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ASSESSMENT OF AGRICULTURAL REVOLUTION FOR DEVELOPMENT AND SOCIAL INTEGRATION IN GLOBAL PERSPECTIVE

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ABSTRACT

The agricultural revolution for development study is a historical survey that evaluates the role of agriculture in mainstreaming players in the industry. The present study was premised on the background that besides societal transformations that accompanied agricultural revolution it set in motion a broad spectrum of social exclusion since Neolithic period. The overall objective assessed agricultural revolution for development and social inclusivity. Specific objectives examined the nature and dynamics of agricultural revolution, challenges to agricultural revolution and social integration and examination of measures for social inclusion to enhance sustainable agricultural development. The study was informed by articulation of mode of production theory. The researcher applied historical and descriptive research designs. Data collection instruments involved observations and semi-structured interviews. Primary data entailed visiting archaeological sites to observe ancient agricultural tools, while secondary data involved documentary analysis, journals, theses, books, professional magazines, reports, internet, published and unpublished sources. The gathered data was analyzed qualitatively. The study findings were as follows: agricultural revolution excluded women, youths, people with disability, the poor, technological transformation, and divided society into owners of the means of production and the farm workers. Agricultural serfdom attitude of the medieval period influenced the role of the youths and agriculture trained professionals in regard to practicing agriculture. Finally agricultural revolution has been a vehicle for knowledge, industrial revolution, human, plant and animal domestication. The study recommends broad-based policies that capture social inclusivity, bottom-up approaches, affordable and appropriate technological innovations that are in tandem with consumer needs. Agricultural social inclusion is a catalyst to sustainable agricultural revolution for rural and urban development.

Keywords: Agriculture, Development, Revolution, Mainstreaming, Social Exclusion and Inclusion

INTRODUCTION

Agricultural revolution is a humanity revolution because it affects humanity either directly or indirectly hence a global revolution. It is a revolution that is not inhibited by race, sex, age or creed, instead carries attributes inherent in human nature. To greater extent agriculture revolution was the precursor of history. Having started 10,000 years ago the process has gone through various stages some of which mild while others more pronounced. As a cultural process, it was marked by gradual cultural transformation whose ultimate was domestication of plants and animals. At one stage agriculture revolution reflects man's developmental continuum from one level of knowledge to the other while on the other end reflects the role of man in the continuity of history.

Agriculture revolution marked the beginning of history underscored in the invention of Hieroglyphic writing in Egypt and cuneiform in Mesopotamia and gradual beginning but steady movement towards perfection of human race. From Neolithic, characterised by gradual beginning of domestication of both plants and animals to medieval period marked by spread of plant domestication from one region to the other and continent to the other to English agricultural revolution, marked by a leap in population and unprecedented agricultural production, then Green agricultural revolution that can be described as a laboratory or planned revolution based on research, technological transfer and development and finally the genetically modified food revolution, which is the most controversial but potent as the most advanced agricultural revolution in agriculture today. Though each of this revolution differed from the other the bottom line was man's step by step upward movement in response to his needs and hence interaction with environment. Like a river from its source, agricultural revolution started small 1200 years ago and gained momentum but unlike the river that flows downstream agriculture revolution moves against the current throwing off those which cannot sustain upward thrust and picking others along the way. In essence, though agriculture revolution causes development but does not contain forces of integration to sustain upward thrust for all players like women, youths, people with disability and the poor. Neither has agriculture grown to undo the threat of food insecurity that has remained a threat to humanity since the foraging community. This explains the origin of disparities among people, what Karl Max referred to as the haves and have not, and global food insecurity particularly amongst the third world countries. It was from this background that research was undertaken to establish the dichotomous relationship between agricultural revolution that leads to development and social exclusion.

Statement of the Problem

The study of agricultural revolution for development is the investigation of man's existence from pre-historic time to the present, in terms of knowledge development, his interaction with the environment including plants and animals separately but later as a family under domestication. Man's life from hunting and gathering to sedentary agriculture, domestication of land, beginning of a home, a community to an urban center then to the nation. Emergence of a family, intra and inter-communal interaction to the nation, a region of nations then to the global society. Record keeping that called for writing, hieroglyphic in Egypt to cuneiform in Mesopotamia, growth of mathematics to geometry, to fractions and survey, understanding of weather patterns and astronomical data that evolved into the calendar and time. In essence, the study of agricultural revolution is the study of totality of human race and its dynamics. Though studies have been done on agricultural revolution but scanty work has been undertaken to unearth the dichotomous dilemma of agricultural revolution that, though leads to development but fails to acquire social integration of the players in the industry. Indeed at the end of agricultural revolutionary process we still find marginalized women, youths, and people with disability, the poor and food insecurity. Unfortunately the process seems to be on-going regardless of the interventions strategies. For over 10000 years, agricultural revolution has occurred more than four times marking both a gradual and drastic cultural change in human society. The emerging genetically modified food revolution is the latest on the line of agricultural revolutions. It is therefore, these continued unfolding revolutions in agriculture to date that this paper was researched and written. The study took a global dimension because agricultural revolution is a global, human event that is not limited to state, culture nor race it supersedes nation boundaries. Similarly, technology which turned

the world into a global village, did the same to human race, and enabling access to documentary analysis for this research

Objectives of the Study

The overall objective was to assess agricultural revolution for development and social inclusivity.

Specific Objectives

The specific objectives were:

- a) To examine nature and dynamics of agricultural revolution for development and integration
- b) To establish challenges to agricultural revolution for development and social integration
- c) To examine the measures for social inclusion to enhance sustainable agricultural development

Research Questions

The research questions were:

- a) What was the nature and dynamics of agricultural revolution for development and social integration?
- b) What were challenges to agricultural revolution for development and social integration?
- c) Which measures could be undertaken to enhance social inclusion and sustainable agriculture?

Justification of Study

The section underscored the theoretical, practical and policy justifications for the study. This study was concerned with establishing dichotomous relationship between agricultural revolution for development and social integration. Studies and experience disapproved the belief that agricultural revolution left on its own would naturally have the youths, women, people with disability and the poor integrated into sustainable development. Instead the opposite was the case exemplified in incidences of social exclusion particularly among third world countries. By 2005 Africa had the largest number of the youths totaling to 257 million yet not integrated in agriculture (Ngongi, 2015). Similarly, though Gender mainstreaming was one of the eight Millennium Development Goals of United Nations and all member states were expected to underscore reduction of gender disparities and empower women, it remained undone. Furthermore, estimates by World Bank suggested that 1 in 10 world's population had disability, with 80% being in developing countries yet their integration in agriculture remained a distant dream. James Edge argued that dealing with people with disability was equivalent to dealing with the poor of the poorest (Eskola, 2015). The paper undertook a global dimension, first because agriculture revolution was a global phenomenon and two; it was to explore a broad spectrum of interventions which would provide a wider understanding to the disparities that exist among agricultural players and the means of interventions engaged in order to assist the vulnerable groups in terms of policy formulations globally.

Theoretical Frame work

The study was informed by articulation of mode of production theory. According to Karl Marx (1818-1883), for people to survive in the society they enter into unequal however definite production relations with the environment as they perform different roles. The bottom line however was not only the division of roles between the owners of the tools, instruments, technology, land, raw materials that were used in production but the exploitation that the workers were subjected to in the process of working on the environment. To Marx society had moved through a number of modes of production from primitive communalism, to feudalism to capitalism and was headed to socialism then classless communism.

The researcher adopted this theory because agricultural production involved nearly all human beings to work on the environment. Unlike the pre-agrarian society where people were equal in classlessness society the advent of agriculture brought in both divisions of labour and role differentiations among people, farm owners and farm workers. In essence articulation of modes of production is the lens through which characteristics of agricultural revolution can be explained and understood.

RESEARCH METHODOLOGY

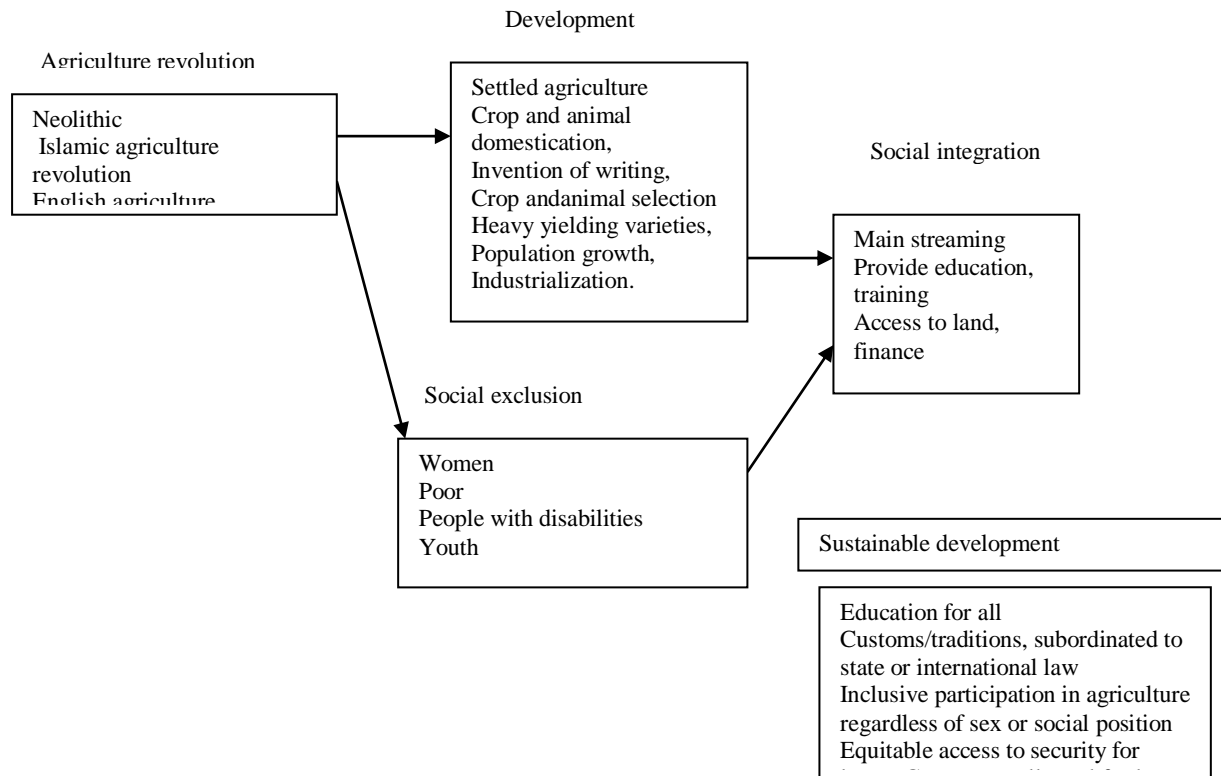
The study applied historical and descriptive research designs in order to address specific issues underscored in each study objective and question. Study objectives were achieved by consulting, verifying and synthesizing both primary and secondary data. Data collection instruments involved observations and semi-structured interviews. Primary data entailed visiting archaeological sites to observe ancient agricultural tools at Hyrax Hill and Kariandusi Nakuru including internet pictures of agricultural artifacts found in Britain. While Secondary data involved documentary analysis of journals, theses, books, magazines, reports, internet and other published sources. Data was analysed qualitatively by looking for cross-cutting features, trends, checking emergent patterns against the data, corroborating or crosschecking or verifying the validity of data sources and networking various parts of the data.

RESULTS

The Nature and Dynamics of Agricultural Revolutions

Prior to the domestication of plants and animals, man was a hunter and a gatherer, Baker acc. August 8, 2015. Even at the level of hunter and gatherer two levels can be identified early pre-agrarian, associated with crude tools of Homo Habilis and later pre-agrarian associated with slightly refined tools of Homo Erectus. Agriculture revolution took similar breadth of gradual change from rudimentary to complex (Peter et al., 2015). Archeological evidence coupled with studies from people who still practice hunting and gathering like the Khoisan suggests that the Neolithic agriculturists did not totally disconnect from hunting-and-gathering activities but hunting remained as a hedge against the ever-present threat of starvation (Peter et al., 2015) However as they gradually perfected agricultural art they became more adept at cultivating not only one variety of crop but a range of them meaning that from the very beginning man experimented on crops and 10000 years down the line the process is still ongoing (Peter et al., 2015). Indeed the 'mother' of all agricultural revolutions Neolithic revolution was a gradual process because cultivation was prohibitive in sense that it involved more labour. Unlike hunting and gathering where nature provided for man with some immediacy though tedious, agriculture was a process which demanded for a season or more to provide food. Similarly, human nature has a propensity to resist change because it comes with uncertainty this in part explains the persistence of some hunting and gathering communities to date.

Agricultural revolution for development and social integration model



Domestication

From the very beginning the bottom line of agriculture revolution was domestication of land, man, knowledge, animal and crops. Crop domestication;-early crop farmers broadcasted wild seeds, which cut down on labour requirement (Peter et al., 2015) but more importantly it reflected the rudimentary beginning of agricultural crop farming. As man acquired more farming skills he took great care in selection of the best grain for seed and mixed different strains in ways that improved both crop yield and resistance to diseases. Similarly, it was selective cropping that increased British agricultural revolution (Overton, 2015). In essence, farming having started about 10000 BC, its greater effect was felt several millennia later during the English agricultural revolution in 1750. This shows both the gradual evolution of agriculture and the number of years of experimentation entailed in agriculture production. Though domestication of various crops evolved in separate locations worldwide but some species diffused from one environment to the other. Plant domestication brought about determination of agricultural output based on amount of the seeds sown, Baker acc. August 8 2015, by extension, it gave greater meaning to the relationship between yields and land size hence increased man's need for land as a factor of production.

Animal domestication;- Most animals were domesticated between 8000BC and 5000BC (Peter et al., 2015). Different animal species were domesticated in different ways based on the nature of the animal, its vulnerability in relation to the predators and in the way man interacted with them. Like crop farming, selective animal breeding enhanced agriculture revolution whose higher yield was similarly realised during the British Agricultural revolution (Overton, 2015). Domesticated animal cut down man's hunting habits and provided him with meat, milk, shelter, cloth material and containers. Indeed crop farming and animal farming evolved concurrently setting the roots of conflict that came to characterize the farming and livestock keeping communities.

Ultimately, domestication of plants in turn domesticated man. He was forced to stay in one place, plant, nurture and wait for the crop to mature. It is important to note further that for man to have

continued to domesticate animals and even plants he had to learn them, domesticate their behaviour patterns in response to varying weather conditions including diseases. In essence agricultural revolution set man on a long but important journey of discovery of medication for both animals and plants and therefore the branches of knowledge veterinary medicine, crop and animal husbandry evolved.

Land domestication;-Sedentary agriculture bestowed greater importance to territoriality, discovery of mathematics, survey and geometry which became handy to land distribution and record keeping. Further, land domestication was enhanced through application of organic manure to enrich the soil. During the Islamic golden age organic manure and legume plants were used to replenish fertility by increasing nitrogen content to the soil (Overton, 2015). When commercial fertilizers was used later including crop rotation, for example in Britain between 1939 and 1951 yields increased (Overton, 2015). During green revolution land domestication was further ensured through application of chemical fertilizers. Up to date artificial fertilizer has remained the major way of domesticating land.

Middle Ages and Agricultural Revolution in Europe and Islamic agricultural revolution

Comparative to Neolithic revolution, medieval Europe's agriculture revolution was marked by significant improvement, but acquired retrogressive agricultural social integration attributes. The European society at this time was divided in hierarchical socio-political order with privileges apportioned to each strata determined by birth. At the top was the King, followed by the Clergy then the landed nobles and below were peasants or serfs who owned little or no land at all but instead were bound to the soil and service to the nobles in return for protection (Butter, 2015). This was unlike in the Medieval Islamic Agricultural Revolution society which was marked by diffusion of many crops and farming techniques among different parts of the Islamic world. Sorghum from Africa, Citrus fruits from China, while Mangoes, Sugar cane, Cotton and Rice came from India and were distributed throughout the Islamic world (Butter, 2015). Agricultural workers in Medieval Islamic world were not serfs but both men and women from diverse ethnic and religious background. Crop yield in Medieval Europe was low unlike in Islamic Agricultural revolution which registered a significant increase in agricultural output. This in turn boosted urbanization in the Muslim world which came to be characterized by narrow winding city streets. Similarly, Muslim scientists set the foundation of agricultural science reflected in advances in agronomy, astronomy, botany and earth sciences. Muslims developed water mill irrigation machines, water raising machines, dams and reservoirs which helped expand farmland.

British Agricultural Revolution (1750 – 19th century)

Unlike agricultural revolutions that preceded the English Agricultural Revolution, the latter was a planned agricultural change attributed to Jethro Tull, Lord Arthur Young, Bakewell Coke and the Collings though not without dispute (Overton, 2015). Specifically, unlike Neolithic Revolutions whose origin was based on various factors including, need to replace hunting and gathering which had become tedious, increasing population pressure, depletion of wildlife which called for solution to provide man with meat, the agricultural revolution in England reflected man's acquisition of a higher level of control to his destiny. Unfortunately it took man about ten millenniums to get there. British agricultural revolution involved both selective breeding of livestock and cropping and the removal of common property rights on land; Overton acc August 3, 2015 which had characterized medieval Europe (Overton, 2015). English agricultural revolution was marked by increase in labour, generated by unprecedented population growth from 5.5million in 1700 to 9 million in 1801 and land productivity with unprecedented increased output. It was the resultant effects of agricultural revolution including demographic factors that caused industrial revolution. By extension thus agricultural revolution industrialized England at first, then her technology was copied by other European countries, new inventions added and eventually industrializing entire Europe and the world. Like English agricultural revolution, the Green Revolution (1960's-late 1970's) was a planned revolution. It was founded on scientific research, whose results included improved seeds, farm technology, use of chemical fertilizer, better irrigation and technological transfer that revolutionised agricultural sector in India. FAO acc 10, July 2015

Genetically modified foods revolution

The most recent yet most contested agriculture revolution today is genetically modified food revolution but it is interesting to learn that the fears displayed today were similar challenges that Neolithic agriculturists faced 10000 years ago. Alongside sedentary agriculture Neolithic farmer hunted and gathered to safeguard himself against ever increasing threat of hunger. Today's fear for GMO is based on research done both in developed and developing countries Daily Nation, Sep 22, 2015. In South Africa where GMO started in 1997 the situation has not been rosy neither Research has discovered repercussions including ecological risk and difficulty in cultivating GMO and non-GMO together in small rural farms. In conclusion thus, agriculture revolution is the longest and most dynamic, having started 10000 years ago it is ongoing till today but with different tact. As the Neolithic farmer wondered over the longer period his crop was to take on the farm before harvesting the GMO farmer is worried of the short period the crop would take on the farm before harvest. Though the argument appears circular but if GMO's side effects were fully corrected it will go down to history as yet another great agriculture revolution. In all agricultural revolutions, noted conspicuously is reward for masculinity and the rich as the vulnerable women, people with disability, the poor and youths were kept off focus.

Challenges to agricultural revolution and social integration

Prior to agricultural revolution women and men of Hunter-gathering societies worked together though women were granted greater status (Boulding, 2015). Women also gathered fruits and nuts with the help of the children (Boulding, 2015). The greatest effect of agricultural revolution however was the social exclusion of women from men that came along with the revolution. Isolation of women begun when they took up tasks that required them to be in one place for longer time as they took care of the children in a home set up and other related roles including pottery, weaving and cooking. Men on the other hand took up roles that required masculinity as was demanded in agriculture to get the necessary work done. Similarly when digging sticks were replaced by animal drawn plough women were no longer the primary workers of the field (Boulding, 2015). This was equally true during the British Agricultural revolution which caused drastic changes in the lives of British women. Prior to the British revolution women in Britain worked side by side in the fields with their husbands. However the increased efficiency of the new machinery, along with the fact that this new technology was often heavier and difficult for a woman to wield, made this unnecessary and impractical, and women were relegated to other roles in society. To supplement the family's income, many went into cottage industries as others became domestic servants (Boulding, 2015). During the Green Revolution as well, though was marked by great success in terms of increased agricultural output the data from India indicated that although agricultural modernisation increased the demand for agricultural labour wage rates remained static with scanty employment opportunities. Within this bleak employment scenario, women were paid lower wages than men and were often assigned the more labour- intensive tasks such as weeding, transplanting and harvesting FAO acc 10, July 2015. As colonialism was entrenching into Africa, the importance of women's agricultural contribution to the household was reduced as their vital role in food production was overshadowed. The Northey Circular in Kenya (1919) for example commanded district officers and African chiefs to procure women labour for private and public works. Similarly colonial economy forced men to seek employment in European economic ventures and took them away from the labor responsibilities they used to have in the traditional African economy in return it intensified female labor, and led to drop in cultivated acreage.' Women found that not only did they have to fulfill their traditional duties as women; the loss of male labor forced them to take on the duties previously carried out by men.

As the cash crop economy grew in colonial Africa, the colonial government imposed the new cash crops (cocoa, coffee, cotton etc) on men and because of their market value, men accepted to cultivate them. Although women were expected to grow foodstuffs, their labor was also required in the growth of cash crops. This doubled the agricultural load on women. Shellinton (1989) . Also, the introduction of new technology, especially the plough had a negative impact on women. The plough enabled men

to cultivate more land. But men left the backbreaking, labor intensive work of sowing and weeding to women. Thus the women's load was increased. The plough also made men more directly involved in crop cultivation thereby increasing the men's right over proceeds earned from the cash crop. To many men, this meant they could dispense with the money earned without consulting the women yet they did most of the work in earning the money. Hence, although women worked more, their economic dependence on men increased. Finally colonialism led to the complete loss of access to land by women in Kenya. The colonialists brought with them the idea of private ownership of land. Women were completely excluded from this ownership. Berger explains that in Kenya, the Swynnerton Plan of 1954 began a process of, 'registering and consolidation of land and granting titles to individuals, almost all of whom were men.' This policy weakened rural women's autonomy in the agriculture. Ogot (1995).

At the end women were stereotyped as sources of fertility. Their roles in child-bearing and raising got emphasized. Today women's roles are going back to being equal to those of men particularly in the developed countries. In foraging societies children had no responsibilities beyond feeding themselves and learning the hunting and foraging skills, and therefore they had much leisure, it was very common in agricultural societies to put children to work at the age of three, chasing birds from the food plots. Older children looked after animals, and keep them out of the planted areas (Boulding, 2015). While other, took care of their brothers and sisters in home setting. At the time of harvest older children, would help bring in the grain. In early medieval period agricultural revolution nose dived into serfdom and landlord quagmire. The lowest agricultural working class, serfs worked under the nobles. They were subjected to compulsory labour, heavy taxation, tithed yet they owned little or were landless Peacock (1982). In the medieval period thus agricultural production turned into punishment. Reversal of the state of affairs involves another revolution which liberated the serfs exemplified in French revolution of 1789.

During slave trade and slavery which took place between (1450 to 18th century) 12 million Africans men, women including young energetic youths were shipped into agricultural servitude to the American sugar cane and tobacco plantations (Shellington, 1989). In the new world, slaves worked in horrific conditions. As agriculture brought about industrialization of Britain and subsequently the entire European world and beyond the European countries largely abandoned agriculture and resorted to importing agriculture products, while those who remained on the farm mechanized farming. At the time of colonialisation of Africa by the Europeans, African labour was forcefully acquired to work on European farms. Such background negatively reinforced agriculture as oppression. This explains why both agriculture trained and non-trained youths engage in agriculture as a last resort. Though agriculture is the base of African economy, vast majority of the youths are not in the industry. In Sub-Saharan Africa for example in 2005 there were 257 youths and their population was expected to grow at 9.7 million annually, Ngongi acc on July 12, 2015 in essence exclusion of youth risked plunging Africa into food insecurity.

Measures for Social Inclusion to enhance Sustainable Agricultural Development

Enhancing agricultural education and vocational training opportunities to reach all target groups including youths, women, the poor and people with disabilities will be important measure for the development of skills needed for gainful agricultural employment. This has to be done through modern training or teaching because traditional teaching methods tend to lead to subsistence level of production and inhibits innovation (Ngongi, 2015). Training at higher levels, in marketing, business, policy making, engineering and finance should be undertaken inclusively to harvest an all round equipped, employable agricultural personnel. Curricula reviews should be enhanced to accommodate quality and practical skills (Ngongi, 2015). PWDs should be included in development strategies and training centres. Policies of PWDs should be implemented (Eskola, 2015). Youth, women and PWDs should access land without discrimination by ensuring that land laws enacted provide for equitable access to land by all. Traditions, customs and norms particularly in Africa should be subordinate to all inclusive non-discriminative international or state laws that underscore human rights, deter discriminating inheritance rights, and provide inclusive security of land tenure. Land policy reforms should take into consideration views of women, youths, the poor and people with disability (Eskola,

2015). Financial accessibility to all will be important in expanding self employment to all. The vulnerable groups have very little or no security or asset that could be used as collateral to secure loans from financial institutions. Associating agricultural production with oppression, punishment or dirty profession should be countered by investing in agriculture, supporting agricultural innovation and improving agricultural business (Ngongi, 2015).

CONCLUSION AND RECOMMENDATIONS

Agricultural revolution excluded women, youths, people with disability and the poor. Technological transformation divided society into owners of the means of production and the farm workers. Agricultural serfdom attitude of the medieval period, agricultural servitude during slave trade and colonial agricultural regulation influenced the role of the youths and agriculture trained professionals to practice agriculture. Agricultural revolution has been a vehicle for knowledge, industrial revolution, human, plant and animal domestication. Agricultural social inclusion is a catalyst to sustainable agricultural revolution for rural and urban development. The study recommends broad-based policies that capture social inclusivity, bottom-up approaches, affordable and appropriate technological innovations in tandem with user needs.

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