

Summary of the Dissertation

Essays on the Effects of Land redistribution, Agricultural Extension, and
Social Learning on Technology Adoption and Agricultural Productivity in
Ethiopia

By: Kefyalew Endale Adane

Dissertation Director: Prof. Tomoya Matsumoto

December, 2015

The issue of poverty reduction has received much attention on the global development agenda. The goal of eradicating poverty has been the top priority among the eight Millennium Development Goals (MDGs) which were signed by 189 country leaders at the 2000 UN millennium summit. Since majority of the poor in developing countries depend on agriculture for their livelihood, most of the governments in these countries have been implementing policies and investments which enhance the productivity of rural households such as the dissemination of agricultural technologies, land reforms, and infrastructural developments. These pro-poor policies and investments brought remarkable reduction in the number of poor in developing countries. According to the 2015 MDG report the extreme poverty, which is measured by the percentage of population who earn less than \$1 a day, decreased from 50 percent (in 1990) to 14 percent (in 2015).

Ethiopia is among the poorest countries and hence poverty reduction has been the priority target of the current government. It is also one of the 189 countries which signed the MDGs at the 2000 UN millennium summit. Since over 85 percent of the population in Ethiopia depends on agriculture for their livelihood, the policies implemented by the federal and regional governments have been centered on the agricultural sector to increase the productivity of the rural households. These include heavy investments in public extension programs, redistribution of land in some parts of Amhara region in 1996/97, the issuance of landholding certificates to smallholders, natural resource conservation, and infrastructural development programs. The policies and investments aim at improving farm investments and crop yield by enhancing farmers' knowledge about productive technologies and agronomic practices, scaling-up best practices, allocating land from the land rich to the landless or land poor households to boost the efficient use of farmland, raising the tenure security perception of farmers, and integrating the rural households with markets (Benin, 2006; MOARD, 2010). Consequently, crop yield has improved and strong economic growth has been recorded especially after 2007. The increases in crop yield and growth rate have been accompanied by a marked reduction in poverty especially in the rural areas (MOFED, 2010; World Bank, 2015).

Even though the reports on the recorded poverty reduction in Ethiopia have been attributing the achievement to the agriculture centered policies and investments, the number of empirical studies on how these policies and investments affected technology adoption and agricultural productivity are limited. There are a few studies about the roles of agricultural extension and land certificate programs on farmers' agricultural technology

adoption and productivity. Empirical evidence on the farm practice and productivity effects of the 1996/97 redistributive land reform and the recently promoted practices such as row planting methods for cereal and legume production are, however, extremely scant. The purpose of this dissertation is to fill in the knowledge gaps on the effects of the 1996/97 land reform and the determinants and impacts of row planting adoption. The findings of this study would suggest effective policies to reduce poverty by providing information on how and to what extent the land reform and the new agricultural technology had impact on farming practices and productivity.

The dissertation has two main parts and consists of seven chapters. The first part discusses about the short-run and long-run consequences of the 1996/97 land reform implemented in Amhara region on farming practices while the second part examines the role of extension services and social learning in the technology dissemination in cereal and legume production. Chapter 1 describes the introduction and Chapter 2 highlights the research gaps on land reforms. It also briefly describes about the implementation of the 1996/97 land redistribution in Amhara region and discusses the conceptual framework which shows the links between land redistribution, tenure security perception, farm practices, and crop yield. Chapters 3 and 4 discuss the outcomes of the regression analyses about the short-run and long-run effects of the land reform on farming practices and agricultural productivity. Chapter 5 briefly reviews the literature on agricultural technology adoption and investigates the roles of agricultural extension, social learning, and the other covariates on the adoption of row planting for cereal and legume production. Then Chapter 6 explores the effects of the row planting adoption on crop yield, value of yield, crop

income, and profit. Finally, Chapter 7 concludes the dissertation with a brief summary of the main findings and concluding remarks.

The data used in this dissertation were obtained from two main sources. For the analyses of the short-run effects of the 1996/97 redistributive land reform in Amhara region, repeated cross-sectional data from the Agricultural Sample Survey (AGSS) of the Central Statistical Authority (CSA) was used. The other main data source is the survey in Ethiopia in 2014 as part of the Research on Poverty, Environment, and Agricultural Technology (RePEAT) project, which was conducted by the research team of the National Graduate Institute for Policy Studies (GRIPS) in collaboration with the Ethiopian Development Research Institute (EDRI). In order to analyze the effect of the 1996/97 land redistribution implemented in Amhara, samples used not only from Amhara region but also from its neighboring region, Oromia, where no land redistribution was done after the government change in 1991. These two regions, Amhara and Oromia, share borders and also similar environment for farming especially in the districts that are close to the boundary which separates the two regions.

The main hypotheses tested in the first part of the dissertation which focuses on examining the effect of the land redistribution are the following:

Hypothesis 1: there was differential impact of the land redistribution program on agricultural productivity between beneficiaries who obtained land and losers who lost a part of their land due to the reform. Because of the large imperfections in rural markets for

inputs such as labor, land, and oxen (own and/or hired for ploughing), there is allocative inefficiency in farm production coupled with the limited farming experience of beneficiaries as most of them were the youth, might have decreased the crop yield (kg/ha) on the allocated land in the short-run. On the other hand, the losers could increase the family labor and other resources per farmland on the land left to them after the confiscation and this might have increased the crop yield (kg/ha) on their remaining land. Hence, the overall effect of the land redistribution on crop yield in the short-run is ambiguous.

Hypothesis 2: in the long-run, the redistributive reform is expected to increase the average intensity and crop yield per farmland because even the poor beneficiaries, who might under use the received land in the short-run, would save over time to acquire the complementary inputs such as oxen to cultivate their farmland efficiently.

Hypothesis 3: The reform was implemented by classifying farmers based on their relationships with the previous political regimes into bureaucrats and non-bureaucrats and land was confiscated from former and allocated to those land poor non-bureaucrat sections. The use of the political relationship with the previous political regimes instead of using objective criteria such as family size might have resulted in a heterogeneous tenure security consequence within Amhara region. In other words, due to their favorable relationship with the current political regime, those who received land are expected to make large investments in long-term soil conservation methods and use organic fertilizers intensively than the non-beneficiaries especially from those who lost land.

The main findings from this analysis are as follows. In the short-run, the land redistribution was associated with a significant reduction of the crop yield in the region. Analysis of data from the 2014 RePEAT survey in Ethiopia suggests that the reform might have resulted in the overstocking of oxen among land losers, whereas the poor beneficiaries of the reform might not have efficiently utilized their land because of capital constraints and the absence of schemes to lessen their constraints. Support schemes like credit access for the poor beneficiaries might help to reduce the misallocation consequences of a redistributive land reform in the short-run. But in the long-run, the reform was associated with an increase in the average intensity especially in the short-term soil conservation practices, inorganic fertilizer use, and adoptions of HYV seeds and row planting practice. Consequently, it was associated with a significant increase in crop yield in the region.

The other important finding in Chapter 4 is the heterogeneous tenure security consequences of the reform within Amhara region. The most robust heterogeneous finding is the significant positive association between being a beneficiary in 1996/97 and the likelihood of carryout stone terraces. Stone terrace is the most common type of long-term soil conservation investment carried out by tenure secure farmers on sloppy parcels. Thus, this finding suggests that way the land redistribution was implemented increased not only the farmland of beneficiaries but also their tenure security compared to the non-beneficiaries. Reforms that improve the tenure security of the non-beneficiaries might help to stimulate long-term soil conservation investments in the region. The land per household in the region is already small but the regional land proclamation still allows redistribution of land if 80 percent of village residents favor land redistribution. Abandoning future land

redistribution may be good especially for those who lost land in 1996/97 because most of them were the officers of the past regimes and might be more tenure insecure due to their political differences from the current political regime.

The hypotheses tested in the second part of the dissertation to examine the role of extension services and social learning in the dissemination of row planting practice and the impact of adoption on crop yield and income are given as follows:

Hypothesis 4: the access to agricultural extension services from the development agents and social learning from neighbor farmers are expected to increase the farmers' row planting adoption

Hypothesis 5: row planting adoption is expected to increase crop yield and the value of crop yield. But this practice increases the cost of production by increasing the man hours per unit of land and hence its effects on crop income and profit are ambiguous.

The results show that both training and social learning from neighbors have significant positive effects on row planting adoption. The results from the analysis of row planting impact, on the other hand, show significant positive relationships with the value of crop yield and crop income for teff and wheat production. But it has no significant relationship with the outcome variables for maize production. Since maize has a large seed size than the other main cereal crops, the farmers may be relatively efficient in sowing maize by the broadcast method. The analysis further show that row planting adoption is profitable only for wheat production among the cereal crops. However, family labor was evaluated at the

village level market wage rate which is mostly observed during the peak harvest season due to the seasonality of labor demand and hence it might be too large compared to the shadow wage rate. Due to the difficulty of measuring profit, the results in the regression for crop income are used for policy suggestion because this measure at least takes the cost of purchased inputs into consideration. The findings suggest that row planting practice should be promoted especially for the production of the small seed crops where the broadcast sowing method is very inefficient.