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An Innovative Model of Agricultural Education and Training in Guinea: Trending Toward Self-Sustainability

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Abstract

Exploring locally-designed Agricultural Education and Training (AET) programs provides opportunities for the entire system of AET to improve. Recognizing this potential, researchers conducted a case study of the Centre d'Apprentissage et de Formation Professionnelle Post-Primaire (i.e., Center for Post Primary Professional Training [CAFPPP]) located in Macenta, Guinea. The case study was completed in conjunction with a comprehensive program review and participant-engaged strategic planning process. Results illuminate CAFPPP faces significant challenges, including (a) limited funding, (b) insufficient teacher and administrator training, (c) limited curricular scope, and (d) systematic challenges. Additionally, three critical strengths were identified at CAFPPP, (a) utilization of an effective, practice-based educational model, (b) stakeholder support, and (c) access to fertile agricultural land. Considering both strengths and weaknesses, researchers and CAFPPP stakeholders co-created a model to propel CAFPPP toward its stated goal of becoming an "autonomous center of excellence." The dynamic model envisions a school leveraging its strengths to systematically address identified weaknesses via intersecting approaches to funding, teacher and administrator development, and graduate support. Presentation of the model is supplemented with a discussion of, and recommendations for, application of the model at CAFPPP. Furthermore, opportunities for all AET programs to reflect upon, and evaluate, current strategies in light of the proposed model are discussed.

Keywords: agricultural education and training, Guinea, international development, practice-based education, self-sustainability

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Introduction and Review of Literature

Exploring agricultural education and training (AET) models established to address local needs provides a rich opportunity to identify innovative and potentially replicable systems to prepare individuals to contribute to the growth and sustainability of agriculture. One such model is the *Centre d'Apprentissage et de Formation Professionnelle Post-Primaire* (i.e., Center for Post Primary Professional Training; henceforth referred to as CAFPPP), which offers students who were unsuccessful in traditional schooling, skills-based training in agriculture. The educational system developed at CAFPPP uniquely addresses challenges common throughout sub-Saharan Africa and the world; thus, critical analysis of this educational model increases awareness of educational approaches which could holistically increase the quality of AET.

CAFPPP is located in Macenta, a town in southeastern Guinea, a country found on the western coast of Africa. Guinea gained independence from France in 1958. In 2010, Guinea participated in its first democratic election in which current president Alpha Conde was elected. Within Guinea, 42% of the population are individuals 14 years of age or younger, and the total population is expected to increase by 42.5 million before the end of 2020 (Bloom, 2011; Proctor & Lucchesi, 2012). The Guinean economy also continues to expand; consequently, many Guineans report increased quality of life, including more substantive social roles for women, due to increased access to agricultural goods and services (USAID, 2015).

Agriculture in Guinea

Agriculture plays an essential role in Guinea, as 80% of the working population is employed in agriculture (Ouraich, Lowenberg-DeBoer, Soumah, & Diallo, 2017). Further, agriculture is the fastest growing sector of the economy and is anticipated to be critical to sustainably employing the increasing population (Filmer & Fox, 2014). In fact, employers expect positions requiring postsecondary training in agriculture to double by 2020 (Ouraich et al., 2017). Without question, agriculture has been the key to economic growth in Guinea and will continue to play a leading role in its continued development. According to the USAID (2015), the most common products of Macenta are field crops (i.e., most common are rice, coffee, and maize), small livestock (i.e., most common are goats, chickens, and ducks), forest products (i.e., most common are bush meat, Raphia wood, and tree bark), garden crops (i.e., most common are sweet potato, okra, and cassava), and aquaculture (i.e., most common are tilapia and catfish).

While agriculture is critical to the growth of Guinea, it is not without challenges. Among the challenges is the marginalized role of women; as USAID states, "women in Guinea play a substantial, but usually unrecognized and unsupported, role in agriculture" (2015, p. 5). The lack of support for women in agriculture stems from traditional social norms, with farm systems being controlled by males, who traditionally manage production, while females traditionally manage sales (USAID, 2015). However, the forest region of Guinea, in which Macenta is located, boasts the highest proportion of female-managed farming systems; yet, much less than the number of male-managed systems (USAID, 2015). The limited capacity and support for women in agriculture reduces the decision making autonomy of females and is a critical barrier to continued growth of Guinean agriculture. Additional challenges among Guinean agricultural producers include the increasing risk of desertification brought about by

climate change and migration of labor (USAID, 2015).

Agricultural Education and Training System in Guinea

The AET system in Guinea is comprised of three categories of schools, (a) one public, agricultural university, (b) five public, certificate-level institutes, and (c) vocational training centers, like CAFPPP (Ouraich et al., 2017). The one public agricultural university is the Institute for Agricultural and Veterinary Science, located in Faranah, which provides four-year degree programs in agronomy, agroforestry, rural economy, water, forestry, animal science, engineering, and extension. The public institutions for agriculture and livestock production (i.e., ENAE), located in Macenta, Tolo, Koba, and Kankan, and water and forestry techniques (i.e., ENATEF), located in Mamou, offer three-year certificate programs (USAID, 2015). CAFPPP, which falls under the classification of a vocational training facility, provides students with a one or two-year program in either vegetable production, coffee nursery, or poultry production.

Currently, a gap exists between the AET provided in Guinea and the skills desired among employers (i.e., work experience, communication skills), an issue common to sub-Saharan Africa (Blackie, Mutema, & Ward, 2009; Breazeale, Mangheni, Erbaugh, & Mbowa, 2014; Ouraich et al., 2017; Scheltema, Meyer, Ejobi, Tinga, & Tschirley, 2014). The gap in AET training and employer needs results in up to 80% of postsecondary graduates unsuccessful in gaining employment after graduation, many remaining unemployed in formal agricultural positions up to eight years after graduation (Al-Samarrai & Bennell, 2007; Azoh, Weyer, & Carton, 2012; Ouraich et al., 2017). The challenges new graduates experience finding jobs are exacerbated for females or individuals who received training from a vocational school, like CAFPPP, as opposed to the agricultural university (Ouraich et al., 2017). To address the disconnect between AET and agricultural careers, recommendations have been made to increase the use of internships and field trips to better prepare students for careers in agriculture (Adebo & Sekumade, 2013).

The AET system in Guinea offers tremendous opportunities to evaluate models which are evolving to address challenges present in Guinea and elsewhere; yet, little known research has been conducted to elucidate Guinean AET institutions. The current case study focusses on describing the vocational training center CAFPPP. Such analysis provides an opportunity to evaluate the current AET approach at CAFPPP as well as the future potential to address the challenges of the region. Furthermore, explication and evaluation of the CAFPPP model offers similar programs, or regions who experience similar challenges, a starting point for educating individuals to contribute to the growth and sustainability of agriculture.

Conceptual Framework

As opposed to a conceptual model for AET in developing regions, authors sought a conceptual framework addressing human and organizational development. Operationalizing a *development* model for this case study provided a lens which elevated the idea of a dynamic system over one that is static. Furthermore, a lens of development better addressed the aim of this case study, to pair evaluation with strategic planning to help CAFPPP address current and future challenges.

Within human and organizational development models, training-based perspectives, which focus on developing participant skills and knowledge, have

traditionally dominated the landscape. Recognizing an opportunity to expand traditional thinking, USAID (2010) developed the Human and Institutional Capacity Development (HICD) model. The model was developed to better address the spectrum of capacities which incite organizational success, including access to information, availability of resources and tools, utilization of financial and non-financial incentives, development of individual knowledge and skills, increased capacity for all members of an organization, and alignment of member and organizational motivation (Chevalier, 2003). In practice, the HICD model includes the following process: 1) Identify partner organizations; 2) Obtain partner commitment; 3) Form stakeholder groups; 4) Conduct performance assessment; 5) Prepare performance solutions package; 6) Implement performance solutions; and 7) Monitor change in performance.

Feedback from monitoring changes in performance (i.e., step seven) spurs continuous performance assessments (i.e., step four) and the preparation of performance solutions (i.e., step five); thus, creating a cyclical and dynamic process of HICD. The HICD framework is grounded in three principles, (a) organizations are adaptive systems, (b) organizational performance must be viewed systematically, and (c) measureable performance results are the focus. Not only does the HICD model provide a foundation for considering the development of dynamic AET systems, the HICD model provides a process which encourages scholar-practitioners to engage all members of AET systems in the evaluation, planning, and execution of strategies to contribute to the growth and sustainability of agriculture within their region. Given the strengths of this model, it was used in the collection, analysis, and presentation of the current case study.

Purpose and Objectives

The overall aim of this study was to help CAFPPP identify and address the current and future challenges of the region, including the challenge of self-sustainability. Therefore, the purpose of this case study was to describe in detail the situation, challenges, and opportunities for self-sustainability related to CAFPPP. To accomplish this purpose, three research objectives guided the work: 1) Identify challenges to self-sustainability within CAFPPP; 2) Identify leverage points to self-sustainability that currently exist within CAFPPP; and 3) Describe a participant-created model for self-sustainability at CAFPPP.

Methods

The current study operationalized a case study design (Gall, Gall, & Borg, 2003) to uncover the situation (e.g., challenges, leverage points) at CAFPPP. A case study approach was used because it enabled the researchers to closely examine the data within the specific context of CAFPPP and the individuals directly involved in the operation of the school. Therefore, an exploration of the processes, activities, people, and other factors related to the operation of the school were explored. Data were collected for this case study as part of a comprehensive institutional assessment and strategic planning process.

Context and Participants

The study was carried out at CAFPPP in Macenta, Guinea, an agricultural training center created by the Guinean government in 2009 with a goal to strengthen youth employability by providing skills training in agriculture. Macenta and the surrounding towns rely heavily on agricultural production; thus, most people in the region farm. Annual enrollment at CAFPPP fluctuates greatly; recent

enrollment numbers have ranged from 55 to 217 students. The school is managed by five administrators and ten teachers. The administration includes the managing director, director in charge of studies and curriculum, chief of operations, student advisor and counselor, and administrative assistant in charge of finance and administration. The teachers are all local farmers recruited by the school administration to work as partners in training students. A partnership also exists between local farmer organizations (e.g., rice producers, banana producers) which assist in an advisory role, but also take an active role in the recruitment of students and teachers. CAFPPP is financed in part by the Guinean government, but the school also raises money through production of eggs, nursery plants, and vegetables. CAFPPP has limited infrastructure, operating with only two classrooms, a nursery plot, and a chicken coop. CAFPPP infrastructure is owned by the National School of Agriculture and Livestock Management (ENAE) but shared with CAFPPP, which enables them to operate.

Participants of the study were selected by the administration to take part in the strategic planning activities. The sample consisted of 21 participants (female = 5; male = 16), including administrators (2 female; 2 male), teachers (7 male), representatives of local farmer organizations (1 female, 5 male), and students (2 female; 2 male). Participants from the farmer organizations represented various agricultural commodities including bananas, rice, poultry, fish, and diversified livestock. All of the school administrators, except the chief of operations, participated in the case study. Students participating consisted of two students currently enrolled and two students who had recently graduated from CAFPPP.

Data Collection and Analysis

Data were collected using five methods: (a) observations of school infrastructure, teaching, and offsite training facilities, (b) structured written survey responses, (c) one-on-one semi-structured interviews, (d) semi-structured focus-group interviews, and (e) participative inquiry. Data were collected over the course of seven days during the summer of 2017.

Observations enabled researchers to collect data about school infrastructure, teaching, and offsite training facilities. Researchers toured CAFPPP facilities (i.e., classrooms, nursery, chicken facilities, horticulture gardens) as well as offsite training facilities (e.g., poultry, swine, rabbit, tilapia, corn, and rice) that provide student work experiences. Researchers created a written summary for each tour and kept observation notes throughout the data collection process.

Structured written surveys were distributed to individual administrators, teachers, students, and representatives of farmer organizations. Surveys sought participant feedback on the strengths, weaknesses, opportunities, and threats at CAFPPP. Additionally, stakeholder groups completed structured group surveys, answering focused questions elucidating specific knowledge of CAFPPP and Macenta (e.g., What crops are grown in Macenta? What is the graduation percentage of CAFPPP? What does a typical student day look like?).

One-on-one semi-structured interviews were conducted with selected administrators, exploring topics of land use, leadership skills among administrative staff, teacher development, assessment methods, and the future goals for CAFPPP. A semi-structured interview was also conducted with one teacher, a Macenta farmer, analyzing his experiences as an educator at

CAFPPP. The individual interviews lasted between 30 minutes and one hour.

Semi-structured focus group interviews with administrators, teachers, students, and representatives from farmer organizations were conducted. Researchers met with each group separately, exploring their experiences and perceptions of CAFPPP. The interviews consisted of questions addressing various topics about CAFPPP and lasted for one hour each. Broad questions were asked with follow-up questions to elicit more details (Denzin & Lincoln, 2011).

Participative action inquiry is a form of participatory action research, a qualitative research method in which the participants concern themselves with the development of an action plan to transform their organization towards greater effectiveness (Chevalier & Buckles, 2013; Kemmis & McTaggart, 2000). This case study employed participative action inquiry as a way to gather information from participants about perceived strengths, weaknesses, and goals for improvement at CAFPPP. With facilitation from the researchers, participants engaged in multiple activities including brainstorming and small and large group discussions to develop lists of strengths, weaknesses, and strategies for identified challenges at CAFPPP. Additionally, participants engaged in identifying a timeline and responsible individual(s), and engaged in developing action plans for each of the developed strategies. Finally, participants engaged in a collaborative discussion of the mission, vision, and core values of CAFPPP.

Both researchers collected data and kept reflective journals. Participants spoke French while the researchers spoke English, so data collection funneled through a French-English interpreter. Data gathered from the participants were transcribed into English before being analyzed. Because quotes collected from participants were translated, the quotes represented in this manuscript may not be an exact representation of the contributors' ideas. Researchers employed the constant comparative technique throughout the research process to develop categories and themes. Data were sorted and grouped, enabling the researchers to interpret and reflect on emerging patterns and regularities (Corbin & Strauss, 2008). Researchers utilized the emerging themes and categories to guide the one-on-one and focus group interviews. Themes and categories were also shared with participants (i.e., peer debriefing) enabling participative action inquiry to occur. Through this process, a deeper understanding of the case was achieved and credibility was established. Trustworthiness and credibility were achieved through peer debriefing, the use of reflective journals, participant action inquiry, and triangulation at various stages and from multiple data sources (Denzin & Lincoln, 2011).

Subjectivity Statement

A subjectivity statement is provided so related experiences and beliefs of the researchers may be transparent to the reader. Both researchers in this study are White, middle-class males who live in the United States and who are both employed by land-grant institutions as teacher educators in the field of agriculture, food, and natural resources (AFNR) education. As such, both are directly involved in the process of training students for careers in AFNR and AFNR education. Researchers have conducted, presented, and published research studies on topics related to vocational and career training of students, teacher development, leadership, teacher attrition, and the system of school-based AFNR education. Prior to becoming teacher educators and researchers, authors taught

AFNR in public schools at the secondary school level for a combined total of nine years. Researchers acknowledge previous experience teaching high school AFNR, which involved running profitable school-based enterprises, managing facilities, equipment, and personnel, and facilitating the instruction and job placements of students, has shaped beliefs and views about vocational AFNR training programs and influenced how data were collected and analyzed.

Findings and Discussion

The purpose of this case study was to evaluate the current system of education at CAFPPP and a path to self-sustainability. To accomplish this objective, current challenges, strengths, as well as a participant-created model of self-sustainability will be described.

Challenges to Self-Sustainability

The first step in considering the potential self-sustainability of CAFPPP is to acknowledge and evaluate the challenges faced by the school. For discussion, the challenges faced by CAFPPP have been concatenated into four themes: (a) funding, (b) skills and training, (c) curriculum, and (d) systematic challenges. To elucidate the four themes, each will be explored, including an analysis of current and future consequences of specific challenges.

Funding. The first challenge to self-sustainability is a lack of financial resources. The lack of resources has led to immediate consequences for the students and community served by CAFPPP. These immediate consequences include lack of accessible farming equipment, medical facilities, and technology which limit the learning potential and safety of the school. Furthermore, inadequate compensation creates tension among teachers who believe in the mission of CAFPPP but struggle to meet basic needs for themselves and their families; as the teachers shared, *"for us to remain in the teaching process, we need a salary increase."* In addition to immediate consequences, the lack of funding is a major limitation to the future growth and expansion of CAFPPP. Specifically, limited resources have restricted the administration from making strategic investments in new programs (e.g., pork and aquaculture) and the entrepreneurial ambitions of recent graduates, each of which could increase student numbers and community (i.e., current producers and alumni) support for CAFPPP.

Skills and training. The second challenge to self-sustainability is a lack of skills and training among CAFPP administrators and teachers. Administrators were placed in their positions without the education or training in specific skills necessary for the success of the school; as the administrators shared, *"we need training in computers, grant proposals, marketing agricultural goods, and pedagogy…only two [administrators] have received any training."* Training efforts (e.g., hosted by organizations like Winrock International) provide support in critical areas; however, trainings are reactive and temporary as opposed to proactive and sustainable. The lack of training is also visible among teachers, hired due to their community-recognized proficiency in agriculture, who lack formal pedagogy training. In total, the lack of skills and training among administrators and faculty yields a culture of focus on addressing daily challenges as opposed to strategic planning, networking, and resource acquisition.

Curriculum. The third challenge to self-sustainability is the curriculum taught at CAFPPP. The curriculum lacks distinction from ENAE Macenta, a certificate-level institution that shares facilities and land with CAFPPP. Program overlap would be

understandable if the scope of agricultural production was limited; however, representatives of farmer organizations stated "*in Macenta, farmers produce many, many things,*" providing a context for both CAFPPP and ENAE to provide education and training in unique areas of agriculture. While program overlap has some advantages (e.g., shared resources, pooled knowledge), unique programs at CAFPPP would empower graduates to find employment or start new enterprises without being in direct competition with ENAE graduates, who have received more training.

Systematic. The fourth set of challenges are due to the cultural and educational systems at CAFPPP and in Guinea. These challenges include a lack of written contracts between CAFPPP teachers and administrators, weakening the leverage of teaching faculty to spur change. Additionally, the land utilized by CAFPPP is owned by ENAE and CAFPPP lacks a formal agreement ensuring the continued use of these resources. Among students and teachers, however, the most commonly recognized challenge is the distance between the school and city center (i.e., four km), requiring significant time and energy to travel to and from CAFPPP. As the teachers shared, "*when it rains, many students do not attend class because of the walk.*" The arduous travel is further complicated by extremely poor conditions on the road linking CAFPPP and the city. These systematic issues support a static culture of challenge whereas a dynamic culture of growth and optimism is needed for CAFPPP to become self-sustainable.

Leverage Points to Self-Sustainability

The significant challenges faced by CAFPPP illuminate the question, "how?" Specifically, how can a school facing so many obstacles emerge as a self-sustainable model of AET? To begin answering this question, we must explore the strengths (i.e., leverage points) currently present at CAFPPP. As these strengths are explored, the groundwork will be laid for how the current strengths can be leveraged to overcome the challenges faced by CAFPPP and redirect the school toward a self-sustaining future.

Practice-based education. The first theme of strengths within CAFPPP is the educational approach, which was described as "*80% practical, 20% theoretical*" by CAFPPP administrators and teachers. The practice-based (i.e., hands-on, in the field) model is appropriate given the mission of the school to provide students with *skills* necessary for employment. Evidence also emerged of the efficacy of this approach, as one of the producers in the region shared, "*students graduate ready to work on my farm*." Equally important, the educational model addresses an important community problem. Previously, CAFPPP students had few educational options and would, therefore, struggle to contribute to the growth of their community. Being positioned to directly address a community need has fostered tremendous support from numerous stakeholders throughout Macenta and the surrounding region.

Stakeholder support. Support for CAFPPP is a strength critical to the self-sustainability of the school. Internally, support is evident in the enthusiasm teachers and administrators express for the work of the school. Externally, support for CAFPPP begins with ENAE, which has provided land, resources, and classrooms to accommodate CAFPPP student learning. Additionally, farmer organizations have continually supported the work of the school, evident in the six organizations represented during the program review and strategic planning. Importantly, local farmers do not see CAFP graduates as potential competitors; instead, representatives of farmer organizations

believed in *"solidarity,"* representing their ideology of, "*when my neighbor succeeds, I succeed.*" The community need-based model employed at CAFPPP has also engendered support from local political leaders, who expressed consistent enthusiasm and appreciation for the work being done at the school. Lastly, CAFPPP has received financial and training support from international organizations, like Winrock International and the World Bank, which have proven essential to building a foundation for potential self-sustainability.

Production agriculture potential. The third, and final strength essential to the self-sustainability of CAFPPP is the agricultural production and resources available to the school. The climate of Macenta (i.e., moderate temperatures and adequate rainfall) provides an abundance of high-quality, fertile land available for production, accentuated by a river flowing through CAFPPP land, allowing for off-season, irrigated production. Not only is the potential for supplying agricultural products evident, school administrators, teachers, and local farmers indicated high demand for products grown at CAFPPP. As an administrator shared, "*we could sell more than ten times the coffee nursery, horticulture, and poultry produced at CAFPPP.*"

Model of Self-Sustainability

Collectively, authors and CAFPPP stakeholders envisioned an educational model which could achieve a collective goal for CAFPPP to *"become an autonomous center, a center of excellence."* The concept "autonomous" has been renamed "self-sustaining" and is conceptualized as an AET system operating to address identified goals without external financial or administrative support. The model (see Figure 1) of self-sustainability leverages the three identified strengths of CAFPPP (i.e., stakeholder support, production agriculture potential, and practice-based education), indicated by a gray background, to address identified challenges.

Faculty and staff training cycle. On the left side of the model, a process for addressing the limited skills and training of CAFPP faculty and staff is provided. The cycle starts by pairing CAFPPP faculty and staff with mentoring faculty and staff at ENAE who have received training and education in teaching and school administration. This mentoring relationship will yield faculty and staff development, which will support the use of practice-based education. Additionally, the cycle includes "reflective practitioners," highlighting the opportunity for CAFPPP teachers and administrators to reflect on their own experiences and share with fellow teachers and administrators at CAFPPP and at ENAE practices found to be effective. This process requires utilization of the critical stakeholder support found at ENAE as well as the self-motivation of CAFPPP faculty and staff to better meet the needs of their students.

Program funding cycle. On the right side of the model, a process for addressing the limited program funding is provided. The cycle starts by leveraging the productive agricultural ground available to CAFPP as well as the high demand for CAFPPP products. Using these leverage points, existing programs (i.e., chicken, vegetable, and coffee nursery) should be expanded. In so doing, opportunities for practice-based learning among CAFPPP students are expanded (e.g., instead of all students tending one coffee nursery, small teams of students could manage their own coffee nurseries). The outcome of expanded production will be an increase in school revenue, which will empower administrators to make strategic investments, including expanding and adding production programs to match the diversity of agriculture in

Macenta, investments in the entrepreneurial ambitions of CAFPPP graduates, and supporting the livelihood of current CAFPPP teachers, ensuring their continued role at CAFPPP. As a long-term goal, the funding cycle described could be leveraged to purchase CAFPPP-owned land, increasing their self-sustainability as a school.

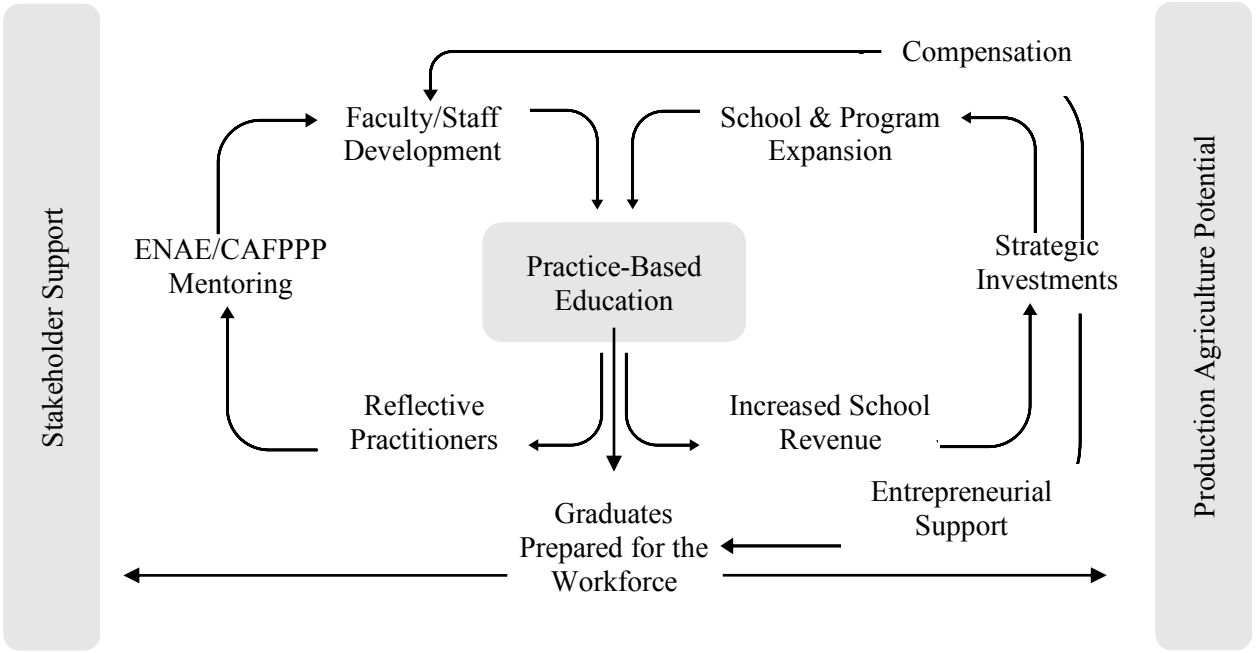

Figure 1. Model of self-sustainability developed for CAFPPP Macenta.

Graduates prepared for the workforce. As noted previously, the practice-based education utilized at CAFPPP yields graduates prepared for the workforce. This relationship is included within the proposed model of self-sustainability at CAFPPP. Additionally, the model recognizes graduates of CAFPPP are a tremendous source of continued stakeholder support; specifically, as graduates find employment, or start their own business, they can support student learning through internships, work experiences, or mentoring. Additionally, strengthening the relationship between CAFPP and graduates provides an opportunity for CAFPPP graduates to share innovative practices in agriculture, which could be implemented at CAFPPP.

Conclusions and Recommendations

Research on the system of AET at schools, like CAFPPP, opens an opportunity to evaluate, modify, and replicate unique educational approaches throughout AET. Operating since 2009, CAFPPP faces a number of challenges, including limited funding, lack of skills and training among administrators and teachers, a curriculum limited in scope, and additional systematic challenges. In the face of these obstacles, CAFPPP has evolved into a program with strengths supporting the education of students in Macenta, including an effective,

practice-based educational approach; tremendous stakeholder support; and opportunities for expansion via large demand for agricultural products and available, fertile land. Working collaboratively, researchers and CAFPPP stakeholders (i.e., administrators, teachers, students, and representatives of local farmer organizations) envisioned a model to help CAFPPP meet their goal to "*become an autonomous center, a center of excellence."*

Before discussing the findings and proposed model, however, a discussion of the research limitations is needed. First, participants in the research did not represent the entire stakeholder group at CAFPPP; therefore, the perspectives and experiences are limited to participants. Second, the information shared by participants was communicated in French and had to be translated into English, introducing potential bias or errors due to translation. Finally, data were gathered over seven days. Researchers acknowledge their inability to fully immerse themselves within the case in such a short time frame. However, the research presented is a first glimpse into CAFPPP Macenta and should, therefore, be interpreted as a foundation for which additional knowledge, practices, and research can be built.

The process described within the case study provides a valuable opportunity to reflect upon the Human and International Capacity Development (HICD) model (USAID, 2010). In fact, the first five steps of the HICD model are evident, by design, in the work described in this study (see Table 1). The remaining components (i.e., implement performance solutions and monitor change in performance) await implementation and evaluation of the solutions package via the model of self-sustainability.

The AET system in Guinea is facing an impending challenge to train an influx of youth to fill an agricultural workforce expected to grow in congruence with the population (Bloom, 2011; Filmer & Fox, 2014; Proctor & Lucchesi, 2012). Awareness of this expansion suggests self-sustaining educational systems, as opposed to government-dependent systems, provide a more responsive system of AET. Therefore, the model of self-sustainability illuminated in the current study, while developed specifically for CAFPPP, could be operationalized as a starting point for developing self-sustaining AET schools throughout Guinea. The question then becomes, where does a community start in implementing this model? From a replication standpoint, ensuring the three strengths (i.e., stakeholder support, practice-based education, and production agriculture potential) is a critical first step. Importantly, these critical pillars of a self-sustaining educational system, using this model, influence (a) transparent selection of who is involved in the establishment of a school to increase broad community support, (b) the development of curriculum grounded in practice, and (c) locating the school for maximum agricultural production and, if possible, near a source of teacher and administrator mentoring.

Table 1

Comparison of HICD Model and CAFPPP Case Study

HICD Model[1] Components	CAFPPP Case Study
Identify partner organizations.	Representation from local farmer organizations present during the case study.
Obtain partner commitment.	Participation in the case study by administrators, teachers, students, and local farmer organizations.
Form stakeholder groups.	Focus groups and discussions facilitated among administrators, teachers, students, and local farmer organizations.
Conduct performance assessment.	Identification of strengths and weaknesses at CAFPPP.
Prepare performance solutions package.	Co-development of a self-sustaining model of AET at CAFPPP.
Implement performance solutions.	Dependent on application of self-sustaining model.
Monitor change in performance.	Evaluation dependent on application of self-sustaining model.

[1]USAID, 2010

In addition to the implementation of the model, pragmatic recommendations emerged for programs similar to CAFPPP regarding the operation of the school. First, schools must conduct transparent practices related to the operations of the school; especially when attempting to engender external community support. Second, schools must engage in shared decision making, ensuring the voices of students, teachers, local stakeholders, and administrators are valued throughout the process; especially when attempting to engender internal support. To facilitate this transparency and shared decision making, regularly scheduled opportunities for stakeholders to come together is highly recommended. Third, given the hiring preference for university-trained students, practice-based educational institutions like CAFPPP, should train students in skills different from curriculum at the university level. A tremendous opportunity for differentiation is value-added agriculture (e.g., canning, food preservation, service, sales).

The foundation of knowledge gleaned from this case study opens the door for research to build the scope of knowledge regarding AET in CAFPPP, Guinea, Africa, and globally. First, and foremost, research is recommended to follow-up with CAFPPP stakeholders to evaluate implementation of the proposed self-sustainability model. To facilitate these investigations, the remaining steps of the HICD model (USAID, 2010) provide a template for work. Furthermore, case study evaluations of similar schools (i.e., developed to address local challenges and leverage local strengths) provides opportunities for the broader AET community to learn from, and consider

applying, innovative strategies for teaching and learning agriculture. Additionally, the self-sustaining model illuminated in the current analysis provides an intervention for future AET development. Specifically, research is recommended evaluating the impact of model adoption on student learning, internal support, and community support for the school.

Any AET system is comprised of locally-adapted models which provide innovations potentially replicable within schools and programs in the broader AET system. The current study sheds light on an innovative, community-based model for AET in Macenta, Guinea. Our hope is this case study illuminates the practices, and future potential, of AET at CAFPPP as well as provides an opportunity for current and future AET programs to reflect upon, and evaluate their own approach. In order for AET to meet the myriad challenges ahead, learning from the approaches employed at peer institutions is critical.

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