An Evaluation of Land Reform in Nepal
- Simulation Based Approach -

Damaru Ballabha PAUDEL
Katsuhiro SAITO
(Department of Agricultural and Resource Economics, The University of Tokyo)

1. Introduction

Land reform in Nepal has been one of the hot issues in political and economic sphere for more than five decades. The main cause of political and social conflict is deeply rooted in the unequal distribution of land. The dispute between landlords and tenants remains unsolved for many years; which hinders not only the modernization of agricultural sector but also the economic development of Nepal. Due to lack of strong implementation of reform, the economic problems of the country remain the same especially in agricultural sector. According to CBS [6], Nepal is one of the least developed countries with 26.6 million people among which 85.8 percent of them live in the rural areas. Agriculture is the mainstay of the economy accounting for one third of GDP. The economic growth rate has been around 3 percent on average for a decade with absolute poverty level of 31 percent. The Gini coefficient of land distribution is 0.50; 45 percent of small farmers are operating only 13 percent of total land, while 31 percent of the land is being operated by 8 percent of large farmers. The average size of agricultural land is 0.8 hectares in 2003/04 (CBS [8]) which was 1.7 hectares in 1964. The increased population had much pressure on agricultural land resulting decreased size over time. Since land reform is a vital component of overall agricultural development, the country needs to focus this issue first.

The land reform process of Nepal was initiated in 1951 after the abolishment of 104 years long Rana regime(1). The comprehensive land legislation of 1964 (GON [12]) was good base for land reform under the King Mahendra's rule. Though, it was good in paper, land reform could not take place due to lack of implementation. Many other attempts were made, but the progress was almost nothing indicating failed reforms. The 1964 Act has been amended time to time. The Fifth Amendment to the 1964 Land Related Act was done in 2002 (FALRA 2002) that drastically reduced land ceiling in Nepal. This legislation provides the land reform policy for the country. The major land reform policies are promoting security of tenants and transferring ownership by means of redistribution of land. In this paper, we focus the redistributive land reform policy.

Even FALRA 2002 was not properly implemented indicating failed reform on land. The scenario of land distribution would be different if the land ceilings of FALRA 2002 were properly implemented. Therefore, the main purpose of this paper is to evaluate land reform policy in Nepal making a simulation of redistribution of land based on provision of FALRA 2002 and see the impact of land reform on household welfare.

Table 1 shows the ceiling of land that could be kept by each household before and after FALRA 2002. The law made provision of redistributive land reform in favor of poor farmers by reducing the land limit drastically but the law could not come on force due to many barriers from opposing forces including less will power of political forces to implement it.

Table 1: Land Ceiling Policy of Government of Nepal per Household (in hectare)

Region	Before Fifth Amendment			After Fifth Amendment		
	Agricultural	Homestead	Total	Agricultural	Homestead	Total
Terai	16.4	2.0	18.4	6.77	0.68	7.45
Kathmandu Valley	2.7	0.4	3.1	1.27	0.25	1.52
All other regions	4.1	0.8	4.9	3.56	0.25	3.81

Source: Authors' calculation based on Land Reform Act 1964 with amendments

Table 2 shows current scenario of size of land ownership based on household categories. This also shows that majorities of households have small and medium farms and still there are households having land beyond proposed ceiling by FALRA 2002.

What is the role of land reform to reduce poverty and inequality in Nepal? This is the main research question, which needs to get reply during the course of this paper. To search for its answer, our objective is to explore the link between poverty (or inequality) and land holding size. Based on simulation of land redistribution policy, we focus on study about how land reform can play a vital role to reduce poverty and inequality in the country. The main hypothesis to be tested here is that the larger the access to land for poor, the larger the income and consumption thereby reducing poverty and inequality in Nepal.

Table 2 Size of Own Land holding

Category	Size of Land	Household		Acreage	
		Number	Share (%)	Hectare	Share (%)
Landless Framers	< 0.1ha	287,100	10.13	13,242	0.50
Marginal Farmers	0.1ha-0.3ha	670,000	23.64	117,721	4.44
Small Farmers	0.3ha-0.5ha	648,000	22.86	259,199	9.77
Medium Farmers	0.5ha-3.0ha	1,131,560	39.93	1,804,870	68.01
Large Farmers	3.0ha-10.0ha	93,700	3.31	404,681	15.25
Extra-large Farmers	> 10.0ha	3,800	0.13	54,206	2.04
Total		**2,834,160**	**100.00**	**2,653,919**	**100.00**

Source: High Level Commission on Scientific Land Reform 2010

The findings of this paper suggest that redistribution of land by means of land reform has important role for increasing per capita income and consumption and thus reducing poverty and inequality in Nepal.

2. Literature Review

Land reform can be the foundation stone for modernization of agriculture sector in developing countries by reducing disputes between landlords and tenants. Land being as one of the main factor of production, land reform issues could draw attention of many scholars and researchers. Among others, some researchers focused on redistribution of land. Besley and Burgess[3], argue that land reform in developing countries are aimed at improving the poor's access to land but their effectiveness has often been hindered by political constrains on implementation. They further mentioned that land reform is associated with poverty reduction. Carter[5], de Janvry et al. [10], Deininger [11] also discussed the improved access to land for poor and found that land reform is positively related to the income of poor by reducing their poverty level. Binswanger et. al. [4] also agreed that redistributive land reform policy is not only important for poverty alleviation but also for socio-economic development. Land reform has wider range of benefits for poor by increasing their welfare.

Turning to Nepalese case, most of the studies regarding to land reform focus on the increase in land productivity, tenancy right, security of tenants and redistribution of land (Adhikari [2], Neupane [13], and Regmi [14]). For example, according to a study conducted by CSRC [9], without land reform, there will be no investment in farming technology, no improvement in agricultural productivity and no evolution from subsistence farming to surplus farming. Land reform leading to improved agricultural productivity will stimulate the economy as a whole by creating employment, producing raw materials for other industries and reducing social unrest. From the viewpoint of poverty reduction, the study of Adhikari and Bjornda [1] is important in Nepalese context. Using Nepal Living Standard Survey II data, they specified generalized additive model (GAM), estimated household income and consumption functions, checked the significance of ownland size coefficient and argued that greater access to land for the poor reduces poverty. They further mentioned that an effective land reform policy could well be the most effective approach to alleviate poverty but their study neither considered the income or consumption inequality nor evaluated the land reform policy in Nepal. To the best of our knowledge, there is no simulation study evaluating the impact of land reform policy on per capita income and per capita consumption inequality using FALRA 2002 policy.

3. Research Methods

3.1 Data

Principal data source is NLSS II (CBS [7]) which is a household survey conducted by the Government of Nepal in 2003/2004(2). The sampling frame of this survey consisted of 36,067 primary sampling units (PSUs) such as wards or sub-wards over 3 ecological zones, 5 development regions, 75 districts, 58 municipalities and 3,914 Village Development Committees. Among these 36,067 PSUs, 334 PSUs were selected which cover information from 21,531 individuals living in 3,912 households of the country. This was done in two stages using probability proportional to size (PPS) sampling method. In this study; 3,680 households out of 3,912 records are taken for analysis and others are dropped due to outliers and incomplete information.

Table 3 : Summary Statistics

Variables	Mean	Std. Dev.	Min.	Max.
Dependent Variables (Y)				
Per capita income (NPR)	13860	21942	2	305536
Per capita consumption (NPR)	14780	15156	468	110750
Policy variable (Z)				
Household own land size(ha)	0.59	1.00	0.0032	15.17
Control variables(X)				
Characteristics of household				
Age of household head (years)	32.37	9.46	14	93
Household head female (yes=1)	0.04	0.19	0	1
Education of head (in years)	5.72	2.08	0	17
Chronic illness of head (yes=1)	0.01	0.09	0	1
Household size	6.80	2.94	1	33
Dependency ratio (%)	87.02	89.62	0	700
Earning age (15-59 years) (yes=1)	0.66	0.47	0	1
Land Holding Category (dummies)				
Marginal/Land less	0.28	0.45	0	1
Medium	0.69	0.46	0	1
Large (beyond limit)	0.03	0.17	0	1
Regions (dummies)				
Terai	0.25	0.42	0	1
Kathmandu Vally	0.04	0.19	0	1
All other regions	0.71	0.45	0	1
Hills	0.55	0.49	0	1
Mountains	0.16	0.36	0	1
Distance to Facilities (hours)				
Distance to Motorable Road	1.47	11.27	0	168
Distance to Primary School	0.02	0.10	0	2
Distance to Health Center	0.05	0.32	0	10
Ethnicity Dummies				
High Caste Hindu	0.35	0.47	0	1
Low Caste Hindu	0.09	0.28	0	1
Hill Tibeto Burmese	0.14	0.35	0	1
Terai Tibeto Burmese	0.27	0.44	0	1
Newar	0.07	0.26	0	1
Others	0.08	0.25	0	1

Note: The number of the observations is 3,680.
Source: Authors' calculation based on NLSS II, 2004 (CBS [7])

3.2 Model

We estimate welfare functions (per capita income and per capita consumption) as specified in equation (1). In this equation, Y is measure of per capita welfare (consumption or income), X is vector of control variables (see Table 3 in detail), Z is the variable of interest which is used as policy variable in simulation (household land holding size here, see Table 3), α is constant term, β is a vector of parameters, γ is coefficient of land holding, and ε is error term.

Moreover, dependent and policy variables are specified in the form of natural log. To know the impact of land holding size and variation of land holding by regions, the policy variable is further interacted with regional dummies and household category dummies. Households are categorized as marginal/land less (in Terai less than 0.15 ha, in Kathmandu valley less than 0.04 ha and in other areas-Hills and Mountains, less than 0.08 ha), medium (in Terai 0.15 ha-7.45 ha, in Kathmandu valley 0.04 ha-1.52 ha and in other regions 0.08 ha-3.81 ha) and the large (beyond limit, in Terai more than 7.45 ha, in Kathmandu valley more than 1.52 ha and in other regions more than 3.81 ha). The regional dummies are-Terai, Kathmandu valley and other regions (Hills and Mountains).

$$Y = \alpha + \beta X + \gamma Z + \varepsilon \quad \cdots\cdots (1)$$

Due to the land reform program of FALRA 2002, the land holding size will change because of imposition of land ceiling. After the ceiling applies, the Government acquires the excess land beyond ceiling and distributes it to marginal/ landless farmers. To know the impact of FALRA 2002, we use estimation results of equation (1) together with the adjusted land size due to the effect of land ceiling policy. For this, we estimate per capita income and consumption functions, predict value of per capita income and consumption, calibrate the per capita income and consumption with adjusted land size after distribution of land beyond ceiling to marginal/land less farmers, and then compare results before and after land reform. Moreover, we also compare inequality measures (Gini coefficients and Theil entropy measures) before and after land reform simulation.

4. Estimation Results

Table 3 shows summary statistics of variables used in the estimation. Average per capita income is less than average per capita consumption but income has more variation. Average land holding size is 0.59 hectares ranging from minimum of 0.0032 hectares to maximum of 15.17 hectares.

4.1 Estimation of Per Capita Income Function

The second and third columns of table 4 show Ordinary Least Square (OLS) estimation of per capita income and t-value respectively. Per capita income is significantly positive with household own land size, age of household head, education of head, earning age (15-59 years) and the interaction term of land holding with Terai and Hills but it is significantly negative with variables household head female, household size, dependency ratio, marginal/land less household, Kathmandu valley, low caste Hindu and hill Tibeto Burmese. Other variables are found insignificant.

The effect of household own land size on per capita income is different based on the regions and the size of the land holding categories. This means that in general, per capita income does not have constant elasticity for all regions and all categories of holding. For Terai and Hills, per capita income is increasing with household own land size in reference to Mountains. This is the variable of our interest as policy variable and the result is as expected. The implication of this is-if poor farmers get access to more land, their income would be increased reducing their poverty level. If the age is earning age, the per capita income increases. Higher the age of household head, more is the per capita income. Increase in household head's education level is associated with more per capita income but if the household head is female, size and the dependency ratio in household is larger, per capita income reduces.

Mountains is used here as reference category for regions. Therefore, those having own land in Terai and Hills region have more per capita income than those in Mountains but less per capita income if they are from Kathmandu valley. Similarly, persons with marginal/land less holdings have less income compared to those with medium land holdings while persons with large land holdings are found insignificant. Additionally, with ethnicity of low caste Hindu and hill Tibeto Burmese, per capita income decreases. In Terai and Hills, lands are more productive than in Mountains and accordingly per capita income is also more. However, lands are productive in Kathmandu valley, the result is not as expected because of the reason that only few samples (4%) are from Kathmandu valley and this may be because people from Kathmandu valley rely more on other sectors than agriculture for their livelihoods. Marginal/land less farmers have less income than medium farmers. Similarly, people with ethnicity of low caste Hindu and hill Tibeto Burmese are the ethnic groups which are historically excluded from mainstream; they are less engaged in official jobs and getting less income.

4.2 Estimation of Per Capita Consumption Function

The last two columns of table 4 show OLS estimation of per capita consumption and its t-value. The estimation results show that per capita consumption is significantly positive with household own land size, age of household head, education of head, Terai, Hills, ethnicity Terai

Tibeto Burmese and Newar. However, it is significantly negative with household size, dependency ratio, marginal land holding, distance to motorable road and Kathmandu Valley. It is insignificant with other variables. Different from per capita income estimation, per capita consumption is not significant with female-headed households and earning age. The interaction dummies with household own land size show that per capita consumption increases with the land holding in Terai and Hills compared to Mountains but decreases with the land holding in Kathmandu valley. Compared to the medium sized land holding, per capita consumption decreases with marginal holding but insignificant with large holdings.

Referring the estimation results, we can explain that the effect of household own land size on per capita consumption is different according to the regions and household categories. In general, per capita consumption has not constant elasticity for all regions and all categories of holding. As household land size is a policy variable of our interest and the result is as expected; the implication of this is-if poor farmers get access to more land, their per capita consumption level would be increased helping to reduce poverty level but it is not alike for all the regions. Higher the age of household head, more is the per capita consumption. Increase in household size and dependency ratio decreases per capita consumption but the education level of household head will increase per capita consumption. The longer the distance to motorable road, per capita consumption decreases. Per capita consumption is higher in Terai and Hills in comparison to Mountains but lower in Kathmandu valley. Since only 4% samples are from Kathmandu valley; the result is not as

Table 4 : Ordinary Least Square Estimates for Welfare

Variable	Dependent variable			
	log of per capita income		log of per capita consumption	
Policy variable	Coefficient	t-value	Coefficient	t-value
log of household own land size	0.416	10.36***	0.329	14.30***
Interaction with regions				
log of household own land size*Terai	0.235	5.09***	0.122	4.64***
log of household own land size*Kathmandu	-0.332	-3.24***	-0.164	-2.79***
log of household own land size*Hills	0.096	2.41**	0.075	3.30***
Interaction with holding categories				
log of household own land size*marginal	-0.512	-8.14***	-0.385	-10.66***
log of household own land size*large	0.034	0.07	0.002	0.71
Characteristics of household				
Age of household head (years)	0.007	2.67***	0.003	2.01*
Household head female (yes=1)	-0.371	-2.99***	-0.031	-0.43
Education of head (in years)	0.203	16.00***	0.031	4.19***
Chronic illness of household head (yes=1)	-0.343	-1.35	-0.134	-0.92
Household size	-0.043	-5.42***	-0.133	-28.88***
Household dependency ratio (in %)	-0.002	-8.83***	-0.001	-7.48***
Earning age (15-59 years) (yes=1)	0.408	7.74***	0.034	1.13
Marginal/Land less	-1.056	-5.41***	-0.721	-6.44***
Large (beyond limit)	0.452	0.55	0.329	0.71
Distance to Facilities (hours)				
Distance to Motorable Road	0.003	1.46	-0.003	-2.94**
Distance to Primary School	-0.125	-0.44	-0.019	-0.15
Distance to Health Center	0.033	0.47	0.021	0.53
Regions (dummies)				
Terai	0.162	1.65	0.357	6.41***
Kathmandu Valley	-1.425	-6.53***	-0.445	-3.42***
Hills	0.018	0.26	0.152	3.01***
Ethnicity (dummies)				
High Caste Hindu	-0.028	-0.29	0.045	0.84
Low Caste Hindu	-0.388	-3.38***	-0.069	-1.05
Hill Tibeto Burmese	-0.405	-3.88***	0.002	0.04
Terai Tibeto Burmese	-0.156	-1.54	0.084	2.43**
Newar	-0.001	-0.01	0.111	2.63**
Constants	8.166	49.52***	9.878	104.49
F(26, 3653)		61.86		87.45
R-Squared		0.306		0.386
Number of observations		3680		3680

Note: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level

Source: Authors' estimation based on NLSS II, 2004 (CBS [7])

expected. Kathmandu valley is the region where capital of the country lies and we expect that the per capita consumption should be higher in Kathmandu than in Mountains regarding to household own land size. However, this may be because people from Kathmandu rely more on other sectors than land holdings for per capita consumption. People with ethnicity of Terai Tibeto Burmese and Newar have more per capita consumption than those with other ethnicity because these ethnic people generate more income from business activities and consume more.

5. Simulation based Evaluation of Land Reform

5.1 Land Reform Increases Welfare and Reduces Poverty

Table 5 shows the simulation results. If the land ceiling policy set by FALRA 2002 were implemented the scenario would be as calibrated in table 5. In this table, results are shown for three regions with three categories of household land holding. Household own land-holding size, per capita income and per capita consumption are calculated and compared before and after land reform. In each region, the land holding of large households is reduced to its permitted ceiling and it is distributed to the marginal/land less households.

Table 5 : Land Own Size, Per Capita Income and Consumption Before and After

Variable	Before Land Reform				After Land Reform			
	mean	st. dev.	min	max	mean	st. dev.	min	max
Land holding size (ha)	0.59	1.01	0.003	15.17	0.59	0.84	0.04	7.45
Terai								
Marginal/Land less	0.07	0.04	0.003	0.14	0.18	0.04	0.11	0.26
Medium	1.05	1.09	0.15	6.6	1.05	1.09	0.15	6.6
Large	9.50	2.65	7.62	11.37	7.45	0.00	7.45	7.45
Kathmandu Valley								
Marginal/Land less	0.03	0.00	0.01	0.038	0.07	0.00	0.05	0.08
Medium	0.29	0.31	0.04	1.37	0.29	0.31	0.04	1.37
Large	2.74	1.03	1.80	4.13	1.52	0.00	1.52	1.52
All other regions								
Marginal/Land less	0.042	0.02	0.003	0.079	0.11	0.02	0.08	0.15
Medium	0.62	0.72	0.08	3.78	0.62	0.73	0.083	3.78
Large	5.50	2.11	3.84	15.17	3.81	0.00	3.81	3.81
Per capita Income (NPR)	8583	14105	561	393391	9201	14002	708	393391
Terai								
Marginal/Land less	2689	2467	561	32424	3361	2416	708	35209
Medium	15858	26230	1256	393391	15858	26230	1256	393391
Large	27526	1967	26351	28916	26877	1270	25858	27897
Kathmandu Valley								
Marginal/Land less	4307	790	2395	5552	4612	528	2425	6478
Medium	6127	1205	5876	9942	6127	1205	5876	9942
Large	8709	585	11079	14368	8599	526	9996	14220
All other regions								
Marginal/Land less	4502	4328	907	44396	4706	4102	1032	45707
Medium	9086	11175	789	124377	9086	11175	789	124377
Large	20226	15828	4074	64175	19694	16942	3966	63368
Per capita Consumption (NPR)	11040	7417	300	73879	11080	7281	300	67078
Terai								
Marginal/Land less	7476	2818	1496	20032	8124	2791	1568	20943
Medium	17875	9837	1637	67078	17875	9837	1637	67078
Large	38697	7290	33541	43851	36827	13477	27297	42357
Kathmandu Valley								
Marginal/Land less	5650	1971	996	11184	6277	1680	1253	12553
Medium	6257	2559	1178	12899	6257	2559	1178	12899
Large	8798	2285	6109	14124	6150	1332	4214	13964
All other regions								
Marginal/Land less	6851	2724	1445	15344	6888	2714	1474	15596
Medium	11125	6254	300	40279	11125	6254	300	40279
Large	24423	11402	3445	73879	20331	8427	1807	49244

Source: Authors' estimation based on NLSS II, 2004 (CBS [7])

The maximum land limit that each household can keep is determined based by region where the household landholding is located which is already shown in table 1. This limit includes the homestead land too. Based on table 1, we calculated the total excess land beyond the limit and then reduced the excess land to the maximum ceiling. Similarly, the unused land of absentee landlord is deducted half and the total land is distributed to the almost landless and marginal farmers. In this process of acquisition of excess and unused land, first the Government needs to decide either to give or

not to give minimum level of compensation to the landowner and transfer the ownership. After deciding how much land is to be distributed to which land less/marginal farmer, the Government needs to pass it by executive body before implementation.

In our sample data set, we found 198.96 hectares of land from 125 households (36 households in Terai, 2 households in Kathmandu valley and 87 households in other regions), which is beyond the land ceiling that FALRA 2002 permits. While making simulation in land size, we distributed this excess land to the landless and marginal farmers who have less than 0.15 hectares of land in Terai, less than 0.04 hectares of land in Kathmandu valley and less than 0.08 hectares of land in other regions (Hills and Mountains). This criteria for the land less and marginal farmers who are eligible to get land is based on the proportion of land ceiling defined by FALRA 2002. Such households are 1128 in our sample (326 households in Terai, 8 households in Kathmandu valley and 794 households in other regions). Land is distributed to each marginal/land less households, which are eligible to acquire land based on the regional proportion in the same manner as referred by FALRA 2002 (GON [12]).

After redistribution of land, the average land holding size does not change because the total land is the same in quantity but the distribution pattern changes. The important issue to be mentioned here is that in each region, the land size of marginal/land less farmers increases and the land size of large farmers decreases while the land size of medium farmers remains constant. This is because farmers with medium land-holding category that have their own land within permitted ceiling are unaffected by the land reform policy.

Table 5 gives the complete comparative picture before and after land reform. Now, after the reform, the minimum land size for all samples becomes 0.04 ha (before it was 0.0032 ha) and maximum of 7.45 ha (before it was 15.17 ha) as it is the maximum limit of land permitted by FALRA 2002 in Terai region. In case of Kathmandu valley and other regions, the land ceiling is 1.52 and 3.81 hectares respectively.

After simulating the land size, we calculate the value of per capita income and consumption based on table 4. As the result of simulated land reform, the welfare level (per capita income and consumption) increases for marginal/land less farmers, somehow decreases for large farmers and remains unchanged for medium farmers as shown in table 5. After land reform, average per capita income will be Nepalese Rupees (NPR) 9,201 (before it was NPR 8,583) while average per capita consumption will be NPR 11,080 (before it was NPR 11,040). This shows that there will be slight increase in per capita income and consumption after reform[3].

This finding is consistent with the findings of other researchers and supports our hypothesis that land reform increases welfare (income and consumption) and reduces poverty and inequality.

5.2 Land Reform Reduces Inequality

In order to check the reduction in inequality quantitatively, Gini coefficients and Theil entropy measures are calculated and shown in table 6. The figures show the reduction in inequality. Gini Coefficient was 0.54, 0.34 and 0.67 for per capita income, per capita consumption and household land holding respectively before land reform. After reform, it is reduced to 0.52, 0.33 and 0.61 respectively. Similarly, Theil Entropy measure also shows the reduction in inequality. Both the inequality measures show that the predicted impact of land reform is not so large in spite of increased equality of land distribution. This finding is consistent with the findings of many other researchers and supports our hypothesis that land reform reduces inequality.

Table 6 : Change in Inequality Due to Land Reform

Inequality Measures	Per Capita Income		Per Capita Consumption		Land Holding	
	Before	After	Before	After	Before	After
Gini Coefficient	0.54	0.52	0.34	0.33	0.67	0.61
Theil Entropy	0.59	0.57	0.19	0.18	0.86	0.68

Source: Authors' estimation based on NLSS II, 2004 (CBS [7])

6. Concluding Remarks

Estimation results suggest the positive influence of own land holding size on per capita income and consumption. This shows the importance of the policy variable (own land size) to increase welfare and reduce poverty and inequality in Nepal. Based on the estimation results, we evaluated an effect of land reform (FALRA 2002) by using simulation method. Results show that land reform proposed by FALRA 2002 can reduce poverty and inequality of income and consumption. However, land reform can help to reduce inequality of land distribution in Nepal; the predicted impact is not so large.

Existing studies regarding to Nepalese Land Reform suggest the positive impact on agricultural productivity and agricultural investment. We do not examine these relations in this study. The quantitative examination of the relation is one of our next research subjects.

Notes:

(1) Rana rulers ruled Nepal for 104 years (1847-1951).

(2) This survey was conducted when Nepal was under Maoist people's war. So-called people's war was started in 1996 and ended up in 2006. The household behavior might have changed in some extent but the report of this survey (CBS [8]) mentions that the effect was insignificant.

(3) We found similar results when we used household income and household consumption as dependent variables to denote household welfare functions.

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