

Socio-economic and gender issues affecting the adoption of conservation tillage practices

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Abstract

Gender and socio-economic issues cut across all areas in agricultural production. Therefore, there is a need to know how development policies and programmes are likely to affect the economic activities and social relationships among different groups of people in a community. Although conservation tillage technologies are gender neutral, they often become biased towards one sex during project formulation and implementation in farming systems if plans are not gender sensitive. Technology development and transfer should aim at equal opportunities for women and men to participate and benefit. The paper highlights the importance of taking into account gender needs when designing and transferring agricultural technologies as men and women are physiologically different and their needs should be given their respective study and other development attention. Socio-economic issues which can affect the adoption of conservation tillage practices are discussed.

1. Introduction

Worldwide, conservation tillage practices have been the general solution to the traditional crop production methods that invert the soil and destroy its structure. Conservation tillage has been practised by many farmers worldwide as a traditional method to sustain soil fertility and reduce tillage energy requirements. A lot of advantages have been realized in agricultural production with the conservation tillage concept, which have greatly increased production worldwide. For example, in Uganda, like in many countries in East and Southern Africa, conservation tillage practices have increased crop production especially in the dry-land areas through the increase of stored soil water and minimized labour, energy and capital requirements in agricultural production.

However, despite the popular campaign for the adoption of conservation tillage practices in the region, the move has at times been hampered by several issues which include socio-economic and gender ones (Box 1).

Box 1: Basic definitions

Socio-economics

Socio-economics refers to environmental, economic, social and institutional patterns, and their linkages that compose the context of development (Huisinga, 1997). Social and economic factors at various levels of social systems form an environment where people interact through roles and relationships defined by gender, age, ethnicity and other social variables.

Gender

Gender refers not only to women or men *per se*, but to the socially defined roles of each sex, as well as to the relation between them. Gender issues, therefore, form part of the development approach that puts people at the center and ensures their participation in the entire development process.

Conservation tillage

Conservation tillage is the concept of farming technology designed to minimise tillage operations hence minimizing soil disturbance and increasing soil structure build-up and organic matter in the soil.

2. Conservation tillage practices

The aim of conservation tillage is to maintain maximum residue cover for protecting soil against erosion and increasing water infiltration without reducing crop yields. Conservation tillage practices, therefore, include:

- Soil cover management;
- Weed management;
- Soil and water conservation.

The activities required for soil cover management involve mulching and planting cover crops.

Weed management involves application and use of:

- herbicides,
- mulching,
- mechanical weed control,
- hoeing and
- agronomic crop management;

while soil and water conservation activities involve:

physical measures:

- terraces,
- bunds and
- basins),

biological measures:

- tree planting,
- rotational grazing and
- cover crops

and agronomic measures:

- crop rotation,
- early land preparation and planting,
- proper spacing,
- early weeding,

- disease and pest control and
- fodder cropping).

All these activities pose various constraints which have a direct bearing to the adoption process of conservation tillage practices. Some of the constraints encountered in soil cover management activities include:

- cultures and traditions,
- knowledge and perception and
- competitive uses of crop residues.

Those pertaining to weed management activities include:

- availability of suitable inputs and implements,
- lack of knowledge and adequate support services

while those pertaining to soil and water conservation include:

- inappropriate technologies,
- inadequate technology dissemination,
- labour availability and cost,
- low management skills,
- insecure land tenure systems and
- availability of suitable implements among others.

The technologies involved in conservation tillage can be analysed under two scenarios which have a close bearing to the adoption process of the technology: socio-economic and gender. Gender and socio-economic issues cut across all areas of concern in agricultural production. This is because men and women farmers share many characteristics, but often have different constraints and production systems.

Under the socio-economic aspect the main issues are those pertaining to credit facilities, ownership of property or assets, culture and tradition. The issues of concern under gender and technology are whether the technology in question gender sensitive. Involvement of women and men in farming, the constraints on their productivity, their intra-house division of labour and responsibilities, the control and use of income have widespread implications for agricultural production.

3. Socio-economic issues affecting adoption

3.1 Financial facilities

3.1.1 Credit

The adaptability of suitable implements for conservation tillage, on-farm research technology, among others, are all affected by the availability of finances. Farmers access to production inputs like improved varieties of cover crops, herbicides and farming tools and implements depends on their access to credit. A number of countries in the region practice some sort of rural credit scheme to assist smallholder farmers improve their agriculture. In most cases the banks handling the credit fund are found in the city and larger towns, away from the farming community. Accessing such credit for agricultural purposes have proved difficult for small-holder farmers. Where there is accessibility, the interest rates have tended to be too high for farmers to afford. In Uganda such interest rates stand at 22 - 27%.

Formal banking institutions also demand collateral to act as security on the loan. This is often in form of land, house or title to some immovable assets. Smallholder farms in many countries in the region often cannot afford any of the above requirements. The situation is often more difficult when it comes to the women, who in most countries, have no rights to ownership of expensive property including housing and land. For example although about 97% of Ugandan women have access to land, only 75% actually own it and 8% have leasehold, yet land is the most suitable form of collateral. Since few women own land, the remaining majority have restricted access to bank loans.

Failure to access soft loan and credit for agricultural activities and inputs have a severe bearing on technology adoption. Not only has credit affected availability of production inputs but also labour requirements. Additional costs and labour are normally required to introduce a given conservation tillage practice, especially when constructing soil and water conservation structures.

There is, therefore, a need to evolve effective credit delivery systems and develop affordable packages of agricultural technologies. Policy makers should be involved in farmer programmes so as to convince them to invest in

these agricultural technologies. Besides, farmers or farmer groups should be used to assess farmers' credit needs.

3.1.2 Import taxes

In most of the countries in the region, agricultural inputs (tools, implements, fertilizers, chemicals etc.) are handled by local entrepreneurs and stockists for sale to farmers. Import tax regulations are often not favourable on agricultural inputs. In most countries in the Asian continent, (e.g. India, Thailand, Philippines etc.) one of the biggest contributors to agricultural development has been through providing favourable tax incentives on agricultural inputs. In these countries, taxes on agricultural tools and machinery are much lower compared to public service and industrial equipment range. Similarly, there is a lower tax on fuel and lubricants for use on agriculture compared to other fuel avenues.

Failure in recognising need for tax differentials in respect to agricultural inputs, has resulted in farmers low access to such agricultural inputs. This has consequently resulted in low technology adoption. There is, therefore, a need for governments to review the tax policy on importation of agricultural inputs.

3.2 Ownership of property

Ownership of property or assets has also affected the adoption process of conservation tillage practices. Land ownership is the key factor to all conservation tillage practices. In many parts of the region, communal ownership is still dominant. The several land tenure systems existing in the various parts of the region, greatly affect the adoption conservation tillage practices. Some of these systems encourage land degradation through the communal use of land such as free grazing of animals.

Some conservation tillage practices like rotational grazing and cropping, proper spacing, among others, require reasonable areas of land for effectiveness. The current land ownership system has promoted land fragmentation hence reducing the available land for effective adoption of conservation practices.

Ownership has also affected accessibility of agricultural implements like hand tools and draft animals. Like land ownership, this has had great

effect on women more than men as in most communities women do not have ownership of any property. It must, however, be appreciated that throughout the development of agriculture, women have played a significant role to the continuity of farming systems. Therefore, in view of this ownership issue, community organisation or farmer organisations for production and conservation is one of the strategy to accelerate the adoption process.

3.3 Culture and tradition norms

Culture and tradition is a long standing phenomenon that has greatly affected the adoption of most agricultural technologies. Some conservation tillage practices are not compatible with certain communities' cultures and traditions. A typical example is the use of draft animals in some communities. The value attached to cattle in some communities cannot permit their use for traction yet the adoption of donkeys has also failed to gain ground in some of these communities due to fear of the animals.

Training and exposure to the successful stories of agricultural technologies can help to break the long time culture and tradition phenomenon. It must, however, be appreciated that since cultures bog down women more than men in most communities, any effort to increase the levels of technology for women requires a special strategy to facilitate their access to innovations. This may include provision of female extension workers for specific tasks in diffusing technology innovations because when men teach women to use a new technology, they often find them "slow" to learn.

4. Gender and technology

4.1 Technology neutrality

Effective application of agricultural technologies in production has strategic gender implications. The productivity of labour will be altered depending on accessibility of the technology between men and women. In many small-holder farms, technology is mostly at the disposal of men whereas women contribute 70% of agricultural production. So when we talk of gender and technology, the questions that arise are whether the technologies are gender neutral or blind, hindering of women participation or not addressing a gender concern.

Though technologies themselves are gender neutral, they often become biased towards one sex during project formulation and implementation. This is because little is understood by planners. Though research has come up with wonderful conservation tillage technologies to increase production, many times they have not all been adopted. The social and economic conditions in which the activity is being carried out determine the lack of neutrality in the process of technology selection and adoption.

The lack of neutrality is apparent not only from the social and economic perspective, but to a much greater extent, from the perspective of gender in that, no account is taken of who participates in the production process and to what extent. Conservation tillage practices, especially those pertaining to Soil and Water conservation, do not promote the fair participation of both women and men. Normally the development of these technologies is not based on a comprehensive analysis of gender roles and as a result they do not offer equal opportunities for women and men to participate and benefit.

There is a clear need, therefore, to have an institutional framework that takes into account the social and economic situations of the area as well as consideration of gender within which the system the technology will be adopted. Conservation tillage technologies under development must take into account the needs of the gender. Government and research institutions should make special effort to allocate financial resources to the study of the problems relating to the impact of conservation tillage technologies on women and agricultural processes in which women along with men are direct beneficiaries.

4.2 Gender mobilisation and awareness

In the process of technology adoption, irrespective of the type of technology, there is a considerable amount of mobilisation which has to be done to prepare clients (farmers) for the technology adoption process. This process involves:

- Joint planning between technology development agents (researchers), farmers (clientele) and a variety of technology uptake pathways (extension agents of various types);

- Joint on-farm testing of the technology involving the above partners;
- At the dissemination stage, a number of undertakings have to be effected: sensitisation, training, use of extension materials including manuals, brochures, leaflets etc., to effect demonstrations.

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, have far less access to the necessary information than men because of their low education and status in society. Education and training programmes have favoured the male. Women in most rural areas have low education levels and more are illiterate compared to men.

Consequently, this affects the way they can appreciate messages on technology adoption. Even those women who have some level of education often find it difficult to access relevant literature on extension and are therefore disadvantaged when it comes to technology adoption.

Women in rural areas often have heavy work loads and schedules ranging from household chores to farm work and non-agricultural activities outside the households. Quite often they have little time to participate in different fora and associations for development and more so, for accessing technologies.

Programmes on appropriate technologies normally aired through mass media (radios, newspapers, TVs) do not often reach the women since such programmes are aired at times when women are busy and unavailable. They, therefore, miss chances of new innovations and work methods. This grossly affects technology adoption by women.

This author, a lady engineer using own experience notes: My work in research, training and technology dissemination has mainly involved men because of the above constraints which affect the women. There is need for affirmative action to go all the way to ensuring direct participation by women if technology adoption is to benefit from women's input. If these issues are left generalised, women

contribution in technology adoption will always lag behind and society will do little in terms of women contribution to the overall development.

5. Conclusion

Since gender and socio-economic issues cut across all areas of concern in agricultural production, there is a need to know how development policies and programmes are likely to affect the economic activities and social relationships among different groups of people in a community. Farmer research needs should clearly be addressed with the end users at the centre of these research and affordable packages of conservation tillage technologies developed for specific recommended domain.

Although conservation tillage technologies are gender neutral, they often become biased towards one sex during project formulation and implementation in farming systems if plans are not gender sensitive. Technology development and transfer should aim at equal opportunities for women and men to participate and benefit. It is important to devise technologies that take into account gender needs when designing and transferring agricultural technologies as men and women are physiologically different and their needs should be studied separately.

The establishment of an adequate data base through research on available conservation tillage technologies to determine relevance to farmers is urgently needed. For this, researchers and extension staff should evaluate the problem of available technologies with farmers who use them.

Lastly, very few men have been bold enough to say that science and technology has not been fair to women especially those in rural areas. There is a risk, however that the perception of a female threat to male power could evoke new barriers.

Technology offers women new opportunities to close the gender gap in physical strength. The utilisation of technology in developing human and material resources can be dramatically enhanced when women are included, since they are responsible for 50 - 60% percent of agricultural production and most domestic tasks.

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