establish home projects on frequently used paths, near the home or in town, so parents and other farmers can see the new methods. 	<ul style="list-style-type: none"> ■ Host leadership and speaking competitions at the school to make it easy for more students to participate. ■ Provide manuals with leadership activities and directions. ■ Distribute agricultural student organization manual to all clubs overviewing the basics of parliamentary procedure for club meetings.
Disclosures, promotions & warnings¹⁵	<ul style="list-style-type: none"> ■ Display posters in the classroom that remind the teacher of the experiential learning model: do, reflect, teach, apply. 	<ul style="list-style-type: none"> ■ Display chemical application posters warning of the dangers of improper use. ■ Display livestock and garden safety posters. ■ Disclose to parents the positive impact of the program on students. 	<ul style="list-style-type: none"> ■ Design and distribute poster of livestock or garden safety rules to take home. ■ Design and distribute posters of star youth farmers in the country. ■ Design and distribute poster explaining home projects. ■ Set up opportunities for students to go on local radio to talk about their home projects. 	<ul style="list-style-type: none"> ■ Display posters of women in agriculture. ■ Display posters of successful farmers from around the world wearing suits and big smiles, each one saying "I am a proud farmer".

¹⁴ Increases in ease and convenience: Make the right choice easy and "in-your-face"

¹⁵ Disclosures, promotions & warnings: Disclose, promote or warn people of the positive and negative consequences of their actions or inactions

	Classroom Instruction	School Demonstration Farm	Home Entrepreneurship Projects	Leadership Development
Incentives ¹⁶	<ul style="list-style-type: none"> ■ Present certificates to teachers at training. ■ Encourage universities and government to certify teacher training. ■ Request the use of official logos from government or academic institutions on teacher certificates. ■ Recognize successful teachers throughout the year through various media: social media, radio, etc. ■ Create hype and excitement for teachers to participate in SBAE. Brand SBAE as the very best the country has to offer. When teachers state with pride, "I'm a certified SBAE instructor," it creates prestige. 	<ul style="list-style-type: none"> ■ Recognize successful adult farmers with an Honorary SBAE Farmer Degree. ■ Pay the hardest working students on the school farm or reward them with scholarships to high school/ university. ■ Participate in Farmers' Day competitions to incentivize hard work. ■ Host school farm competitions: agriculture fair or garden-bed competition. The desire to win is a great incentive. ■ Ensure students lead and organize the school farm while the agriculture teacher advises. It is not child labor; it is their co-operative. ■ Establish a point system for school farm participation and reward the top earners of points. 	<ul style="list-style-type: none"> ■ Incentivize learning through earning money. ■ Incentivize home projects through competitions and the desire to win. ■ Recognize high achievers in front of the entire community. ■ Reward top home projects with an opportunity to travel, possibly to the national fair or leadership camp. ■ Reward successful home projects with agricultural inputs, soccer balls, etc. 	<ul style="list-style-type: none"> ■ Set up leadership competitions: Agriculture Creed competition, parliamentary procedure competition and debate. Competitions create incentives to work hard and win. ■ Involve college students in SBAE activities – young people like being around "cool" college-aged students. ■ Set up a point system for attendance in agricultural student organization meetings and reward top earners. ■ Allow students to run their own meetings and determine how to spend proceeds from the school farm. This creates agency and acts as an important incentive. ■ Present certificates to students who achieve certain degrees in farming: First Year Member, Club Farmer, National Farmer.

¹⁶ Incentives: Incentivize good behaviors

	Classroom Instruction	School Demonstration Farm	Home Entrepreneurship Projects	Leadership Development
Pre-commitment strategies¹⁷	<ul style="list-style-type: none"> Teachers agree to hold each other accountable after training. Teachers pre-commit to use experiential learning techniques before they leave the training by signing a compact. Photograph teachers at training in front of a sign that says, "I will be a caring agriculture teacher," to hang in their classrooms. 	<ul style="list-style-type: none"> Students discuss, vote and set their own plans for the school farm. Parents sign an agreement letter with SBAE officials, committing them to participate and support the students. Students set school farm milestones to be achieved for the year. 	<ul style="list-style-type: none"> Students develop a business plan for their home projects. Students set milestones to be achieved during the year in their home projects. Students take a field trip to a local successful farm and develop a set of personal strategies needed to achieve that level of agricultural success. 	<ul style="list-style-type: none"> Host goal-setting workshops during agricultural student organization meetings. Establish agenda-setting activities at the beginning of the year for individual clubs, field officers and national staff. Create club milestones to be achieved for the year at the first meeting of the year.
Reminders¹⁸	<ul style="list-style-type: none"> Set up Field officer supervision every two weeks. Write letters to students and teachers. Send reminders to teachers about upcoming events, record book deadlines, experiential learning techniques, and other SBAE activities, using SMS text, phone calls and WhatsApp. Follow up with teachers after training for encouragement and troubleshooting. 	<ul style="list-style-type: none"> Field officers supervise teachers every two weeks to remind teachers what they learned at training. Post work schedule for students on the farm to remind them when they signed up to work. 	<ul style="list-style-type: none"> Teacher supervises home projects every two weeks to remind students what they learned in SBAE. 	<ul style="list-style-type: none"> Club officers should remind members of upcoming events at the end of every meeting.

¹⁷ Pre-commitment strategies: Set pre-commitments to deliberate actions and increase the likelihood of achieving that action

¹⁸ Reminders: Do not let people forget

	Classroom Instruction	School Demonstration Farm	Home Entrepreneurship Projects	Leadership Development
Provide feedback ¹⁹	<ul style="list-style-type: none"> Ask agriculture teachers to show interest and provide constructive feedback to students. 	<ul style="list-style-type: none"> Make experimental data transparent – set up a public-record board that monitors progress in front of the school farm, especially in side-by-side field trials. 	<ul style="list-style-type: none"> Record keeping provides the best feedback on the success of a project. Making or losing money from a school or home project is the ultimate form of feedback. Students submit weekly home 	<ul style="list-style-type: none"> Gather comments from community or government representatives and leaders who observe workshops or other school events.

¹⁹ Provide feedback: Inform people of their past choices



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