

AN 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 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 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 analyses, journals, theses, books, professional magazines, reports, and relevant internet sources. The gathered data was analyzed qualitatively. The study findings were as follows; 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 influenced the role of the youths and agriculture trained professionals with regard to practicing agriculture and finally agricultural revolution has been a vehicle for domestication of man, plants, animals, knowledge and ultimately industrial revolution,. The study recommends broad based policies that capture social inclusivity, bottom -up approaches to agricultural revolution, affordable and appropriate technological innovations that are in tandem with consumer needs. In conclusion, agricultural social inclusion is a catalyst to sustainable agricultural revolution for rural and urban development.

Key words: agriculture, development, revolution, mainstreaming, social exclusion and social inclusion.

1.1 BACKGROUND TO THE STUDY

Agricultural revolution was a global revolution because it affected all human beings however in varied levels. It was a revolution that was not inhibited by race, sex, age or creed, but carried attributes not only propelled by man but also enhanced man's survival as well as transformation of society. The beginning of agriculture revolution was the precursor of history realized in record keeping. Having started 10000 years ago, agro-process passed through various stages of cultural transformation, starting with domestication of plants and animals to clear-cut developmental continuum of man's society from one level development to the other.

Agriculture revolution marked the beginning of history underscored in the invention of writing: hieroglyphics in Egypt and cuneiform in Mesopotamia and gradual beginning but steady movement towards perfection of human knowledge. From the Neolithic revolution characterized by gradual beginning of domestication of both plants and animals to medieval agricultural period associated with dispersal of plant domestication knowledge to English agricultural revolution which was associated with a leap in demographic levels and unprecedented agricultural production to Green agricultural revolution that can be described as a laboratory or planned revolution based on research, technological transfer and finally the genetically modified food revolution, which is the most controversial but potentially most advanced agricultural revolution today. Though each of this revolution differed from the other the bottom line was man's step by step movement in response to his needs marking the meeting point of history, the fauna and floral. Like a river from its source, agricultural revolution started small 10000 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. As a result, though agricultural revolution cause transformation but does not contain all inclusive forces of integration to sustain upward thrust for all players in the industry the women, youths, people with disability and the poor. Agriculture revolution has neither grown to undo the threat paused by food insecurity which has remained a challenge to humanity since the foraging communities. This, further explains the origin of disparities and rivalry among people in society, what Karl Max referred to as the basis of conflict between haves and have nots as they interacted with the environment to meet their survival needs. It was from this background that research was undertaken to establish the dichotomous relationship between agricultural revolution that leads to development and social exclusion.

1.2 Statement of the Problem

The study of agricultural revolution for development investigated man's existence from the beginning of agriculture to the present as demarcated by significant however unsatisfactory changes in agricultural production. At first man depended on the wild environment and its products plants and animals for food but later as a tamed, interdependent family consisting of man, animal and plants under a household of domestication. Though, agriculture revolution marked the beginning of a home, a community to an urban center to intra and inter-communal linkages, to interstate networks up to the creation of a global society, record keeping, growth of arithmetic, geometry, fractions, survey, understanding of weather patterns that evolved into measurement of time based on seasons and later pegged on calendar yet little work has been undertaken to unearth the dichotomous quagmire of agricultural revolutions that, though leads to development but fails to acquire social integration of the players in the industry. Indeed at the end of various agricultural revolutions man finds himself faced by new challenges including food insecurity and social

exclusion of women, youths, people with disability and the poor. Unfortunately the process seems to be on-going regardless of interventions strategies. In the span of 10000 years, agricultural revolutions have 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 the continued unfolding revolutions in agriculture alongside social exclusion that this paper was researched and written. The study took a global dimension because agricultural revolutions are global human events that supersede state boundaries, culture or race.

1.3 Objectives of the Study

The overall objective;-

Assessed agricultural revolution for development and social integration.

Specific objectives were;-

- a. Examine the nature and dynamics of agricultural revolution for development and social integration
- b. Establish challenges to agricultural revolution for development and social integration
- c. Examine measures that could enhance social inclusion to enhance sustainable agricultural development

1.4 Research questions

- 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 agricultural development?

1.5 Justification of study

The section underscores 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 integrate youths, women, people with disability and the poor and instead social exclusion came in exemplified in incidences of social exclusion, for example in Africa 10000 years down the line, Africa has the largest number of youths totaling to 257 million yet most of them were not integrated in agriculture, Ngongi (2015). Similarly, though Gender mainstreaming is one of the eight Millennium Development Goals of United Nations and all member states were to reduce gender disparities and empower women, it has largely remained on paper particularly among the developing countries. Similarly though estimates by World Bank suggest that 1 in 10 world's population had disability, with 80% found in developing countries yet their integration in agriculture remained a distant wishful thought, Edge (2013). The study took a global dimension because agricultural revolutions were global phenomena whose broad spectrum exploration provided a wider understanding to the disparities that exist among agricultural players and the means of interventions in order to assist the vulnerable groups in terms of policy formulations.

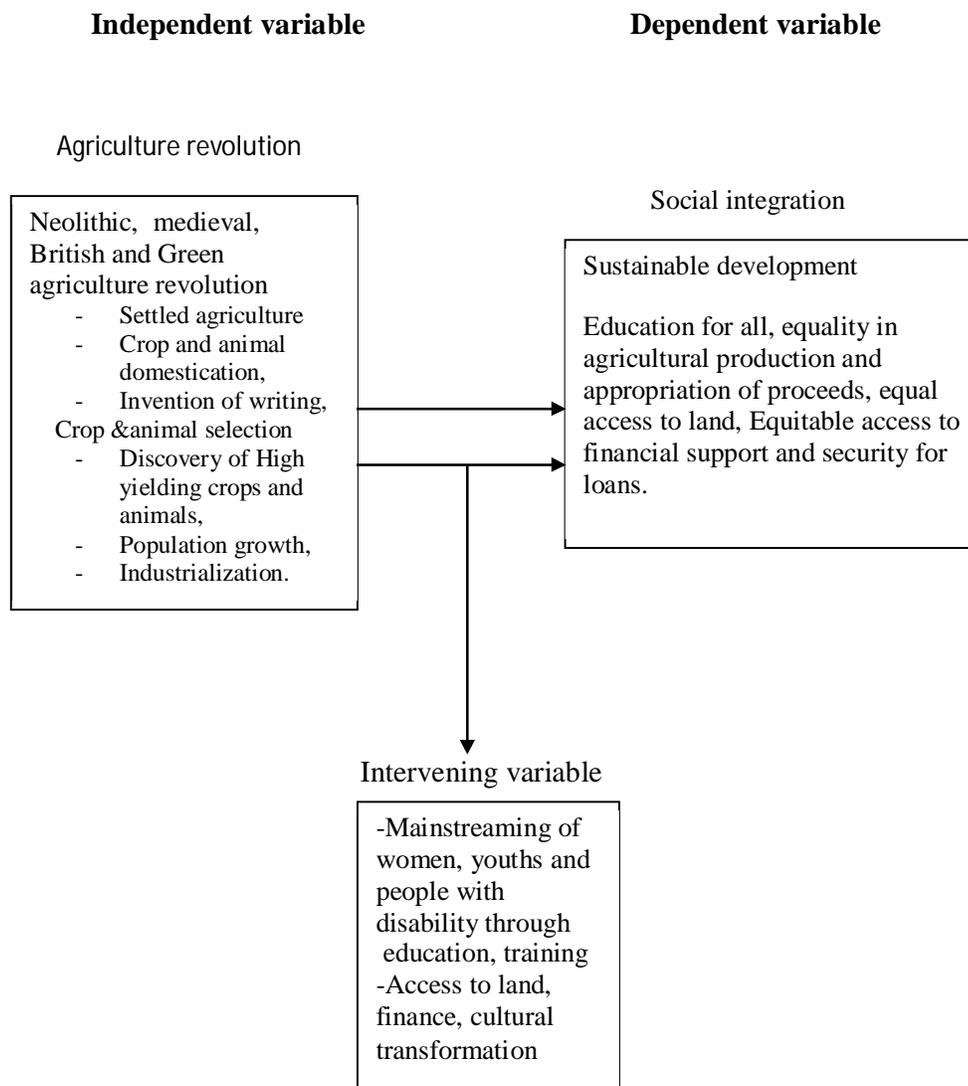
2.1 Theoretical Frame work

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 yet definite production relations with the environment but perform different roles whereby the owners of the tools, instruments, technology, land, raw materials used in production exploit the workers. To Marx society had moved through a number of modes of production, primitive communalism, to feudalism , capitalism and was headed to socialism then classless communism.

The researcher adopted this theory because agricultural production involves man working on the environment to enhance survival. Unlike the equalitarian pre-agrarian society, the advent of agriculture brought in both division of labour and role differentiations between owners of the means of production for example machines and farm workers. In essence, articulation of modes of production lens exemplifies characteristics inherent in agricultural revolution.

2.2 Agricultural Revolution For Development And Social Integration Model.



3.0 RESEARCH METHODOLOGY.

The study took a global perspective narrowing on Neolithic, Medieval, British, Green and glimpses of genetically Modified Food revolution. The researcher 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 sources of pictures of agricultural tools found in Britain. While Secondary data involved documentary analysis, journals, theses, books, professional magazines, reports, internet research, published and unpublished sources. Data was analysed qualitatively by addressing cross-cutting features, trends, emergent patterns against the data, corroboration, verification of validity of data sources and networking various parts of the data.

4.0 The Nature and Dynamics of Agricultural Revolutions:-

4.1 Neolithic Revolution

Prior to the domestication of plants and animals, man was a hunter and a gatherer, Baker (1996). Even at the level of hunter and gatherer two levels can be identified early: pre-agrarian, associated with crude tools and later pre- agrarian associated with slightly refined tools. Agricultural revolution took similar breadth of gradual change from rudimental to complex Peter *et al.* (2015). Archeological evidence coupled with studies from people who still practice hunting and gathering like the Khoisan of South Africa suggest that the Neolithic agriculturists did not wholly abandon hunting-and-gathering activities but the practice remained as both a hedge against the ever-present threat of starvation Peter *et al.* (2015) and man's resistance to change for it comes with uncertainty Matunhu (2011). Similarly, cultivation was prohibitive in sense that it involved more labour unlike hunting and gathering where nature provided for man. However as the early farmer gradually perfected agricultural art, he became more adapted to cultivation he diversified crop and animals. By extension thus from the very beginning man experimented on crops, animals and soils and 10000 years down the line the process is on-going, witnessed today in the Genetically Modified food debate Peter *et al.* (2015).

4.1.2 Domestication

From the very beginning the bottom line of agriculture revolution was the domestication of land, man, knowledge, animal and crops.

Crop domestication;- Early crop farmers like in the biblical parable, broadcasted wild seeds. Broadcasting cut down on labour requirement Peter *et a*, (2015) but more importantly it reflected rudimental beginning of crop farming. As man acquired more farming skills, he took great care in selection of the best grain for seed, mixed different strains in ways that improved crop yields and resistance to diseases. Better farming techniques also came up in response to land topography like contour farming, row inter-planting or planting which allowed space for plant aeration and equal absorption of nutrients from the soil. Steady improvement in agricultural production which involved selective cropping gave rise to British agricultural revolution Overton. (1996). Having started about 10000 BC, its ultimate fruition was realized several millenniums later for example in Europe it was during the British agricultural revolution of 1750. Thus agriculture transformation was a gradual process that entailed several years of experimentation.

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 (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 differently 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 recorded during the British Agricultural revolution Overton (1996). 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 crop farmers and livestock keeping communities.

Ultimately, domestication of plants in turn domesticated man. Man had to stay in one place, plant, nurture and wait for the crop to mature. Man had to take time and study plant and animals, domesticated their behavior patterns in health and in response to varying weather conditions including in sickness. 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 land demarcation to political territoriality, discovery of mathematics, survey and geometry which became handy to land distribution and record keeping (Geoffrey, 2015). Further, land domestication was enhanced through application of organic manure to enrich the soil. During the Islamic golden age for example organic manure and legume plants were used to replenish fertility by increasing nitrogen content to the soil Overton (1996). When commercial fertilizers was used later including crop rotation, for example in Britain between 1939 and 1951 yields increased Overton, (1996). 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 fertility.

4.2 The Middle Ages and Agricultural Revolution in Europe and Islamic World

Comparative to Neolithic revolution, medieval Europe's agriculture revolution was marked by both significant improvement but also 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 Peacock, (1982). At the top was the King, followed by nobles (who owned large parcels land) 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, Peacock (1982). 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 (Richard, 2015). Agricultural workers in Medieval Islamic world were not treated as 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.

4.3 British Agricultural Revolution (1700 – 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, 1996).

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 him about ten millenniums to get there. British agricultural revolution entailed both selective breeding of livestock and cropping and the removal of common property rights on land which had characterized medieval Europe (Overton, 1996). 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 first industrialized England, then British 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 cereal seeds, farm technology, use of chemical fertilizer, better irrigation and technological transfer that revolutionised agricultural sector in India which helped about a billion people from starvation (Jiggins, 1986)

4.4 Genetically Modified Food revolution (GMO)(

The most recent yet most contested agriculture revolution today is genetically modified food revolution, It is interesting to learn however, that the fears displayed today regarding Genetically Modified food were similar challenges that Neolithic agriculturists faced 10000 years ago. This is evident in the fact that alongside sedentary agriculture Neolithic farmer hunted and gathered to safeguard himself against ever increasing threat of hunger. In South Africa where GMOs started in 1997, the situation has not been rosy. Studies have revealed shortcomings including ecological risk and difficultness in cultivating GMOs and non- GMOs together in small rural farms Daily Nation, (Sep 22, 2015).

In conclusion therefore, the agricultural revolution is the longest and most dynamic, having started 10000 years ago it is ongoing. 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 or animal will take before maturation. In all agricultural revolutions, noted conspicuously is the clear cut division between worker on the farm and the owner of the land.

5.0 Challenges to Agricultural

Revolution and Social Integration

Prior to agricultural revolution women and men of Hunter-gathering societies worked side by side though women were granted greater status Boulding, (1995). Women also gathered fruits and nuts with the help of the children. Boulding, (1995). 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 dictated in agriculture to get the necessary work done. Similarly when digging sticks were replaced by animal drawn ploughs women were no longer the primary workers of the field Boulding, (1995). 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 challenges that new technology was often heavier and difficult for a woman to wield, made it unnecessary and impractical, and women were relegated to other roles in society. To supplement the family's income, many women went into cottage industries as others became domestic servants Boulding, (1995).

As well, during the Green Revolution though marked by great success in terms of increased agricultural output the data from India indicated that agricultural modernisation increased the demand for agricultural labor. However, wage rates remained static with scanty employment opportunities. Within this bleak employment scenario in a patriarchal society, women were paid lower wages than men and were often assigned labour- intensive tasks such as weeding, transplanting and harvesting. (Jiggins, 1986)

As colonialism was entrenched into Africa, in Kenya in particular, the importance of women's agricultural contribution to the household was reduced as their vital role in food production was overshadowed. Northey Circular of 1919 for example commanded district officers and African chiefs to procure women labour for private and public works Opolot (2012). 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 but 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).

Similarly, 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, labour 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 which excluded women

completely. The Swynnerton Plan of 1954 began a process of, 'registering and consolidation of land in Kenya 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.

Whereas in foraging societies children had no responsibilities beyond feeding themselves and learning the hunting and foraging skills they would need, 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 kept them out of the planted areas Boulding, (1995). 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, agricultural production turned into punishment. Reversal of the state of affairs involved another revolution which liberated the serfs as was exemplified in French revolution of 1789.

During Trans Atlantic slave trade of (1450 to 18th century) 12 million Africans men, women including 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.

During colonisation of Africa by the Europeans, African labour was forcefully acquired to work on European plantation (Khapoya, 2012). Such background negatively reinforced agriculture as oppression. In part, this explains why both agriculture trained and non-trained youths engaged agriculture as a last resort. In essence though agriculture was the base upon which African economy depended yet vast majority of the youths were not in the industry. In Sub-Saharan Africa for example by 2005 there were 257 million youths and their population was expected to grow at 9.7 million annually, Ngongi (2015) yet agriculturally sterile hence exclusion of youths risks plunging Africa into never-ending food insecurity.

6.0 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). Additionally, over and above agricultural training at higher education, trainings in marketing, business, policy making, engineering and finance should be undertaken inclusively in order to harvest an all round equipped, employable trained agricultural personnel. Curricula reviews in agriculture training should be enhanced to accommodate quality and practical skills Ngongi (2015). People with

disability should be included in development strategies and training. It is important that policies of people with disability were implemented, (Tiina, 2011).

Youth, women and those people with disability should access land without discrimination. This can be achieved by ensuring that vulnerable groups were either directly or indirectly involved in enactment of land laws which should provide access to land by all. Skewed discriminatory traditions, customs and norms that go against women, youths, people with disability, should be subordinated to all inclusive non discriminative international or state laws that enhance observance of human rights, deter discriminatory inheritance rights, provide inclusive security of land tenure. Land policy reforms should take into consideration views of women, youths, the poor and people with disability. Tiina (2011).

Financial accessibility by the youths, women, the poor and people with disability 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 as a result the vulnerable groups with common interest should form groups which in turn would work as collateral to secure loans.

Associating agricultural production with oppression, punishment or dirty profession should be countered by investing in agriculture, support agricultural innovation and improve agricultural business. (Ngongi, 2015)

7.0 Study findings;-

The study findings were as follows; 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 with regard to practicing agriculture and finally agricultural revolution has been a vehicle for knowledge, industrial revolution, human, plant and animal domestication.

7.1 Conclusion and Recommendations

In conclusion, agricultural social inclusion is a catalyst to sustainable agricultural revolution for rural and urban development. The study recommends adoption of policies that capture social inclusivity, bottom -up approaches to agricultural revolution, affordable and appropriate technological innovations that are in tandem with consumer needs.

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