

A review of gender and technologies: case of central Uganda

Abstract

Although different technologies are developed and used by both men and women, less has been done in the analysis of gender consideration during technology development. As economies reposition themselves to compete in the global economy, the gender gap in technology development and adoption has caught the attention of planners. When projects include gender sensitive components the ability to defend the interests of women and men can be increased. The objective of this paper is to develop a strategy of gender incorporation in technology development. A literature review of case studies was done. In conclusion, the development of technologies is generally not based on a comprehensive analysis of gender roles. Additionally, technology development projects do not offer equal participation of both genders during execution of technology development projects due to the fact that on addition to productive activities, women also dedicate some of their time to reproductive activities in their families.

Keywords: technology, gender, women, men

Volume 4 Issue 1 - 2020

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Received: November 16, 2019 | **Published:** January 02, 2020

Introduction

Technology refers to simple tools in addition to complex products and processes.^{1,2} Gender refers to roles, duties and prospects of girls and boys or men and women that are generated in families, societies, cultures as well as the expectations detained about the features, abilities and likely behaviours of both women and men.³⁻⁵ For example, the expectation of men to be heads of families and women to be caregivers is a sexual role norm in central Uganda. In addition, women in central Uganda are not expected to ride bicycles. Sex conversely refers to organic differences amid men and women,^{6,7} stipulates that an individual is a male or female regardless of race, class or age. In his study,⁸ states that there is increasing recognition that society is characterised by a male bias, where the male norm is taken as the norm for society all together, which is imitated in policies and structures. Consequently, male supremacy and female relegation is found in greatest scopes of life, technology development and use inclusive, and the tasks, roles, functions and values attributed to men are usually extra valued compared to those related to women.

Relative to other issues of women in development, issues of gender in science plus technology are newcomers to the international stage.⁸ Technology significantly promotes long-term economic growth, and in building a base for a science-based knowledge society,⁹ state that the most gain will come from delivering technologies in developing countries. In my opinion however, delivering technologies in developing countries alone may not be enough, the technologies delivered should be economically reachable and willingly dispersed. For years, scientific and technological progressions have helped farmers in the industrial biosphere by driving agriculture production. However, smallholder farmers who are mostly women, have no right of entry to most of the tools required to be successful, like up-to-date irrigation methods, crop management products, manures, postharvest loss way out, better seeds, movable technology, and access to information and extension services.¹⁰ The potential to advance women economically

may be the most exciting transformative feature of technology.¹¹ If women are economically backward, they may not have the financial ability to acquire and use technologies for their activities. This may be due to the fact that little is recognized about gender variances in terms of resource access, ownership and use during introduction and adoption of technologies that improve productivity. Despite the fact that women tend to adopt improved technologies at a lower rate paralleled to men,^{12,13} research on technology, together with social shaping research, has been 'gender-blind',^{14,15} hence failing to address such problems. In my view, studies on technology adoption rates and use should be undertaken such that findings are used to develop gender specific technologies. Additionally, the virtual prohibiting of women from greatest areas of technological research and design, and the fact that it is chiefly men who make improved technology are mainly ignored. The objective of this paper is to develop a strategy of gender incorporation in technology development.

A literature review of case studies

Gender analysis

Gender analysis is an orderly logical procedure for recognizing, comprehending, and labeling gender variances and the significance of gender characters and power changing aspects in a specific context.¹⁶ It involves the assortment and usage of sex-disaggregated data that reveal the roles and tasks of women and men.⁸ Gender analysis aids in understanding the associations between men and women. When gender analysis is done, associations like which gender does which activity and what technology requirements do they need is easily identified. Weighing the relationship makes it promising to determine men's and women's constraints and opportunities. Furthermore,¹⁶ states that gender analysis aids to better understand the opportunities/problems in the community and plan involvements which are useful to both women and men. It helps to uncover obstructions to women's full participation and economic development. It also guides in decision

making and applying projects that promote gender equity and finally helps to discover the finest approaches and solutions for addressing the diverse needs and dynamics of men and women living in poverty.

Gender analysis during technology development would require technology need Identification. Gender needs arise due to the fact that roles of men and women differ. Men and women do different kinds of work, have unlike levels of access to services and resources, and experience unequal relations.¹⁷⁻¹⁹ Thus various technologies are needed by both men and women to perform their respective tasks. Technology needs fall under practical and strategic gender needs. According to Biruktayet & Nina,¹⁶ practical gender needs refer to people's basic needs for their day-to-day survival which may include the provision of services such as clean water, shelter and health care, and income generating opportunities where as strategic needs refer to the comparative status or position of women and men in hunt of enablement and equity and these may comprise of lawful privileges, amplified decision making, and protection from domestic violence.

Gender integration in technology design

Though technologies themselves are gender blind/ neutral, technology developers often become biased towards one sex during project formulation and implementation.²⁰ This is because little is understood by planners as no account is taken of who participates in the production process and to what extent. Normally the improvement of these technologies is not based on a comprehensive analysis of gender roles,²¹ and as a result they do not offer identical openings for women and men to partake and benefit. Women's exclusion from technology work has always been a key focus in research on gender and technology.^{22,23} Gender integration according to FHI,³ are approaches used in program forecasting, evaluation, design, application and Monitoring & Evaluation to consider gender norms and to pay compensation for gender-based inequalities. For example, when a Technology development project conducts a gender examination and incorporates the results into its objectives, work plan and M&E plan, it is undertaking a gender assimilation procedure. When projects include components specifically designed for women for example the Shea butter project in Uganda, their political power and ability to defend their interests can be increased.²⁴ It should be noted that women face many barriers in societies and these according to Gender Tool Box²⁵ consist of poverty, illiteracy, time scarcity, limitations of movement and traditional and religious forbids. Therefore, the significance of Gender Planning and Development relates to the fact that technology development policies, due to wrong assumptions, frequently discriminate against or misses women.²⁶ Gender integration in design of technology basically involves gender mainstreaming. According to McGregor,⁸ gender mainstreaming is the process of bringing a gender viewpoint into the mainstream activities of government at all levels, including in rules, programmes and projects. However, the Swedish Secretariat for Gender Research,²⁷ defines gender mainstreaming as the re-organization, upgrading, growth and assessment of policy processes, such that a gender equality viewpoint is combined in all policies at all levels and phases, by the actors involved in policy-making. In my view, in the setting of gender and Technology, mainstreaming can involve development of technologies so that they promote gender equality, technologies and procedures that do not distinguish people on sex/gender basis; and that are in the same way available to all regardless of sex/gender and other power establishments. Gender mainstreaming is goal oriented and in the end purposes to reinforce the power of women and men to figure society and their own lives.²⁷ Ideally, the purpose of Technology

gender mainstreaming is to change the Technology growth and usage structures that have discriminating effects on women and men as groups.

Strategies for gender integration in technology design

Gender integration in technology design involves gender-sensitive planning which is a differentiated planning culture that employs a gender group-specific method. Several studies on gender and program planning have been performed over the past several decades. For example Sandercock & Forsyth,²⁸ stated that traditional planning seldom considers gender issues. However, Damyanovic, Reinwald, & Weikmann,²⁹ concluded that the supplementary value of gender incorporation in planning manifests at several levels as follows:

- A. Quality assurance in planning progressions: Gender-sensitive scheduling puts into consideration the needs of the often overlooked people. Thus gender, age and group-definite interests and effects are analytically scrutinized in connection with each new planning task and step.
- B. Targeted resource use: gender-sensitive planning also looks at the impartial distribution of time and resources. The usability and functionality of a technology are especially measured by its usefulness for people and together with gender budgeting, the circulation effect of the resources invested can therefore be evaluated and visibly controlled.
- C. Exchange and communication of know-how: The reflection on the underlying values of technology design from a gender-sensitive perspective supports a planning culture informed by daily needs and encourages greater consciousness of the various daily needs of women and men relative to life phases, realities, cultural and social backgrounds.
- D. Methodological innovations and methodological evolution: The sensitization for gender-sensitive issues in the perspective of a systematic exchange of experience between different divisions and disciplines of technology development supports the evolution of interdisciplinary planning know-how. In this way, Planners' scopes for action become visible. New scheduling issues and tactics often high spot "blind spots" hence calling for novel methods.

Gender issues in design and technology

Even though gender variances in many cases are small and their greatness may vary by country or age, a steady pattern arises.^{30,31} According to Kirk,³² gender issues are of three different facets; authentic (i.e., they exist because there are gender differences), synthetic (i.e., they have been fabricated by an unnatural socialization process created by a world view that men are dominant and women are submissive) or fantastic that the whole issue diverts us from concentrating on fundamental issues needing correction in modern education. Wajcman, (2000); Rogers,^{33,34} suggest that the contemporary emphasis on cultural representation and intake has contributed to the abandonment of design studies. In my view however, design studies should embrace gender issues at all stages of technology development.

Gender and technology adoption

Several studies,^{35,36} suggest that technology adoption depends on an individual's attitude toward using a technology which reflects instrumentality and extrinsic motivation to use technology. Additionally, a recent study by Ratchaneewan et al.,³⁷ on adoption

of irrigation technology indicated that gender remained statistically insignificant regarding to the adopted irrigation technology. However, due to differences in norms, beliefs and customs of various cultures, different technologies are either not used or are taken up at very slow rates. For example, Lubwama³⁸ states the following factors that affect technology adoption:

Culture and tradition is a long standing phenomenon that has significantly affected the taking on of most agricultural technologies. Some technology practices are not well-matched with certain communities' cultures and traditions. A typical instance is the use of a bicycle mechanism to drive a machine. Women in central Uganda are not permitted to ride a bicycle yet the use of electrically powered machines has failed to gain ground due to high costs associated to them. Therefore, any technology that is designed having a bicycle pedal system will only be used by men in central Uganda. The adaptableness of appropriate implements, tools and on-farm research technology, are all affected by the obtainability of finances. Farmers access to production inputs and farming tools and implements hinge on their access to credit. Many Micro finance institutions in the country practice some sort of rural credit scheme to assist smallholder farmers improve their agriculture. However, in most cases these are located in cities and bigger towns, far from the farming community and where there is ease of access, the lending rates are too high standing at 22 - 27%.

Also, gender mobilisation and awareness is also a very important factor in the technology adoption process. Irrespective of the type of technology, there is a considerable amount of mobilisation which has to be done to prepare clients for the technology adoption process. Before one decides to adopt a technology, he or she must know of its existence, understand its uses and relevance, feel confident about its use and maintenance, and be able to afford to buy and run it. Women, however, possess far less access to the necessary facts than men because of their low education and status in society.^{39,40} In their research on gender and technology adoption, Venkatesh & Morris,³⁵ revealed that men consider perceived usefulness to a greater extent than women in making their decisions regarding the use of a new technology, both in the short- and long-term. Besides, apparent ease of use was more salient to women than men both after initial teaching and over time with increasing familiarity with the technology.

Ownership of property affects the adoption process of mostly Agricultural Technologies in Uganda. Agriculture depends on availability of land as a major resource. However, women who are the major participants in Agricultural activities own less land and also have less access to land. As well, the United Nations Human Rights,⁴¹ women make up on average less than 20% of the world's landholders, with an estimated 43% of the agricultural labour force and in sub-Saharan Africa, 60 to 70% of employed women work in agriculture. This limits women's level of adoption of agricultural technology, they are even hesitant to acquire such technology since they cannot guarantee access to land for agriculture in the next seasons. Additionally, property rights in Uganda are discussed in the perspective of land, with little written about women's privileges and access to all other forms of assets such as agricultural equipment, livestock, and savings and credit Doss,⁴² yet these are also important aspects in development. However, according to Birungi et al.,⁴³ in the 1995 Constitution of the republic of Uganda, the Land Act and other land laws clearly provide for promotion and protection of the land rights for women including the rights to own and inherit land. Nevertheless, even with such an enabling legal environment, there

is still a pronounced discrepancy between law and practice (Doss, 2010).⁴² Customary practices in central Uganda carry on to override statutory law in recognition and implementation of women's land rights, for example women are not supposed to inherit land in central Uganda.

In my own opinion, technology adoption in Central Uganda is as well affected by the following factors:

- a. Relative Advantage; How much more superior and beneficial the new notion or practice is compared to what is currently being used.
- b. Compatibility; is how well an innovation fits with the society's " socio-economic, cultural and environmental situation.
- c. The complexity- If the invention is very difficult to use people are more likely not to adopt it. Also if it is too complex to comprehend or appreciate, users might fail to understand it and are likely to reject it.
- d. Trial ability- if a user has a hard time using and trying an innovation this individual will be less likely to adopt it.

Gender differences in technology access and use

A sequence of factors, including literacy and education, language, time, cost, locality of facilities, social and cultural norms limit women's access to technology.⁴⁴ The yield of labour will be changed due to accessibility of the technology among men and women. In most small-holder farms, technology is mostly at the disposal of men while 70% of agricultural production is contributed by women.³⁸ Thus gender and technology discussions raise questions of whether the technologies are gender blind, hindering of women participation or not addressing a gender concern. Several studies ⁴⁵⁻⁴⁷ suggest that males hold more favorable attitudes toward technology use than females.

Analysis of literature

Since gender analysis aids in understanding the associations between men and women, it makes it possible to identify their roles in a given society, level of participation of each gender in a particular activity that needs use of a technology and why one gender does not actively participate in the use of such technology. In my opinion therefore, gender analysis must be undertaken at all phases of technology development which include identification and planning of technology, formulation, application as well as monitoring and evaluation as illustrated in Figure 1. With consideration of all the factors that affect technology adoption together with customs and norms followed in central Uganda, the technology adoption model in Figure 2 is suggested if gender fairness in technology adoption and use is to be manifested.

Though technology development institutions have selectively focused on largely masculine world of technology design, the prevalence of women has gone un noticed. They have moreover failed to see women's involvement in making and use of many technologies. There is clear need therefore, to have an institutional framework that considers the social and economic situations of the area and consideration of gender within which the system the technology will be adopted. While feminist approaches have had considerable influence on mainstreaming science and technology, tensions remain. Therefore Technologies under development must consider gender needs. Government and research institutions should

make special effort to allocate financial resources to the study of the problems relating to the impact of technologies on women and agricultural processes in which women along with men are direct beneficiaries. I suggest that the Technology development work should be managed from the top of the organization and implemented within the framework of the existing organizational structure then through the organisation's regular processes. There should be consciousness

of the need for and a readiness to implement certain technologies in order to ensure impact across the society sustainability of technology development work. I further propose that the modern focus on cultural depiction and ingestion, exciting and productive as it is in many respects, contributes to the lack of care of design studies. These are necessary to fully clarify how gender associations figure in technology construction.

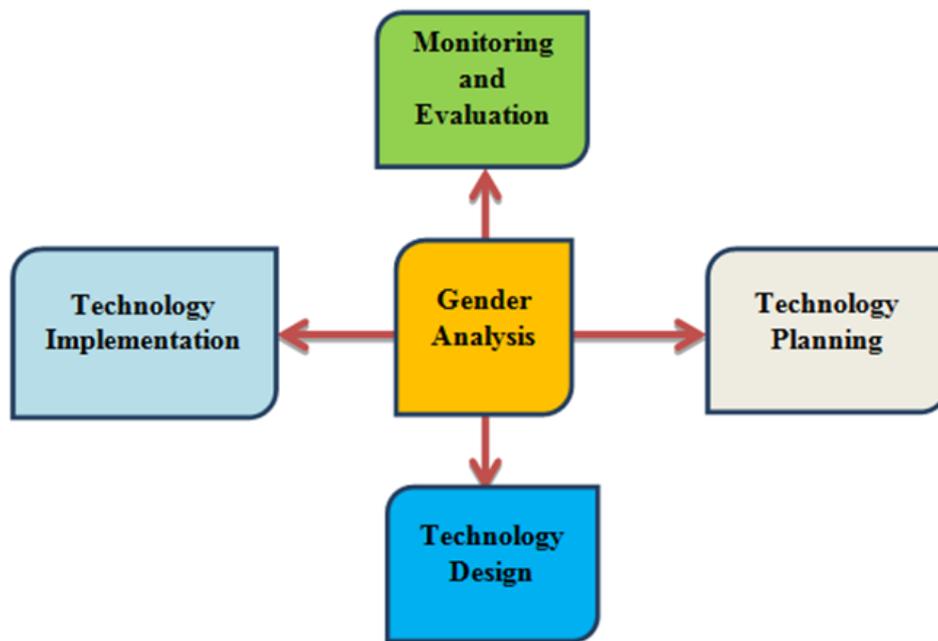


Figure 1 Schematic diagram of gender analysis in technology development.

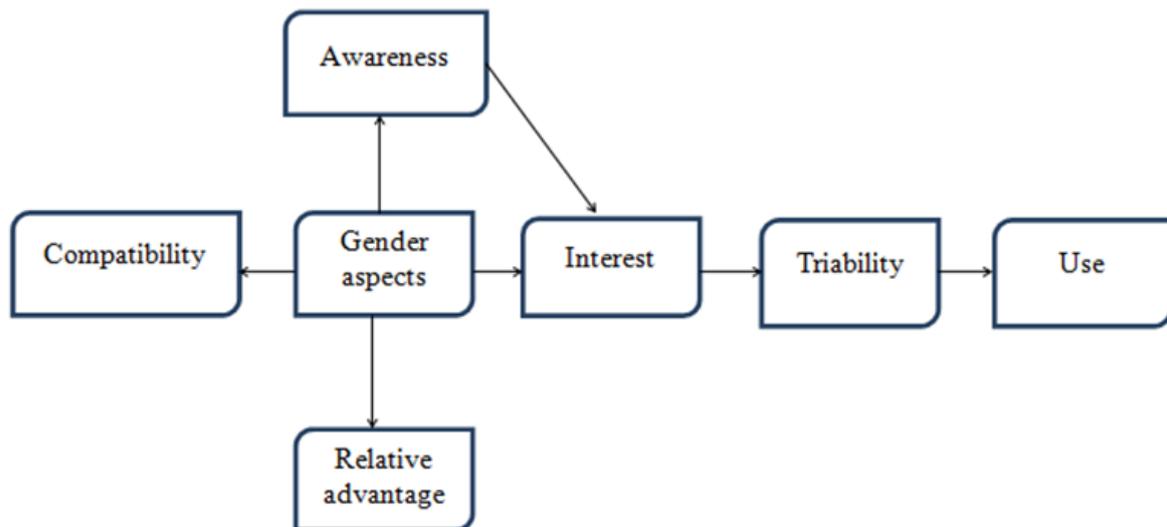


Figure 2 Technology adoption model.

It must, though, be esteemed that since cultures submerge women more than men in most communities, any effort to increase the levels of technology for women requires a distinct strategy to accelerate their access to inventions. This possibly will include provision of female

extension staffs for specific tasks in diffusing technology innovations because when men teach women usage of a new technology, they often find them slow to learn.

Conclusions

In conclusion, the development of technologies is generally not based on a comprehensive analysis of gender roles. Additionally, technology development projects do not offer equal participation of both genders during execution of technology development projects. Inequalities in participation of both genders during technology development projects may be due to the fact that on addition to productive activities, women also dedicate some of their time to reproductive activities in their families.

Acknowledgements

None.

Conflicts of interest

The author declares that there is no conflict of interest.

Funding details

None.

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