

Qualitative scenario analysis of demand-driven curriculum on agricultural extension in Nigeria

Oladele Idowu Oladimeji

*Sasakawa Africa Association Ethiopia/Nigeria
Gurd Shola Area, CMC Road, Addis Ababa, Ethiopia*

Abstract

A qualitative scenario analysis of demand-driven curriculum on agricultural extension in Nigeria was performed among farmers, extension agents, input dealers, NGOs, alumni and potential students, ministry of agriculture, agricultural cooperatives, and lecturers from Universities and Colleges of Agriculture. The model of scenario analysis applied involved scenario scope, key drivers, outcomes, scenario construction, and expert consultation. The findings highlight that the key drivers and outcomes are high and low pool of school leavers for enrolment in the SAFE program, Demand Driven Curriculum (SDDC), Supervised Enterprise Project (SEP), Enterprise Centre (EC) and any forms of combination as elements of components of the SAFE program that universities are willing to adopt into the training curriculum; mid-career trainees alone, high school graduates alone, high school graduates and mid-career trainees the same class, the same curriculum different classes and high school graduates and mid-career trainees in different classes as forms of adaptation of the SAFE program and blended learning, distance learning, online platform, face to face, block teaching, weekend courses, summer programs as modes of delivery. The paper concludes the training should be packaged for the benefits of actors along the agricultural extension value-chain by establishing different forms of changes and scenarios.

Key words: training, learning, scenario-analysis, curriculum, agriculture.

Introduction

The quality of agricultural education has been identified as a major denominator to effective agricultural extension services which has been the bane of technology transfer, diffusion of innovation, innovation platforms, and innovation systems (Oladele, 2020). Agricultural education and training in sub-Saharan Africa has been depicted as dawdling in response to new patterns of demand in the era of demand-driven extension services as determined by market forces (Oladele, 2021a, 2021b). Similarly, there has been dearth of proper mechanisms for identifying emerging needs as well as for reforming curricula for agricultural education and training. This implies that the responsibilities of higher education in developing necessary skills and competencies in agricultural extension should be based on relevant curricula and mode of delivery to achieve sustainable development (Hamisul et al., 2020).

To overcome the traditional ineffective agricultural education and training approaches, in 1993 the Sasakawa Africa Fund for Extension Education's (SAFE) introduced the demand-driven curriculum model of revitalizing curriculum and pedagogy and experiential learning to the agricultural education and training landscape in Africa. According to the SAA (2018), the Sasakawa Africa Association (SAA) is an international agricultural development non-governmental organization, founded in the late 1980s by Norman Borlaug, Ryoichi Sasakawa, and Jimmy Carter, which has been working on technology transfer components with national institutions and other actors to improve smallholder farmers' productivity and profitability in sub-Saharan countries but currently focusing on four countries (Ethiopia, Nigeria, Mali, and Uganda), although the University component of Sasakawa Africa Fund for Extension Education (SAFE) covers additional countries, namely Malawi, Benin, Tanzania, Burkina Faso, and Ghana in the area of human capital development.

As the only educational strategy targeted at extension personnel, the SAFE program uses an innovative training program to upgrade the technical and human relations skills of experienced mid-career extension staff working with the Ministry of Agriculture, agricultural extension agencies and non-governmental organizations engaged in agricultural and rural development. In this program, mid-career extension workers with diploma level training in agriculture and related fields are admitted and trained for two and a half years during which they take professional courses and receive hands-on practical training designed to upgrade their skills, knowledge, and qualification.

The program is believed to prepare participants adequately to deal with complex agricultural problems. The distinguishing features of this program include: demand-driven curriculum development process through multi-stakeholder consensus on structure and contents as well as synergy between

theory and practice; partnerships among institutions and agencies involved in agricultural extension program for enhanced resource mobilization, institutionalization; monitoring and supervision of projects and ensuring the sustainability of the program; thus emphasizing trainees to be reflective practitioners and to view learning as a process not limited only to outside experts. This program has facilitated partner universities and agricultural colleges to provide in-country, demand-driven training programs (SAA, 2018).

The pillars of the SAFE's training are: lifelong learning, demand-driven curricula, student-centred experiential learning, and rural leadership development. The lifelong learning is implemented through alumni associations and network activities, demand-driven curriculum delivered through face to face, semi-distance, and open-distance learning modes; while the experiential learning and rural leadership are anchored in Supervised Enterprise Projects (SEPs) and Enterprise centres (SAA, 2020). SEPs enhance capacity development and technology transfer to the community simultaneously based on action research methodology.

Agriculture as the backbone of many economies in Africa has been touted for transformation if African countries will fulfill their economic potentials and end the continuous dependency on other regions of the world and food aid programmes. Closely associated to the maximization of these potentials is the need to ensure that agricultural innovations, knowledge, and technology are effectively disseminated to farmers and end users in sub-Saharan Africa to improve profits and livelihoods. Naibekelao (2013) stated that the SAFE programme is a product of two development imperatives in ensuring to bring African agricultural universities and colleges more fully into the agricultural and rural development process through the creation of new, innovative continuing education programs and to expand and strengthen the knowledge and skills of frontline agricultural and rural development advisory service providers to improve their capacity to more effectively serve the needs of smallholder farm families. The analysis of the future trends after 30 years of practice and adoption of SAFE methodology by 32 universities in 11 countries is important and critical due to emerging demands on agricultural extension education and services.

In Nigeria, from 2001 to 2021, the SAFE program has been adopted by nine universities with various forms of the demand-driven curriculum based on the consensus of stakeholders and provided training to mid-career extension officers in Nigeria- Ahmadu Bello University Zaria (BSc Agriculture (Extension Services), Bayero University, Kano (BSc Agricultural Extension and Community Development), Adamawa State University, Mubi (BSc. Agricultural Extension and Innovations), Usman Dan Fodio University Sokoto (BSc Agriculture (Dryland Farming Extension), and University of Ilorin (BSc Agricultural Extension and Community Development).

A major methodology for the analysis of future trends is scenario analysis. The scenario analysis is a “decision-making tool useful to assess how a situation can turn out and how different actions will affect its outcome in order for decision makers to make informed choices and especially handy in situations with high stakes and high uncertainty to establish the best-case and worst-case scenarios, and sometimes expose outcomes that might have been overlooked” (Morrisson, 2017). This kind of analysis enables management choices, strategic planning, and decision-making to be better structured for stakeholders. It is a method for predicting the possible occurrence of an object or the consequences of a situation, assuming that a phenomenon or a trend will be continued in the future (Kishita et al., 2016). It will consider and better understand how SAFE might perform under different future states such that alternatives are explored that may significantly alter the basis for “business-as-usual” assumptions.

Qualitative scenarios are decision making about uncertain and complex future exploring the plausibility of the future based on informed judgements about key drivers to guide policy making in the context of long term commitments (Wilkinson et al., 2013). Unlike more quantitative approaches, qualitative scenarios concentrate on possible future socio-economic and political conditions rather than specific technical or economic parameters (Amer et al., 2013). The application of scenario analysis is built around events that are plausible in terms of the descriptions of what, why and how it happened; distinctive with respect to different combinations of key factors and outcomes; consistent with strong internal logic; relevant by contributing to specific insights into the future and challenging by exploring alternatives to contest conventional wisdom and simplistic assumptions (Söderholm et al., 2011). The typologies of scenario analysis are reference scenarios including predictive scenarios which stress what is expected to happen; explorative scenarios which focus on what can or might happen; normative and anticipatory scenarios that pinpoint how a specific target can be reached (Balarezo and Nielsen, 2017). Other typologies are a problem-focused scenario that identifies factors for shaping future developments; actor-centric scenarios which express relationship of specific actors to events’ occurrence and a reflexive interventionist scenario that shows interactions between various actors and event occurrence (Balula and Bina, 2013).

Objective of the paper

The main objective of this paper was to conduct qualitative scenario analysis of demand-driven curriculum on agricultural extension in Nigeria.

Methodology

In this paper a qualitative scenario analysis of demand driven curriculum on agricultural extension in Nigeria was conducted by combining forecasting and backcasting approaches of scenario analysis (Bibri, 2020), such that patterns and trends from the past are identified to help make projections about likely change in the future identified through research, statistical analysis, or via formal and informal observation on SAFE and multi-stakeholder groups in SAFE works backwards from this point to identify steps needed to reach the desired future position. Omran (2019) applied qualitative development scenario planning for medical sciences education in Iran. There is no one clear methodology for the production of qualitative scenarios, and they all vary in the degree of emphasis and detail given to different aspects (MacKay and Stoyanova, 2017). Similarly, Woodman and Fitch-Roy (2020) model of scenario analysis was applied. This model includes Scenario scope (Identification of key questions to be addressed), Key drivers (Identification of the key issues which will influence the future development), Outcomes (Different outcomes produced by combinations of the key drivers), Scenario construction (Based on key outcomes, to create plausible narrative outline of possible futures) and Expert consultation (Expert consultation and advice on scenario content). In addition, a snowball sampling technique was used to select 41 farmers, 55 extension agents, 22 input dealers, 3 NGOs, 22 alumni and potential students, 3 ministry of agriculture/ cooperatives, lecturers from Universities (13) and Colleges of Agriculture (25) which gave a sample size of 184 respondents.

Results and Findings

The results of the qualitative scenario analysis of demand driven curriculum on agricultural extension in Nigeria is organised based on the stages of the model of analysis.

Scenario scope

In this section, the questions to be addressed in the scenario analysis were identified. The Sasakawa Africa Fund for Extension Education (SAFE) was established in 1991 by the Sasakawa Africa Association (SAA) with the aim of upgrading the knowledge and technical skills of mid-career extension workers in sub-Saharan Africa. The SAA realized at the very beginning of the operation of its Sasakawa Global 2000 agricultural interventions in Africa that agricultural extension staff needed professional upgrading. It was observed that

extension staff were not adequately equipped to drive the transformation of agriculture within the rapidly changing environment. Moreover, farmers' demands became more and more complex and called for the existence of well-qualified extension professionals. In Nigeria SAFE was introduced in the active days of the functional Agricultural Development Program with the responsibilities of extension services to farmers funded by the World Bank using the Training and Visit extension system. The period after the withdrawal of the World Bank support has witnessed a decreasing trend in manpower and personnel in the extension workforce. This trend has given opportunity to several National and International Non-Governmental Organizations in the provision of extension services to end-users as well as the advent of ICT given space to pluralistic extension delivery. These are the changing environment around extension workers as well as the emphasis on the policy changes in agricultural Extension. The SAFE program expanded in Nigeria from one university in 2001 to nine in 2019. Over this period several dimensions of issues and factors associated with the SAFE training were emerging from donors, beneficiaries, government policies, and future expectations of the programme.

Key drivers

This section highlights the identification of the key issues which will influence the future development. Several conditions in the extension landscape before the introduction of SAFE in Nigeria had changed, such as the low pool of mid-career extension officers, the dichotomy of Higher National Diploma and Bachelor of Science in agriculture, and a comatose Agricultural Development Program (ADP). However, the pluralistic and ICT driven extension services, emergency of private extension service providers, and current technical and soft skill gap for value chain oriented extension have stressed the need for new drivers of extension education in terms of key drivers for training and improving the competence of extension officers. The key drivers for this qualitative scenario analysis are pool of school leavers for enrolment in the SAFE program, Components of the SAFE program that universities are willing to adopt into the training curriculum; forms of adaptation of the SAFE program and mode of delivery.

Outcomes

This segment describes different outcomes produced by combinations of the key drivers. The outcomes based on the key drivers for this qualitative scenario analysis are high and low pools of school leavers for enrolment in the SAFE program, Demand Driven Curriculum (SDDC), Supervised Enterprise Project (SEP), Enterprise Centre (EC) and any forms of combination as

elements of components of the SAFE program that universities are willing to adopt into the training curriculum; Mid-career trainees alone, High school graduates alone, High school graduates and Mid-career trainees the same class, The same curriculum different classes and High school graduates and Mid-career trainees different classes as forms of adaptation of the SAFE program and Blended learning, Distance learning, Online platform, Face to Face, Block teaching, Weekend courses, Summer programs as modes of delivery. These outcomes are relative to different universities' response to the peculiarities of delivering the SAFE program in terms of their context.

Scenario construction

Based on the key outcomes, plausible narrative outlining possible futures are created as presented in Figure 1. The scenarios are based on all possible outcomes of the combinations of the key drivers and the outcomes of the combinations.

		Pool of enrolment	
		1. High	2. Low
Modes of delivery			
1. Blended learning 2. Distance learning 3. Online platform	Adaptation forms	1. High school graduates alone 2. High school graduates and Mid-career trainee Same curriculum 3. High school graduates and Mid-career trainees different classes	1. Demand Driven Curriculum (SDDC), 2. SDDC & SEP & EC 3. SDDC & EC 4. SDDC & SEP
4. Face to Face 5. Block teaching 6. Weekend courses 7. Summer programs	Adaptation forms	4. Mid-career trainees alone 5. High school graduates and Mid-career trainees the same class 6. High school graduates and Mid-career trainees different curriculum	5. Supervised Enterprise Project (SEP) alone 6. Enterprise Centre (EC) alone 7. SEP & EC
		SAFE Components	SAFE Components

Fig. 1. Scenario outcomes from analysis

Pool of enrolment

In Nigeria, there are presently 35 approved and accredited Colleges of Agriculture (17 Federal owned and 18 state owned) by National Board of Technical Education (NBTE, 2017) in Nigeria. There are equally 60 Universities with Faculties/ Colleges/ Schools of Agriculture offering agricultural extension courses in Nigeria, out of which 25 are federal, 24 are state, and 11 private universities from 170 universities in Nigeria.

It is, therefore, imperative to know that the SAFE programs have a large pool of high school leavers to draw from for the sustenance and continuity of the program. Anecdotal data stated that student enrolments for each of the Colleges of Agriculture usually admit a minimum of 150 students yearly for their programs. It, therefore, implies that on a yearly basis a minimum of 5,250 students are admitted for OND and HND degrees/ certificates out of which 75 percent will graduate after two years. It, thus, shows that there will always be a pool of school leavers to continuously feed the SAFE program annually. Also, 60 Universities with Faculties of Agriculture are equally a regular pool into which SAFE graduates/ alumni from the Colleges of Agriculture can be admitted into. The implication of this for the SAFE program is that it will encourage the expansion of the program to other Universities that are currently not part of it. This will enhance the competence of extension personnel, produce career ready graduates, guarantee the quality of the graduates, improving the overall delivery of extension services to the farmers on the long run.

Tab. 1: Proportion of Pool of Extension Professionals and Youths available for the SAFE Program

	State College of Agriculture	Federal College of Agriculture	Federal Universities of Agriculture	Faculties of Agriculture in Federal Universities	Faculties of Agriculture in State Universities	Private Universities with Faculties of Agriculture	Total
Number of institutions	18	17	3	25	24	11	98
Average enrolment rate per year	300	300	4000	200	200	250	
Average enrolment per year	5400	5100	12000	5000	4800	2750	
Male	2754	2703	5760	2650	2544	1100	35050
Female	2646	2397	6240	2350	2256	1650	17511
Average graduation rate per year	85%	85%	85%	85%	85%	95%	
Average graduation per year	4590	4335	10200	4250	4080	2475	29930

Source: Secondary data from NBTE and NUC (2018)

Mode of delivery

Face to face is the most used method of delivery (94.1%), which is followed by weekend/ sandwich teaching and block teaching (50%). However, the preferred mode of delivery among the respondents are blended learning (67%), distance learning (49.1%), summer programs (47.2%) and weekend/ sandwich courses (45.3%). Therefore, if SAFE can use distance learning, summer programs, and weekend/ sandwich modes/ methods for delivery, it will encourage more female participation and more time to train extension personnel. This will equally increase the number of extension personnel and enhance their competence in their workplaces by making them career ready. This will reduce the gap in the number of female extension agents that are presently available to work with female farmers along the value chain.

Adaptation forms

Mid-career trainees alone as a program is most currently adapted while different curriculum for mid-career trainees and high school graduates was the most preferred program by both male (53.6%) and female (48.3%). This is followed by the same curriculum for mid-career and high school graduates, male (52.9%) and female (44.8%) as adapted. This implies that if SAFE can adapt the same curriculum for the mid-career trainees and high school graduates, it will better address the holistic development of agricultural value chain, encourage more youth to develop interest in agricultural extension being hands on and practically oriented and will greatly improve the number and quality of extension agents. It is also worthy of note that mid-career trainees program is the focus of the Sasakawa African Fund for Extension Education (SAFE). Therefore, the adoption of the mid-career curriculum to train high school leavers is the right step in the right direction for improved and better agricultural extension service delivery in Nigeria.

SAFE components

A combination of supervised enterprise project (SEP), SAFE Demand Driven Curriculum (SDDC), Enterprise Centre Models (ECM) currently predominate among the partner institutions. However, respondents indicated that 65% prefer SDDC alone, 58% prefer SEP alone, 51% prefer EC alone and 40% prefer any choice of two components. This is because SEP according to Kalas and Raisinghani (2019) is community-based experience which is expected to provide experiential learning as well as linkages between the major subsystems of the agricultural knowledge system: the farmer subsystem, which

includes agribusiness, value chain oriented enterprises, the extension and education subsystem, and the research subsystem. Value Chain Studies (VCS) were approved for use in the curriculum of all Nigerian Colleges of Agriculture and Polytechnics offering agricultural courses and the value chain training is expected to lead to job and wealth creation for youths in colleges and communities. The inclusion of the Value Chain Studies (VCS) in the College curriculum has enlightened and broadened the knowledge of students on how to key into the opportunities that abound in the agricultural value chain in Nigeria, which may include, but are not limited to, processing of agricultural product, marketing, input dealers, and production, among others (The Punch Newspaper, 2017). Therefore, the SAFE program is very relevant in producing career balanced professionals (extension personnel) that are job ready for the market, agripreneurs, and self-employed through their demand driven curriculum and value chain development approach.

Expert consultation

A validation workshop helped to describe and obtain feedback through expert consultation and advice on scenario content through farmers, extension agents, input dealers, NGOs, alumni and potential students, ministry of agriculture, agricultural cooperatives, lecturers from Universities and Colleges of Agriculture. The different combinations of key drivers, outcomes, and scenarios emanating from them were perused at the validation workshop. The expert group validated that the scenarios developed from the qualitative analysis would enhance the fulfilment of the vision and mission of demand-driven training on agricultural extension and also improve the access, delivery, and impact of this training.

Conclusion

This paper has established through the stakeholders in the demand-driven curriculum training in Nigeria that exploring changes over time and space would improve the delivery, access, and enrolment of the training in response to future demands. The paper also established the different forms of changes and scenarios the training should be packaged for the benefits of actors along the agricultural extension value-chain. The paper found that there have been changing scenes of life for the demand-driven curriculum since it was first introduced in terms of emerging issues from donors, beneficiaries, government policies, and future expectations of the program. The key drivers for the changing scenarios are pool of school leavers for enrolment, components of program that universities are willing to adopt into the training curriculum;

adaptation forms and delivery modes of the SAFE program. The prominent outcomes of the scenario analysis are changing to blended mode of delivery and the adoption of any of the components by universities.

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Квалитативна анализа сценарија за курикулум пољопривредног савјетовања заснованог на потражњи у Нигерији

Oladele Idowu Oladimeji

*Sasakawa Africa Association Ethiopia/Nigeria
Gurd Shola Area, CMC Road, Addis Ababa, Ethiopia*

Сажетак

У квалитативној анализи сценарија за развој курикулума пољопривредног савјетодавства заснованог на потребама, у Нигерији учествовали су пољопривредници, савјетодавни агенти, добављачи улазних материјала, невладине организације, студенти и потенцијални студенти, министарство пољопривреде, пољопривредне задруге, предавачи са пољопривредних универзитета и колеџа. Модел за примјену анализу сценарија укључио је опсег сценарија, кључне покретаче, исходе, креирање сценарија и консултовање стручњака. У резултатима се истиче да су кључни покретачи и исходи скупине матураната који су могући кандидати за упис на *SAFE* програм, курикулум заснован на потребама (*Demand Driven Curriculum (SDDC)*), Пројекат праћеног предузетништва (*Supervised Enterprise Project (SEP)*), Центра за предузетништво (*Enterprise Center (EC)*) и било које друге комбинације елемената *SAFE* програма које су универзитети вољни да усвоје у своје наставне програме; сами кандидати са претходним искуством, сами матуранти, матуранти и кандидати са претходним искуством у истој групи, исти курикулум различите групе, матуранти и кандидати са претходним искуством у различитим групама као облици адаптације *SAFE* програма и комбинованог учења, учења на даљину, онлајн платформе, уживо, настава у блоковима, курсеви викендом, љетњи програми као облик наставе. У раду се закључује да се путем различитих промјена и сценарија обука треба прилагодити у корист учесника у ланцу вриједности пољопривредног савјетодавства.

Кључне ријечи: обука, учење, анализа сценарија, курикулум, пољопривреда.

Corresponding author: O.I. Oladele
E-mail: Oladele20002001@yahoo.com

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