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Tapping the Potential of Science, Technology and Innovation in Agri-food Chains in Africa: Creating Employment and Wealth for Youths in Africa

Winnie Alum
National Agricultural Research Organization
Uganda

Introduction

Over the last twenty years, the speed of change in the global economy has accelerated dramatically (Elshof P, 1998). There is no area in Africa's development agenda that is not affecting the youth. One of the most dynamic determinants of the path of economic growth and development is the age structure of the population and the quality of the labour force. Children and youth constitute more than 50 percent of the population of Africa, and this proportion is increasing very fast, especially when we consider the early mortality of the adult population due to the HIV/AIDS scourge. This means that more attention must be given to the youth as they are the only hope for Africa's future.

The high unemployment affecting young people is a pressing economic and social issue in both developed and developing countries alike. The ILO estimates that the 74 million young women and men who are unemployed throughout the world represent roughly two-fifths of all unemployed persons globally. In general, young people are two to three times more likely than adults to be unemployed. In many economies, the youth are particularly disadvantaged. Yet, the severity of the youth unemployment situation is understated.

An estimated 59 million young people between 15 and 17 years of age are currently engaged in hazardous forms of work and in many economies, the youth are particularly disadvantaged and of the young people who are employed, many are required to work long hours for low pay, often in the informal economy (Sachs, *et al.* - The Geography of Poverty and Wealth) questioned why some countries are stupendously rich and others horrendously poor? Social theorists have been captivated by this question since the late 18th century. As the world is trying to answer this question, the chronic poverty in sub Saharan Africa caused by factors such as unemployment, wars, ignorance and attitudinal behaviour worsens day by day, making the youth in Africa so vulnerable. This vulnerability has resulted in hopelessness for many young people in Africa as many of them give up on the struggle for improving livelihoods and start indulging in criminal activities such as theft, murder, pornography, rebel activities, misuse of drugs and violence. However, there is still hope for Africa's youth as their situation can still be rescued by promoting projects that are geared towards improving their living conditions through promotion of science, technology and innovations. These can be initiated and sustained by the youth themselves. Science and technologies that are simple to adopt to

promote food security and yet not compromise income generating activities that bring cash into the pockets of youths should be encouraged.

Critical obstacles facing the African youths in their struggle for employment and wealth creation

The youth in Africa are tirelessly struggling to come out of the chronic poverty in which they have lived since they came into existence. However, despite their struggle, their efforts are constantly being frustrated by many stumbling blocks. The fact that most people in Africa are still engaged in direct consumption or subsistence farming - local production for local consumption "you eat what you grow" will still make the young people in sub-Saharan Africa poor and unemployed. Most people seem to believe in the "hand to mouth theory" where they produce only what their families can survive on and nothing is left for sale to generate some income which could be invested in other businesses to create employment for youths in the family.

Low level of education

Due to the persistent poverty in many households in Africa, children never get to achieve good education which gives them the competitive edge to secure employment or become entrepreneurs when they grow up. This low level of education is also attributed to inability by most parents to pay tuition fees for their children so that they can reach a higher level where the qualification speaks for itself and opens doors. With the low level of education and no hope for survival, youths have been exploited as they take up any jobs that come their way. There have also been cases where they are physically and sexually abused and they do not say a word in protest because they must protect their jobs.

It is unfortunate that the sub-Saharan Africa which is inhabited by one of the world's poorest lot has semi-arid land. This has led to low productivity of agriculture which most African countries depends on for both food and job security. This implies that, the little which is produced is also of poor quality and even if the produce surpluses were there it would never attract high prices to increase earnings which can support reinvestment in another enterprise for further income generation.

Ignorance of modern agricultural practices is an obstacle facing the youth in their quest for employment. Most youths are doing things they found their parents doing and hence the same results their parents always got are exactly what is being got. Agricultural productivity can never improve to the extent that it can become a source of employment for youth and other jobless people as long as the hand hoe is the only tool being used. The out put from this kind of practice is too low such that yields can be increased for produce to be offered for sale or even stored to meet future food needs. Families starve due to lack of food making it very difficult for any young person from such a starving family to have enough confidence to walk out of the house to look for a decent job or

start an enterprise. Hence they will always remain jobless and poor and incapacitated to create wealth.

Low attitude towards certain jobs

It has been proven that youths despise some jobs and call them “Local” most of these despised jobs are agriculturally and manually related. The youth prefer the so called white collar jobs where one sits in an office and uses the machines to ease the work load other than going out to the field for research work or practicing agriculture. The youth have also labeled some jobs to be for rural and un-educated people and when offered such jobs such as experimenting with farmers, most of them would prefer to remain unemployed than use his or her degree in the village or mix with the “uneducated farmers” through farmer participatory research approach. This kind of arrangement has left many young people in Africa jobless and roaming the streets of many cities in search of “good jobs” which they cannot get due to the stiff competition for such jobs.

Lack of timely and reliable information about the available jobs is a critical obstacle to youth employment and wealth creation in Africa. The poor young people who are fresh from universities and colleges have no access to information about the existing jobs because they are too poor to access job related information from the media in which these jobs are advertised. Related to this, the vulnerability caused by poverty has made many youth desperate that most of them wake up in the morning and walk long distances in search of employment. This has caused their health conditions to deteriorate, due to stress, starvation on the streets as they search for jobs, further contributing to low self esteem and frustration.

After the long struggle of job searching and getting one, the youth in Africa have no job security. Since these are young people still in the “morning” of their lives and careers they lack experience and yet they are not given the time to gain experience on job. When the employer discovers that the young person is just learning on the job, he sacks him /her. This prolongs the trend of unemployment for the youth in Africa since they are so poor and defenseless without money. They simply give up in frustration and are not willing to do anything towards wealth creation due to lack of capital to invest in the business, which they may have thought of engaging in.

It is also common that the youth are under paid. This is because in their search for the job they appear to be desperate and in the end, the employer may offer the job with a lower salary and yet the work is very tedious and / or they must work under hazardous conditions with greater risks of accidents, chronic sicknesses, and stress or even at worse death.

Corruption has also proved to be one of the serious obstacles to youth employment and wealth creation. The young people who have not yet saved any income to invest in developmental activities are often faced with corruption at every level of their lives. It is common to find that if a young person applies to tender to supply goods and services to

an organization at the same time as a more established person or firm, the competitor may bribe the organization or due to their track record, win the tender while the poor youth who has nothing to offer, nor the experience, loses the opportunity. This has affected the efforts of the young people as they are not motivated to invest because of the seemingly rampant corruption in Africa.

In countries where there are wars going on like in the northern part of Uganda, getting a job is a big challenge to many youth. The rebel attacks scare away the people and they all camp together where there is no land to farm, no money to buy whatever is being sold and no hope of getting any enterprise to invest in as there is no capital for start up. The number of people searching for employment therefore becomes too many as the population of the unemployed increases and is concentrated in one refugee camp making the jobs even scarcer.

Bulindi Agricultural Research and Development Centre, (our way of creating employment for the rural communities and enhancing food security)

Agriculture employs more than 80% of the sub-Saharan African population. In Uganda, the National Agricultural Research Organization whose major goal is to contribute to sustainable improvement of agriculture by conducting relevant research to eradicate poverty and improve the livelihoods of the rural poor has employed many tools and approaches including agriculture, technologies, science and innovation to create employment for the rural communities. Bulindi Agricultural Research and Development Centre is one of the twelve research centres under National Agricultural Research Organization making this strategy for improving peoples' livelihoods effective. The research centre achieves this goal through many ways and steps which can also be adopted to create employment and wealth for youths in Africa because this is being applied to both youth groups and any other organized community groups and this has been successful to date. Below are the steps we practically use to create employment and enhance food security for the rural communities with which the research centre work.

Group identification and selection

It is believed that for any effort, aimed at achieving community development to be effective, it has to be channeled through an organized group of people. This is because innovations can easily be promoted in an already focused group of people who share some common objectives. With this belief ingrained in the institution's policy, a search for competent groups in the communities is usually launched to identify groups which have strong links with the rest of the community which later will be used to scale out the findings of whatever activities the research centre may want to do with the groups. Before the scientists from the research centre can move out to identify the groups to work with, a needs assessment survey is carried to find out whether what the centre wants to take out to the community is really what the community members want. In many societies in which this needs assessment survey was conducted, findings revealed that, there was high unemployment due to illiteracy and all the problems associated with job

seeking mentioned above. Another common finding is that there is inadequate food in most households, lack of income due to lack of capital to invest in income generating activities and general ignorance about what type of enterprise the community should invest in to reduce unemployment and food insecurity in the community.

When the problem has been identified and the groups through which the development or the solution is to be channeled are selected, the groups are then taken through a process of community participatory diagnosis and visioning. Community participatory diagnosis is an interactive process of building rapport with the community and confidence by holding dialogue with them, discussing various facts about the area and their livelihood. It is aimed at creating a better understanding of community livelihood assets, opportunities and strategies that form basis where future activity plans and interventions can be developed to improve the community's livelihood. The process involves a visioning exercise that challenges farmers to reflect much longer into the future than in day to day problem solving. Various tools are used to collect basic information about the area which is meant to lead into enterprise development process. The output of this activity is to generate a range of baseline data about the community so that hope is restored into peoples' hearts. This hope is restored when people discover through this activity the major assets in their communities that can be used to create employment for the community members and also through effective utilization of the communities' resources, food insecurity which is so common in the communities is avoided. This exercise also brings out the constraints in the community which may hinder food production and development of income generating enterprises.

The main purpose of identifying constraints to development in the community is to make members aware of them and together brain storm on the possible solutions or coping mechanisms. The process of community diagnosis moves hand in hand with community visioning. Visioning makes the community look in the future and imagine what they would love to have in the near future and in the long run to call whatever activity they are involved in a success. Community members can be facilitated to look into the future by giving a time frame and imagine all the good things they would love to have say in 3-6 years' time if they get involved in an activity which will utilize the resources that the community has developed through their own initiative. This sounds like a dream that can easily become true and it excites people, putting them in the mood to work so that they can realize their dreams. It is believed that before one does some thing, it must first be thought about, visualized and planned before one is prompted to do it.

The process of community participatory diagnosis and visioning leads to identification of activities to be done so that the dreams of having cows, permanent buildings and all the good things that any normal human being can dream about can come true. Since inadequate food poses a very serious threat to the livelihood of many households, the community is guided to select three major food crops which are important to them in fighting famine. The community is also guided to select crops, livestock and any other activities that to them can be promoted for income generation. At a later stage, a few

selected group members are facilitated to undertake market research to confirm the income enterprises selected.

Experimental design

To experiment on the selected food crops could have been selected, the experimentation committee is then selected so that the different varieties of crops are tried on different soil types using the same treatments. The committee is selected to do this experiment because of the scarcity of the planting materials which in most cases are not enough to be given to all the group members and because of the uncertainty of how the crops would perform. As a subsidy, the research centre provides the groups with improved seeds and other planting materials of the crops selected for food security. The experimentation of these crops is done for three seasons and together with the rest of the group members the experimenting committee monitors and evaluates the varieties against their own varieties. After evaluation, the community then selects the best alternative that suits their ecological system for multiplication and dissemination.

These new technologies are usually high yielding and have short maturity period. The youth would be attracted to these new technologies as they take a few weeks to mature and yet the harvest is high. The low yielding and late maturing varieties that seem to discourage the youth from practicing agriculture as an alternative employment venture is then replaced. More youth who are unemployed willingly join during this farmer participatory research. They are willing to share both their academic and indigenous knowledge in agricultural practices as they mix freely with the research scientists and eventually take up agriculture as an employment and income generating venture. This does not only solve the problem of unemployment but also boosts food security in many households which are currently starving due to lack of food caused by poor and low yielding crop varieties that most households are busy struggling to multiply to no avail.

Incorporating indigenous technical knowledge into agricultural production

It was noted with concern that most youths and the entire community who could have successfully practiced and promoted agriculture through use of traditional agricultural practices shy away because they seem to think that the practice is local. The research centre has popularized the use of indigenous technical knowledge in agricultural production. The local botanicals like ash, red pepper, tobacco dust and urine are some of the traditional pesticides used to prevent damage of produce and crops. It has been proven that red pepper and ant hill soils can preserve produce for at least eight months which is good enough for an individual to have had time to identify markets, crops were for sale and for food, the new harvests would have been out of the fields.

Participatory market research is one of the ways that the centre employs to ensure that the community selects the best income generating enterprise as a confirmation of the crops and livestock selected during the participatory community diagnosis. Just like in the experimentation of food crops committee, where members are selected to experiment, in

the same way, a market committee who can conduct a guided market visit to explore market opportunities, information and then give a feedback to other members is selected. This market visit enables them to make informed choices on the enterprise that will be further developed for the identified markets. It also helps the community to produce what is being demanded in the market and not try to sell what they have produced. The selected market committee is given a task to explore other market opportunities found in the visited market outlets outside the initial enterprise list. The committee then brings the feed back to the rest of the group members who did not go for the market visit the information about the market opportunities found. This leads to the selection of an enterprise for income generation based on the information got from the market about different commodities.

Cost benefit analysis

This is done to help the poor communities and job seekers who are already financially constrained start with an enterprise that is relatively cheaper. At this stage of the enterprise development, the community is advised to use locally available materials to reduce the cost of production. This however does not mean that, the freely available materials are not being considered as important. It is advised that the community costs every thing so as to determine how much profit the enterprise is generating assuming that all the materials were bought.

Capacity building of the groups

This is done through training in group strengthening, soil fertility management, marketing skills, record keeping and cross cutting issues such as environment and HIV/AIDS. The purpose for these trainings is to make these groups community change agents which are there to scale out the developmental innovations and technologies.

Popularization of agricultural technologies

This is usually done through the media to advertise newly released technologies by outlining all its attributes. Use of farmer groups who have already adopted the new technologies to share the information about the new technologies is also important to see to it that the whole community is aware and are willing to adopt these technologies. With this kind of arrangement, peoples' attitude towards agriculture as a low profile job is reduced and even the youth seeing that agriculture has become one of the enterprises attracting the government' and the donors' attention have chosen to form themselves into groups so as to get help to practice modernized agriculture and help in the dissemination of new technologies, hence increasing job opportunities for the youth and reducing the threat of food insecurity in many communities.

Commercialization of agricultural produce

Besides the production of agricultural produce for home consumption only, more attention has been diverted to commercialization of the crops produced. The newly released high yielding crop varieties have caused many households to produce more than usual and due to poverty and lack of capital to invest in other lucrative enterprises, the food surpluses are sold to urban communities to boost their income. This move to commercialize agricultural products and linking farmers to microfinance to access loans to increase their production capacity have changed the mind of many people who used to think that agriculture and all its related practices are for the poor and local people and not worth investing in. Farmers are now accessing loans to produce enough crops both for home consumption and for sale so as to generate some income for the households.

It has also been noted that most people do not take agriculture as an income generating enterprise because they are ignorant about the market opportunities. The research centre after identifying the groups to work with, selection of the food crop options, selection of income generating enterprises and linking producers to services that can boost production, forges ahead to link producers to potential buyers. This is done to encourage producers to take agriculture as a potential income generating enterprise which one can invest in and make money like any other enterprises. As mentioned above, the idea of linking producers to the market is to ensure that they produce what is being demanded in the market and produce what they can sell. Once the community sees that the organized groups are benefiting in all these ways, more members mobilize themselves into groups and start demanding services that can help them practice modernized agriculture to improve their livelihoods. This is a win/win situation.

Identifying the researchable issues

As all the above processes are going on, research scientists and the group members identify research issues arising from the experiments and the interaction of the scientists with the community. As the scientists get to know the community members well and a rapport is built, the community members start confiding in them and mentioning what they like and do not like about the newly introduced technologies. Through this interaction, issues worth researching come up which scientists can further look into as a way forward to improve on new technologies and identify gaps in technology adoption. As research is done on these identified research problems, technologies are improved and become popular for adoption, hence attracting more people in agriculture to reduce poverty and food insecurity.

Encouraging innovations

Communities in most cases ignore the resources that are locally available that could be of great importance in enterprise development. It is important that efforts are geared towards making people using the cheap or even some times free materials that can be used in income generation. An enterprise like brick making needs mainly local materials and yet

mud bricks make even more beautiful houses than the concrete blocks that many people would love to invest in as an income generating enterprise and yet the start-up capital is not affordable by many people. Use of locally available materials makes increases profits than using other materials for the same work.

Conclusion

In conclusion, there is no area in Africa's development agenda that is not affecting the youth. A youthful population offers many economic advantages-in terms of a dynamic aggregate supply of labour, with all its implications for macroeconomic management, opportunities for mass production and hence industrial development-enhancing economies of scale in production, and a buffer for social security and pension systems. Attention and policies must therefore be directed to activities and innovations that can create employment for the youth and promote food security in communities. Even as there is need to create employment and promote Agri-food production and consumption, critical issues like; the depletion and contamination of natural resources, pollution and food contamination as the drive towards food preservation, use of improved production technologies and processes, as well as products aimed at increasing agricultural yields and facilitating food conservation can also have significant environmental consequences if not properly managed. Even as efforts are being geared towards creating employment and enhancing food security, bio-safety and food safety are also important issues related to Agri-food production, processing and consumption. However, employment and wealth can be created by facilitating group formation, testing of technologies before adoption, identifying market opportunities, linking groups to microfinance institutions and input providers so that as a group their access to such services is eased and costs reduced, thus making them enjoy economies of scale which boosts both food security and income generation.

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