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農業・資源経済学専攻　専攻
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論文題目　Land Reform in Nepal: Equity, Efficiency and Economy
（ネパールに於ける農地改革 −公平性・効率性・経済へ及ぼす効果の数量経済分析−）

　　　　Land reform is a hot and live issue in Nepal. About one third of the population is landless or near landless with very low standard of living. The political parties agree that they should address the land reform issue in a scientific way. Even land laws are there but the proper implementation is always lacking. In this aspect, this study evaluates if land reform laws were implemented properly what would happen in mainly three aspects in Nepal- the impacts on equity, efficiency and the whole economy.

　　　　In this research, we use micro as well as macro perspectives and link them together. From micro perspectives, we use latest Nepal living standard survey 2010/11 data, welfare function for redistributive reform; Cobb-Douglas production frontier function and data envelopment analysis for productivity augmenting reform. Moreover, as the part of this research work, we estimate input-output (IO) table and social accounting matrix (SAM) of Nepal for 2010/11. Since there is no authentic IO table and SAM for Nepal published by government agency, estimation of fresh IO table and SAM has great importance for Nepal. Then using the results of micro studies of chapter three and chapter four, we study the economy-wide impacts of land reform using IO and SAM framework. Furthermore, in chapter five and in appendix 5A, we analyze the micro-simulation impacts of land reform on macro-economy of Nepal using both SAM (in chapter five)

and IO (appendix 5A) framework. So far as in our knowledge, this type of study is novel in literature as well as in case of Nepal and has great significance.

The main motivation of this research is to evaluate the impact of implementation of current land reform policies in Nepal using micro-simulation macro-effect approach. To address this motivation we set three research questions in chapter one as- Does land reform increase household equity and welfare in Nepal? How land reform implementation can reduce inefficiency in Nepalese agriculture? What is the impact of land reform in Nepalese macro economy? We tried to explore the answer of these three research questions in three core chapters of this study. Chapter three explores the answer to the first research question, chapter four explores the answer to the second research question and chapter five and appendix 5A explore the answer to third research question. Additionally, chapter one and two give background, theories, experiences and literatures on land reform to support the core chapters.

To answer the first research question, we used micro level latest household survey data from Nepal, also used income and consumption as welfare measures and estimated these functions in chapter three by using household welfare function equation and taking household own land size as main policy variable. Furthermore, using the estimated welfare function equations of both types (income and consumption), we simulated the current land ceiling policy of Government of Nepal and found the impact of redistributive land reform on per capita household income and consumption. Similarly, we also estimated poverty and inequality indices.

The findings of this analysis suggest that implementation of current ceiling policy will increase average per capita household income by 3.85% and average per capita household consumption by 3.13%. Moreover, there will be substantial increase in per capita household income and consumption in landless and marginal households but only slight decrease in per capita household and consumption in large households while small and medium households are unaffected by these ceiling policies. Similarly, the overall poverty and inequality will be reduced slightly (about 3 percentage point) while rural poverty will be decreased substantially but no change in urban poverty. Hence, this analysis successfully answers the first research question that implementation of land reform policy will increase equity and welfare in Nepal.

To answer the second research question using the same household survey we used Cobb-Douglas stochastic production function (SPF), data envelopment analysis (DEA) and inefficiency effects model in chapter four to estimate the technical efficiency scores and sources of inefficiency in Nepalese agriculture.

The findings of this analysis suggest that Nepalese farms are operating less than frontier and inefficiency sources are common. The gap between frontier and actual production is 30 percent based on SPF and 32 percent based on DEA showing mean technical efficiency scores vary widely between household land sizes and regions. Estimated results show an overall mean technical efficiency score of 0.70 by SPF methods and 0.68 by DEA methods. Based on these results, sample households could increase about 30 to 32 percent of their output through better use of available resources. Additionally, estimated results reveal that the unused land and very large or very small size of household land is an important source of technical inefficiency.

Lack of implementation of reforms, keeps the most productive land unused, underused or less productive otherwise it would be. In addition, absentee landlordism, fragmentation of productive land in many parcels, lack of farmers' education and experience, lack of extension services, lack of use of modern equipment and technology, are the barriers that are the issues of productivity augmenting reform. Similarly, making small-medium sized productive farms by means of redistribution of beyond ceiling land and the consolidation of fragmented lands

enhances efficiency in Nepalese agriculture. If inefficiency effects were eliminated, we can increase the output keeping the same level of inputs. This can be done only by properly implementing productivity enhancing land reform. Hence, this analysis also successfully answers the second research question that implementation of land reform policy can reduce inefficiency in Nepalese agriculture.

To answer the third research question, we estimated IO table and SAM of Nepal for 2010/11. Then using the results of micro studies from chapter three and chapter four, we studied the economy-wide impacts of land reform using IO and SAM framework. In chapter five we performed three simulations. The first simulation is the impact of redistributive reform in Nepalese economy (using results from chapter three), the second simulation is the impact of production augmenting reform (using result from chapter four) and the third simulation is the impact of both reforms simultaneously.

The findings of chapter five suggest that land reform has positive economy wide impacts. Redistributive land reform increases income level of rural landless and marginal households and reduces inequality. Moreover, there will be substantial increase in income of rural landless and marginal households and slight decrease in income of rural large households in all regions as the same percentage in chapter three because we used consumption results from chapter three taking these households as exogenous. However, different than chapter three, the income of small and medium households will also increase in this analysis increasing the total production and income in the economy. This is because, in SAM framework, the change in policy in micro level has an economy-wide macro effect which is the main theme of micro-simulation macro-effects approach. Similar to chapter three, this implementation of redistributive reform will increase equity in the whole economy. Additionally, the IO analysis presented in appendix 5A has also similar but little less impacts because SAM framework also captures the circular flow of income in an economy which IO framework does not.

However, productivity augmenting reform has more impacts on Nepalese economy. In this setting, 10% increase in agricultural crop production will increases the production of all sectors of economy including income of all households as the result of multiplier effect in the economy. In the same time, it will keep the inequality level unchanged because this will affect the income of all households in the similar manner. Similar to chapter four, productivity augmenting reform has economy-wide efficiency effects (IO analysis has similar but less impacts in this case too).

Furthermore, implementing both types of reforms (redistributive and productivity augmenting) simultaneously produce huge impact on Nepalese economy by gaining both equity and efficiency together. Therefore, both types of reforms are important in Nepalese case. The former increase equity while the later increases efficiency. Both reform measures using together will not only increases welfare of households and productivity of economy but also increases the possibility of investment in rural infrastructure, commercialization of agriculture and shifting the surplus labor force in the modern sector by opening the doors for transformation of Nepalese economy. Hence, this analysis also successfully answers the third research question that implementation of land reform policy has substantial positive impacts in Nepalese macro economy.

In order to implement the redistributive land reform, proper identification of rural landless people before redistribution starts is the most. Who are the exact possible beneficiaries of the redistributive reform policy? To know the identity of real landless, the local level communities in their origin can help them to identify properly. Therefore, we recommend that before starting the

implementation process, the concerned authorities need to make good records and database of beyond ceiling household own lands and the beneficiary landless using information from nationwide consolidated data bases. These will help in the screening of beyond ceiling lands, false landless, landless recommended by some political parties with their political interest and so on and prevent from adverse selection due to information asymmetry.

We recommend that land reform should be one shot policy action all over the country and successful implementation is crucial. Furthermore, both redistributive and production augmenting land reform be implemented together. To control fragmentation of land, transfer of land from father to sons or daughters in inheritance basis should not be free of taxes but with substantial tax to the government. This will help to control the fragmentation of land and make the new generation less dependent on their parents bequeath without their any effort. This will also raise the revenue of the government.

Together with land reform policies and action plan, the country should also implement land use policy, which is already prepared but not implemented yet. Land consolidation, provision of transfer of land in inheritance basis, separation of agricultural land and residential land etc. are the main features of land use policy, which are also supportive to land reform policies.

In the course of doing this research, we identified some issues for extension of this research work. Due to the unavailability of household level panel data, we used the cross section data of Nepal living standard survey 2010/11 in this research. In Nepal, three panel studies were already done in household level in 1995/96, 2003/04 and 2010/11. If these data were available, it would be better to use panel analysis for chapter three, four and five. Moreover, an agricultural household acts as both producer and consumer of agricultural products. Using household level data, we can study the consumption and production behaviors of Nepalese households. Therefore, the estimation of household demand function and household production function for each category of household may be a topic for further research.

Furthermore, in this research, we used two general equilibrium models- SAM model in chapter five and IO model in appendix 5A. SAM based general equilibrium model gives more precise impact assessment of policy alternatives in an economy than input-output model. However, in SAM model price is assumed constant and exogenous. This type of fixed price model does not capture the substitution effects. In addition, in SAM model, some sectors must be kept exogenous. This has disadvantage of over calculation of change in income, output and other variables. In contrary, computable general equilibrium (CGE) model assumes price as endogenous and captures the substitution effects. Moreover, in CGE model, all sectors are assumed endogenous; labor market is cleared and may give micro-economy consistent effects of policy.

We used the results from chapter four and five in SAM model and this may be good at this point. Using CGE, the consistency of this research may be violated at this situation because SAM and CGE models may give different results due to different assumptions used. However, to overcome the bottlenecks that arise in SAM framework, we suggest using computable general equilibrium (CGE) modeling framework to study the impact of alternative policy scenarios of land reform in Nepal, which is also the topic for our further research.

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