

Impact Assessment of Chickpea Research and Development in Ethiopia

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Introduction

The climatic conditions in Ethiopia make it very suitable for growing chickpeas. Chickpea is widely grown across the highlands and semi-arid regions of Ethiopia and serves as a multi-purpose crop. The country is also considered as the secondary centre of diversity for chickpea. It has a major role in the daily diet of the rural community and parts of urban population. The crop is being exported to Asian countries and is contributing positively to the country's foreign exchange earnings. Currently, chickpea is cultivated in four regions of the country, Amhara, Oromia, Southern Nations, Nationalities and People's Region (SNNPR) and Tigray. Amhara and Oromia regions together produce 93% of total chickpea production in Ethiopia while SNNPR and Tigray produce 3.5% and 3%, respectively. In future, chickpea can also be grown in other regions such as Benshangule, Somali, Afar and Harar. Thus, the area coverage and the importance of the crop in the country are expected to increase in the future.

The ability of Ethiopia's chickpea sector to foster economic growth and development depends on the country's ability to improve productivity, enhance grain quality and consistently supply the required volumes of market-preferred products at competitive prices. More than ten improved chickpea varieties have been released. But until 2004, insufficient seed production limited the availability of quality seeds and the adoption of improved varieties was low. In the past decade various initiatives were started to accelerate the adoption of improved chickpea varieties in Ethiopia. The Ethiopian Institute of Agricultural Research (EIAR) cultivated partnerships with major actors along the value chain to support the adoption of improved varieties. The Debre Zeit Agricultural Research Centre (DZARC) started work on chickpea research in 1972 and was followed up by active participation of research centres of the Amhara Regional Agricultural Research Institute (ARARI) and the Oromiya Regional Research Institute (ORARI). From 2007, a number of national and international research institutions have now been actively involved in the development, release, and promotion of improved chickpea varieties in Ethiopia. The International Center for Agricultural Research in Drylands (ICARDA) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) provided genetic materials used in the breeding program, elite materials ready for release and technical assistance in the entire breeding cycle. Most of this research has focused on identifying high yielding and disease resistant varieties suitable for the diverse agro-ecologies of Ethiopia.

The Tropical Legumes II (TLII) development program has conducted various chickpea research and development activities, including the establishment of seed grower associations. TLII focused on major chickpea producing areas in the Shewa region for the upscaling of suitable chickpea varieties and marketing strategies. Other developments that boosted the chickpea sector included the decision to include chickpea in the Ethiopian commodity

exchange and formation of the multi-stakeholder EthioPEA alliance. Co-operatives received breeder seed and multiplied them using contract farmers to enable the dissemination of improved chickpea varieties.

Results

Smallholder farmers in the study area plant larger areas to Kabuli chickpea types relative to the other two types. The area planted to Kabuli was 0.09 hectares higher than traditional varieties ($p<0.05$) and not significantly different to Desi chickpeas. With regards to production and yield, Kabuli chickpea had higher production and productivity compared to Desi and traditional varieties. On average, Kabuli chickpea produced 486kg more than desi varieties ($p<0.05$) and 536kg higher than traditional varieties ($p<0.001$). These results demonstrate that Kabuli varieties are predominantly high yielding in Ethiopia and resonate with earlier findings from other studies

The results show that East Gojjam, South West Shewa, Eash Shewa and North Shewa are the major improved chickpea growing zones. Over 60% of farmers in these zones are growing improved chickpea. These results show that Amhara and Oromia regions are the leading improved chickpea producing areas in Ethiopia. Elsewhere there are reports of high adoption rates in the Shewa zones of Amhara and Oromia regions where chickpea technology transfer work has been extensively promoted.

There is evidence of systematic differences in input use, production and productivity between improved and traditional chickpea production in Ethiopia. Agricultural inputs were divided into four groups: seed, fertilizers, chemicals (insecticides and pesticides) and hired labour. The average level of use of all inputs was significantly higher in improved chickpea plots. For example the use of hired labour in improved chickpea plots was 381 birr compared with 68 birr in plots with traditional chickpea. The area planted to improved chickpea was comparatively higher than area planted to traditional chickpea varieties. Examining the production and productivity, we find that on average production and productivity was substantially higher among improved chickpea compared to traditional. The growing of improved chickpeas was associated with more harvest of 501kg compared to traditional varieties.

Using econometric modeling, we use area allocated to improved varieties as an indicator for the extent or scale of adoption. The econometric results show that the effect of adopting improved chickpea on productivity is positive and significant at the 1% level. The growing of improved chickpeas is associated with a 28.5% increase in chickpea productivity. These results are in line with earlier studies that document the productivity (Takam-Fongang et al. 2018) and welfare enhancing effects of adopting improved crop varieties (Asfaw et al. 2012; Khonje et al. 2015; Jaleta et al. 2018).

DNA finger printing data is also collected as a way to verify that farmers are actually growing what they say they are growing. This data is still being analyzed.

Summary

This study is aimed at assessing the impact of improved chickpea research and development in Ethiopia. The objective is to analyze the impact of chickpea adoption on yield, marketable surplus and income. The study will also analyze the impact of chickpea adoption on household food security as well as women empowerment. The impact assessment will documents return on investment on chickpea research and development in Ethiopia, at the national level. When completed the study results are expected to be reference for both researchers and development agencies about the key features, constraints, intervention areas and opportunities for harnessing the chickpea sub-sector towards agricultural development in the country.

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