



Policy Research Institute
नीति अनुसन्धान प्रतिष्ठान

PRI Publication Series No. 003

Consistency Analysis: Are Agriculture Policies Consistent with Constitutional Mandates?

Research Paper

By
Dr. Santosh Adhikari

May, 2019

Policy Research Institute
3rd Floor, Federal Secretariat Construction and Management Building
Kathmandu Metropolitan City, Ward No. 5
Sano Gaucharan, Kathmandu 44600, Nepal.
Call: +977-1-4430517/ 4434979
Email: info@pri.gov.np

This study was conducted between BS 2075/10/18 and 2076/1/31. The report was prepared and submitted before the approval of PRI's research and publication formats and quality control procedures.

The views expressed in this report are those of the author and do not necessarily reflect the position of or endorsement by PRI.



Copyright © Policy Research Institute

No part of this publication may be reprinted, reproduced, copied, or stored in a retrieval system, transmitted or utilized by any means - electronic, mechanical, by photocopying, recording, or otherwise - without the written permission of the copyright holders for commercial purposes. Readers are encouraged to quote or reproduce material from this publication with due acknowledgment of the author and PRI for the academic and personal purpose.

Consistency Analysis: Are Agriculture Policies Consistent with Constitutional Mandates?

1. Prominent role of agriculture in Nepalese economy

The constitution of Nepal, in its preamble, envisions an egalitarian society based on the following three broad pillars - *inclusive economic development, equity and democracy-based socialism*. These aspirations cannot be realized without the uplifting of the agricultural sector which still engages two-thirds of the population. This paper assesses the agricultural plans, policies and programs adopted by the government of Nepal to determine whether they are aligned with the constitutional mandate.

The Nepalese economy has undergone substantial structural transformation over recent decades. Production and employment have moved out of traditional agriculture to services and manufacturing. Agriculture's share in production has dwindled to less than a third of GDP. However, labor employment is predominantly agrarian as two-thirds of the population is still dependent fully or partially on farming. With high fragmentation, most peasants till small and medium farms. Further, as the sector has lagged in terms of modernization, a large portion of agricultural production remains subsistence based.

The agriculture sector has been adversely affected in recent years by the rising trend of labor migration to foreign countries. The dearth of agricultural labor in rural areas has created upward pressures on wages and production costs. On the other hand, the remittance income received from migrating family members has provided some families the luxury of giving up farming leading to pervasive fallowing over the country, especially in the hills. As agricultural production has not been able to keep up with food demand, the country has turned to be a net food importer in recent years.

A good majority of Nepalese households are food insecure while about a tenth of them are classified as severely insecure. On average, the food security situation of rural households, who are mostly dependent on agriculture, is even worse. The constitution's vision of inclusive growth, democracy-based socialism and an equitable society cannot be achieved without the well-being and social development of agriculture, which holds a large section of population. Also, the rights related to food security and food sovereignty as envisioned in article 36 of constitution cannot

be realized without increased agricultural production. All these point to an urgency for raising agricultural production, particularly among small and medium farmers.

While agricultural policies should aim at raising aggregate agricultural production, we should make sure that the benefits are also shared with the landless agricultural worker and small as well as medium farmers, which make a substantial portion of the farm families. Hence, the government policies relating to agriculture are instrumental for achievement of our twin goals of prosperity and happiness. This report reviews the present situation of Nepalese agriculture sector and analyzes the suitability of the government's recent policies and programs as well as the adequacy of budget allocation to the development of agriculture sector especially that of small and medium sized farmers. We focus on the farmers with less than one hectare of land since a large majority (80 %) of the farmers fall in that category. Also, this group is the most vulnerable to food insecurity and poverty. Thus, the constitutional mandate of inclusive growth, equity and democracy-based socialism cannot be achieved without their socio-economic uplifting.

The study utilizes secondary data that are available from various sources. Agriculture production data are taken from the Ministry of Government's annual statistics on agriculture as well the National Census on agriculture available from the Central Bureau of Statistics (CBS). The data on land holding and distribution of farmers by size are available from CBS's biennial Statistical Yearbooks. Also, supplemental statistics are calculated using the World Bank's Household Risk and Vulnerability Survey 2016 (HRVS, hereafter).

The rest of the report is organized as follows. The next section presents the present situation of agricultural sector with specific attention to small and medium sized farm holders. Section 3 reviews the provisions in the constitution, while section 4 analyzes the period plans of the government as well as policies and programs. Section 5 delves into any (in)consistencies between the constitution and policies and programs and the final section concludes with some discussion.

2. Present situation of the agriculture sector

2.1 Agriculture GDP and employment

Economic development is accompanied with substantial changes in the composition and structure of the economy. As income grows, resources move out of the traditional less productive agriculture sector to modern manufacturing and service sectors. The Nepalese economy has also undergone massive structural transformation over recent decades. However, the movement of labor out of agriculture has been sluggish and more than two-thirds (69 % in 2017) of the Nepalese population

is still employed in agriculture which only accounted for about one-fourth of the GDP in 2017 (See Table 1 below).

Table 1: Share of agriculture in employment and value added (% of total)

Year	2000	2005	2010	2015	2017
Employment	72.2	76.0	74.8	70.0	69.0
Value added	35.3	32.4	35.0	29.2.8	25.0

Source: Employment shares are taken from World Development Indicators database and the value-added shares are taken from Government of Nepal, Ministry of Finance.

Table 2: Average annual growth rates of GDP and its components in different periods

Period	2001-2010	2011-2015	2016	2017
GDP	3.98	4.30	7.39	5.89
Agriculture GDP	3.64	2.89	5.2	2.82
Non-Agriculture GDP	4.43	5.06	8.5	7.1

Source: Government of Nepal, Ministry of Finance.

The Nepalese economy grew at an annual average rate of 3.98 percent during the decade from 2001-2010. The economy grew at a faster pace after that to reach an annual average of 4.3 percent during 2011-2015. The massive reconstruction work after the devastating earthquakes in 2015 saw relatively faster growth rates in 2016 (7.39 percent) and 5.89 percent in 2017. Most of this growth in GDP came from the non-agricultural sector as agriculture languished due to low growth in its productivity. Although agriculture GDP increased by 5.2 percent during 2016, the growth rate fell to its usual lower level of 2.82 in 2017.

The agriculture sector has failed to adopt modern technology and its productivity has languished and the sector is largely limited to subsistence. Various studies have shown that there is a high degree of inefficiency in Nepalese agriculture. For instance, Adhikari and Trond (2009) estimate technical efficiency of Nepalese agriculture using the 2003 NLSS dataset to find a large degree of inefficiency in Nepalese agriculture. Moreover, they find that the technical efficiency is smaller for farms which are too small (less than a hectare) or too large (greater than 2 hectares). Their estimates imply that the productivity is relatively higher for the farms which are between 1 and 2 hectares. Medium-sized farms were found to be the most efficient in their usage of agricultural inputs. The technical efficiency was also found to vary by ecological regions.

In contrast, Thapa (2007) examines the farm size and productivity relationship using household

level data from Nepalese mid hills to find an inverse relationship between farm size and output per hectare. In their sample, smaller farms used more cash input as well as labour hours per hectare. They suggest that their results were guided by the use of factor inputs rather than diseconomies of scale.

2.2 Crop production and productivity growth

Cereal crops cover an overwhelming large share of the cultivated land. This has, however, seen a declining trend recently. Within a decade between 2005 and 2015, the share covered by cereals declined from 84 percent to 78 percent while that of the cash crops increased by the same margin from 16 to 22 percent (See Table 3).

Table 3: Share of cultivated land area for different crops (% of total)

Crop		2005	2010	2015
Cereal		84	82	78
	Paddy	38	36	32
	Wheat	17	18	18
	Maize	21	21	21
	Millet	7	6	6
	Barley	1	1	1
Cash crop		16	18	22
	Sugarcane	2	1	2
	Oilseeds	5	5	5
	Potato	4	3	5
	Fruit	1	2	3
	Vegetable	5	6	7

Source: Ministry of Agriculture Development

Three of the main staples – paddy, wheat and maize - cover more than seventy percent of the cultivated land in Nepal. The share of cultivated land dedicated to paddy production has seen a decline from 38 percent in 2005 to 32 percent in 2015 (See Table 3). However, the share of the remaining two has remained more or less stable. The story is similar for other cereals like millet and barely as well as cash crops including sugarcane, oilseeds and potato. On the other hand, the shares of fruits and vegetable have risen gradually over that period from 1 to 3 percent and from 5 to 7 percent respectively.

Similarly, majority of the growth in production of vegetables (4.17 %) came from the growth in the area of cultivated land (2.84 %) with the remaining 1.33 percentage points contributed by the

growth in productivity. On the other hand, the production of fruits increased by 4.22 percent per year as the rate of decline in productivity (2.69 %) was more than offset by the growth in area of cultivated land, which increased by an average annual rate of 6.86 percent.

Table 4: Average annual growth rates of production, area and yield of cereal crops

Crop	Period	Average annual growth rate (%)		
		Area	Production	Yield
Paddy	2005/06-2009/10	0.30	0.85	0.55
Paddy	2010/11-2015/16	-2.08	-0.73	1.35
Wheat	2005/06-2009/10	2.35	3.47	1.12
Wheat	2010/11-2015/16	-0.57	-0.10	0.47
Maize	2005/06-2009/10	1.27	4.145	3.18
Maize	2010/11-2015/16	-0.33	0.59	0.92
Millet	2005/06-2009/10	0.74	0.90	0.16
Millet	2010/11-2015/16	-0.22	-0.02	0.20
Barely	2005/06-2009/10	1.09	1.71	0.62
Barley	2010/11-2015/16	-0.07	1.64	1.71
<i>Source: Ministry of Agriculture Development</i>				

Table 5 summarizes the trends in the production of different cash crops in recent periods. Cash crops have generally seen an upward trend in production during recent period. For instance, production of sugarcane increased at an annual average rate of 9.84 percent between 2010 and 2015. This was helped by increased cultivation as well as yields, both of which increased respectively at 5.14 and 4.7 percent per year during that period. Similarly, production of potato increased by 7.59 percent per year. This growth was mainly contributed by increased cultivation which rose at an annual average rate of 6.86 percent. The yields, however, increased by only 0.73 percent per year during the same period. In contrast, growth in production of oilseeds (3.4 % per year) was mainly achieved by the growth in productivity (3.01 %), as there was marginal growth in cultivated land area (0.39%).

Similarly, majority of the growth in production of vegetable (4.17 %) came from the growth in area of cultivated land (2.84 %) with the remaining 1.33 % contributed by the growth in productivity. On the other hand, although the production of fruits increased by 4.22 percent per year, as the rate of decrease in productivity (-2.69 %) was more than offset by growth in area of cultivated land, which increased at an average annual rate of 6.86 percent.

As shown in Table 6, the production of milk, both of cow and buffalo, increase by an annual average growth rate of 3.61 percent between 2007/08 and 2016/17. During the same period the growth rate of meat was just shy of 4 percent. The number of eggs increased faster by about 8.83 % per year during that period. Also, there was an even more rapid growth in the production of honey (16.49 %). During that period, the total production of pond fish increased by at an annual average rate of 9.69 percent. About 62 percent of this growth was obtained by the growth in the pond area, which increased at 6.02 % per year, with the remaining 3.46 % coming from the increase in productivity during that period.

Production of agriculture has failed to keep up with rising food demand accompanied with increased population and income. As shown in Table 7, Nepal imported cereals worth 45.41 trillion Rupees in the fiscal year 2017/18 while exporting a meagre amount worth 16.52 million only giving a cereal trade deficit of 45.5 trillion. Not only in cereals, Nepal ran net trade deficits in other food products including vegetables, fruits and oil seeds as well. Overall, Nepal's trade deficit stood at a staggering 1163.51 trillion rupees as imports were more than 15 times than exports.

2.3 Use of improved seeds and chemical fertilizer

As shown in Table 8, use of improved seeds for paddy and wheat has increased over the years with the proportional growth being larger for paddy compared to wheat. Use of improved seeds of paddy increased by 31.1 percent on average annually during the 2009-2014 period. In the Case of wheat, the growth was more modest at a rate of 10.4 percent per annum. Application of improved seeds might explain at least some part of the productivity growth as summarized in Table 4.

Table 5: Average annual growth rates of production, area and yield of cash crops

Crop	Period	Average annual growth rate (%)		
		Area	Production	Yield
Sugarcane	2005/06-2009/10	-0.10	2.00	2.1
Sugarcane	2010/11-2015/16	5.14	9.84	4.7
Oilseeds	2005/06-2009/10	2.59	4.81	2.22
Oilseeds	2010/11-2015/16	0.39	3.40	3.01
Potato	2005/06-2009/10	-0.99	-1.37	-0.38
Potato	2010/11-2015/16	6.86	7.59	0.73
Jute	2005/06-2009/10	-2.49	-3.35	-0.86
Jute	2010/11-2015/16	-5.37	-4.20	1.17

Cotton	2005/06-2009/10	18.00	18.82	0.82
Cotton	2010/11-2015/16	-1.53	-0.91	0.62
Fruit	2005/06-2009/10	6.97	8.20	1.23
Fruit	2010/11-2015/16	6.91	4.22	-2.69
Vegetable	2005/06-2009/10	5.16	7.90	2.74
Vegetable	2010/11-2015/16	2.84	4.17	1.33

Source: Ministry of Agriculture Development

Table 6: Annual growth rates of livestock products and other animal products (2007/08-2016/17)

Product	Milk	Meat	Eggs	Honey	Fish
Growth rate (%)	3.61	3.99	8.83	16.49	9.69

Source: Ministry of Agriculture Development

Table 9 below summarizes the import and consumption of chemical fertilizers in Nepal for recent years. The supply of improved seeds and chemical fertilizer as suggested by household surveys is short of the demand. For instance, according to the HRVS dataset, only 63.4 percent of farms used chemical fertilizer during cultivation in wet season. The share is similar for the dry season as well, with 61 percent. The use of improved seeds is very uncommon. The share of farms that used improved seeds stood only 17.7 percent during the wet season and 26.5 percent during the dry season.

Table 7: Nepal's trade balance of different crops in 2017/18 (All figures are in million Rupees)

Crop	Import	Export	Trade Balance
Cereals	45414.45	16.52	-45397.93
Vegetables	23729.26	1139.87	-22589.39
Fruit	14692.11	0.06	-14636.70
Oil seeds	11343.26	1102.85	-10240.40

Source: Government of Nepal, Ministry of Finance, Department of Customs, Foreign Trade Statistics.

Table 8: Consumption of improved seeds by crop (Metric Ton)

Year	Paddy	Wheat	Maize
2009	959	3555	0
2010	1209	2981	1
2011	1200	2182	0
2012	770	2945	0
2013	2080	5112	NA
2014	3714	5819	NA

Source: Ministry of Agriculture Development.

Table 9: Import and consumption of chemical fertilizer (Metric Ton)

Year	Nitrogen		Phosphorous		Potassium	
	Import	Consumption	Import	Consumption	Import	Consumption
2012/2013	78589	61052	34740	30068	2999	1600
2013/2014	65500	66958	32200	33555	3000	2415
2014/2015	83200	71314	27600	31320	4500	2807
2015/2016	70006	56451	29456	26408	2957	2923
2016/2017	80963	82387	36785	35583	4500	3568

Source: Ministry of Agriculture Development.

2.4 Irrigation and road infrastructure

One of the factors holding Nepalese agriculture realize its growth potential is lack of irrigation. As shown in Table 10, only about 1.3 million hectares (52 percent) of the cultivated land had access to irrigation in 2011, with the share being substantially lower in difficult terrains of the hills and mountainous regions. The situation has not improved much as irrigation has been extended for very little land over recent years (See Table 11). This leaves agriculture vulnerable in the mercy of climatic conditions.

Table 10: Land area under irrigation by ecological region (thousand hectare)

	2001/02				2011/12			
	Nepal	Mountain	Hill	Terai	Nepal	Mountain	Hill	Terai
Total Area	2654	219	1040	1397	2523	214	986	1323
Area irrigated	1168	62	305	801	1314	58	270	985
% of total	44	28	29	57	52	27	27	74

Source: Statistical Pocket Book 2016, Central Bureau of Statistics.

Besides, other infrastructure gaps put the farmers in those regions in a considerable disadvantage in terms of agricultural productivity. For instance, as presented in Table 12, only about 2.2 percent of village network is of black top type and 21.8 percent is graveled. A large majority (76 %) of the village network is earthen and can be accessed only during fair weather. Only 24 percent of the road network can be accessed in all weather conditions leading to serious constraints for transportation of agricultural inputs including fertilizers and seeds as well as sending agricultural products of the farmers to the markets. In the HRVS sample, the average distance to a motorable road was 3 Kilometers. On average, households were 15.4 Kilometers away from an all-weather blacktopped road. There is a large variation in the distance to blacktopped road with the rural areas being on the wrong side of the distribution. Poor road connection constrains farmers in adopting farming techniques that are best suited to them.

2.5 Farmer's access to credit

The Nepalese farmers have also been constrained by their lack of proper credit services. Table 13 below summarizes the access to credit by size of land holding for the census years 2001/02 and 2011/12. Between those two periods, the proportion of farmers with agricultural credit actually decreased from 23.8 to 21.8 percent. The decline is consistent among all the farmers, small as well as large. Moreover, smaller farmers are found to be constrained more by lack credit compared to large farmers as indicated by the numbers in the table.

Table 11: Extension of additional irrigation facilities (Area in thousand hectare)

Fiscal year	Total	Hill	Terai
2010/11	47.80	16.4	31.39
2011/12	17.45	1.3	16.10
2012/13	19.56	0	19.56
2013/14	19.31	0	19.31
2014/15	18.08	0	18.08
2015/16	23.26	0	23.26
2016/17	41.18	0	41.18
<i>Source: Statistical Year Book 2017, Central Bureau of Statistics.</i>			

Table 12: Province-wise Summary of Village Road Network (VRCN)

Province	Length (Km)				Accessibility	
	Total	Black top	Gravel	Earthen	All weather	Fair weather
Province 1	6121.6	142.3	1616.5	4362.8	1758.82	4362.8
Province 2	3175.9	15.3	1176.2	1984.4	1191.5	1984.4
Province 3	9248.6	289.3	1722.8	7236.5	2012.1	7236.5
Gandaki	6831.3	128.5	696.9	6005.9	825.4	6005.9
Province 5	4470.5	97.9	1467.6	2905.0	1565.5	2905.0
Karnali	857.3	9.4	23.1	824.8	32.4	824.8
Sudurpaschim	1198.6	10.8	250.6	937.2	261.4	937.2
Total	31903.9	693.5	6953.7	24256.7	7647.2	24256.7
	100 %	2.2 %	21.8 %	76 %	24 %	76%

Source: Department of Local Infrastructure.

2.6 Food security

On average, rural households are worse off than the urban households in terms of food security. Only 39 percent of the rural households are food secure compared to 54 percent for those who reside in urban areas. Also, among the three ecological zones, the food security situation is the worst in the mountains where only 38 percent of the households are food secure. The respective numbers for Hills and Terai regions are respectively 47 and 51 percent. Almost 14 percent of the households in mountains are severely insecure with regards to food.

Table 13: Access to credit by farm size, Nepal (2001/02 - 2011/12)

Size of holding	2001/02	2011/12
Less than 0.5 hectare	21.7	20.1
0.5 – 2.0 hectare	24.9	23.5
More than 2.0 hectare	31.0	27.9
Total	23.8	21.8

Source: Statistical Pocket Book 2016, Central Bureau of Statistics.

There is a substantial provincial variation in food security. The worst performer is Karnali province, where only 22.5 percent of the households are food secure, followed by Province 7 (38 percent). Only 43.1 percent of the households are food secure in Province 2 despite its abundant plains suitable for agriculture. In Karnali Province, as astonishingly high 17.5 percent are severely food insecure. Also, the food security situation is dire for the poorest section of the population by

wealth. Only 18.1 percent of the households in the poorest wealth quintile are food insecure while the remaining are food insecure with 22.2 percent being severely insecure.

In the HRVS dataset, more than a quarter of the interviewed households were found to be worried that family might not have enough to eat. About 45 percent of the households had family members who had smaller meals than needed because of lack of food. For example, about 6.8 percent of households ate smaller meals for 3 to 10 times a month while about 1.5 percent had to face that misery more than ten times in a month. This suggests a very dire food security situation in Nepal.

2.7 Distribution of households by land-ownership

Table 14: Household food security situation in Nepal

Characteristics	Secure	Mildly insecure	Moderately insecure	Severely insecure
Residence:				
Urban	54.0	17.3	19.9	8.8
Rural	38.8	23.5	26.0	11.7
Ecological Zone:				
Mountain	38.4	18.8	28.9	13.8
Hill	46.8	18.8	24.4	10.0
Terai	51.0	20.7	19.1	9.2
Province:				
Province 1	52.6	20.3	18.0	9.2
Province 2	43.1	26.4	19.8	10.7
Province 3	55.0	16.4	20.0	8.5
Gandaki	56.0	16.9	21.1	6.0
Province 5	48.4	19.2	22.2	10.2
Karnali	22.5	17.8	42.2	17.5
Sudur Paschim	37.7	18.0	31.2	13.0
Wealth quintile:				
First	18.1	20.8	38.9	22.2
Second	36.7	23.5	28.0	11.7
Third	45.5	25.8	21.4	7.3
Fourth	61.2	19.3	14.3	5.2
Fifth	78.5	9.5	8.9	3.1
Nepal	48.2	19.7	22.2	9.9

Source: Nepal Demographic and Health Survey (DHS) 2016.

There is a large inequality in land ownership in Nepal. Table 15 presents the distribution of land according to the National Sample Census of Agriculture 2011/12. As the table shows, 3% of the households or more than 115000 households in Nepal were landless. Moreover, large number of households among the land-owners own very little land. As shown in Table 15, about 9.1 % of the agricultural households owned less than 0.1 hectare of land with another 12.1 percent holding between 0.1 and 0.2 hectares. A majority of agricultural households owned less than half hectares of land while more than 80 percent owned at most one hectare. Only about 5 percent of the agricultural households owned more than two hectares of land.

Overall, the average size of the farm size was 0.66 hectare. However, the average size among the group holding less than 0.1 hectare was just 0.03 hectare. Among the farmers with less than one hectare the average farm size is just 0.25 hectare. This group of farmers account for more than 80 percent of farmers and own only 46.8 percent of total cultivated area.

The distribution of Nepali households according to the HRVS dataset are presented in Table 16 below. In their sample, which is based on the interviews held in 2016, about 37.1 percent of households, own less than 0.2 hectares of land, while more than 90.2 percent of the households own at most one hectare. Both of these datasets imply that most of the farmers are small.

2.8 Land-ownership, education, occupation and poverty

Table 17 below presents the distribution of household and population distribution by occupation and incidence of poverty. In general, the population engaged in agriculture are relatively poorer than those engaged in other sectors. For instance, among self-employed people, poverty head count is 27.23 percent among those involved in agriculture against 22.44 percent in manufacturing and 19.63 percent for in services. It is, however, among the waged workers where the difference stands out. The poverty head count for the waged workers involved in agriculture stands as tall as 47 percent substantially larger than other sectors.

As shown in Table 18, there is a negative association between land ownership and incidence of poverty. Poverty head count rate is substantially larger among landless and those who own less than one hectare of land. For the households with an ownership of more than one hectare, the poverty rate drops off sharply. As discussed earlier, the productivity of Nepalese agriculture varies by farm size and by ecological region as well, with medium farms and those in the Terai being relatively more productive than smaller farms and those in the hills and the mountains.

2.9 Equity in agriculture

The data available from Ministry of Agriculture Development are not available in sufficiently disaggregated level so as to measure equity in agriculture. For instance, as discussed earlier, the data on consumption of chemical fertilizer and improved seeds are available at the aggregate level, but not by size of landholdings. We use raw data from the HRVS database to estimate the spending on improved seeds and chemical fertilizer by farm size.

Table 19 shows the amount spent on improved seeds or young plants and chemical fertilizers by different categories of farmers during a year. The spending increases with the size of landholding. However, controlling for the size of land reveals that the smaller farmers are spending much larger per hectare of land compared to larger farmers. For instance, poor farmers, who own less than 0.2 hectare of land spend 37159 Rupees, more than six times the amount spent by the large farmers who own more than 2 hectares of land.

Moreover, larger farmers were more likely to use improved seeds for plantation compared to smaller farmers. For example, while about 29 percent of large farmers adopt improved seeds in wet season, less than 19 percent of poor farms spend on seeds and young plants. Large farmers naturally spend more on improved seeds as compared to medium and small farmers who spend more than that is spent by poor farmers. However, when we look at spending per hectare, the relationship gets reversed. Poor farmers, on average, spend more than eight times the average spending by large farmers. According to the National Sample Census of Agriculture 2011/12, smaller farmers were less likely to use different agricultural equipment (See Table 21).

Table 15: Number of holdings, area and average land-holding

Land holding (hectare)	Number of holdings	Total cultivated area (hectare)	Share of to- tal holdings (%)	Share of total cultivated area (%)	Cumulative share of total holding (%)	Cumulative share of total cultivated area (%)	Aver- age size (hectare)
Holding without land	115,538	3,119.30	3.0	0.1	3.0	0.1	0.03
Under 0.1	355,549	20,076.50	9.3	0.8	12.3	0.9	0.06
0.1-0.2	461,957	68,161.80	12.1	2.7	24.4	3.6	0.15
0.2-0.5	1,169,503	396,720.90	30.5	15.7	54.9	19.3	0.34
0.5-1	984,022	695,060.10	25.7	27.5	80.6	46.8	0.71
1-2	548,974	749,810.00	14.3	29.7	94.9	76.5	1.37
2-3	129,364	308,568.50	3.4	12.2	98.3	88.7	2.39
3-4	39,507	134,353.10	1.0	5.3	99.3	94	3.40
4-5	14,881	65,364.70	0.4	2.6	99.7	96.6	4.39
5-10	10,744	69,177.10	0.3	2.7	100	99.3	6.44
More than 10	1,054	15,227.20	0.0	0.6	100	99.9	14.45
Total	3,831,093	2,525,639.20	100	100	100	100	0.66

Source: National Sample Census of Agriculture 2011/12

Table 16: Distribution of households by land ownership according to the World Bank's 2016 Household Vulnerability and Risk Survey

Land ownership (hectare)	Share of households	Cumulative share
< 0.2	37.1	37.1
0.2 – 1.0	53.1	90.2
1.0 – 2.0	7.1	97.3
>2.0	2.7	100.0

Source: Household Risk and Vulnerability Survey 2016, Wave 1

Table 17: Distribution of households and population by occupation and incidence of poverty

Occupation	Poverty head count	Poverty gap	Poverty severity	Distribution of poor	population
Self-employed:					
Agriculture	27.23	6.00	2.05	55.2	51.0
Manufacturing	22.44	5.03	1.77	3.8	4.2
Trade	13.21	2.54	0.74	4.1	7.9
Services	19.63	3.33	1.02	2.0	2.6
Waged labor:					
Agriculture	47.03	8.56	2.52	6.3	3.4
Professional	5.55	1.14	0.35	0.7	3.3
Other	28.25	5.76	1.73	16.2	14.5

Source: Central Bureau of Statistics (CBS), Nepal Living Standard Survey 2010-2011.

Table 18: Distribution of households by land ownership and incidence of poverty

Land ownership (Hectare)	Distribution of population (%)	Poverty head count rate (%)	Poverty gap
No land	21.0	22.7	4.7
< 0.2	17.0	29.9	7.0
0.2-1.0	44.0	28.2	6.2
1.0-2.0	13.0	19.1	3.3
>2.0	4.7	6.5	1.2
Nepal	100	25.2	5.4

Source: Central Bureau of Statistics (CBS), Nepal Living Standard Survey 2010-2011.

3. Provisions in the constitution

Article 36 of the constitution of Nepal expresses certain rights related to food. As per sub-article (1), *“every citizen shall have the right relating to food.”* Sub article (2) states that *“every citizen shall have the right to be safe from the state of being in danger of life from the scarcity of food.”* While in sub-article (3), the constitution guarantees *“every citizen shall have the right to food sovereignty in accordance with law.”*

Moreover, under article 51 (e), the constitution urges the state to adopt certain policies relating to agriculture and land reforms. The policy of the state is *“to make scientific land reforms having regard to the interests of the farmers, while ending the dual ownership existing in the lands”*. Also, the state’s policy is *“to enhance product and productivity by carrying out land pooling, while discouraging absentee land ownership”*. Similarly it is the policy of the state *“to make land management and commercialization, industrialization, diversification and modernization of agriculture, by pursuing land-use policies to enhance agriculture product and productivity, while protecting and promoting the rights and interests of the farmers, to make proper use of lands, while regulating and managing lands on the basis of, inter alia, productivity, nature of lands and ecological balance, and to provide for the farmers’ access to agricultural inputs, agro-products at fair price market.*

The constitution clearly guarantees the rights to food and has provisions of food security for all. Moreover, the constitution’s vision of inclusive growth, democracy-based socialism and an equitable society cannot be achieved without the well-being and social development of agriculture sector in general and that of small and medium farmers in particular. The situation of food security and poverty as well as overall level of social development are plausibly associated with land ownership, this research focuses on the farmers with land holding less than one hectare which covers about four-fifth of the total farm households.

Table 19: Spending on improved seeds and chemical fertilizers by farm size during wet and dry season

Farm size	No. of obs.	Share who paid for fertilizer (%)		Spending on fertilizer (Rs.)		Share who paid for seeds and young plants (%)		Spending on seeds and young plants (Rs.)	
		Wet season	Dry season	Total	Per hectare	Wet season	Dry season	Total	Per hectare
Large	160	55.6	45.6	17676	6414	28.8	36.9	8000	3330
Medium	427	60.0	42.9	11424	9040	28.6	31.6	5577	4346
Small	3181	62.0	42.9	5814	14317	26.1	26.2	3720	8755
Poor	2196	41.0	26.8	3763	37159	18.3	16.5	2137	26040
Total	5964	53.9	37.0	6138	18656	23.5	23.3	3652	11947

Source: Author's calculations based on the World Bank's Household Risk and Vulnerability Survey (HRVS) 2016. Farmers are classified into four different groups according to the size of the farm they own as follows: Poor (less than 0.2 hectare); Small (0.2-1 hectare); Medium (1-2 hectares) and Large (greater than 2 hectares)

Table 20: Agriculture budget allocation as a share of total national budget

Fiscal Year	Agriculture Budget (Billion Rs.)	Total National Budget (Billion Rs.)	Agriculture Budget Share (%)	Fiscal Year	Agriculture Budget (Billion Rs.)	Total National Budget (Billion Rs.)	Agriculture Budget Share (%)
2066/67	7.88	285.93	2.76	2071/72	23.28	618.10	3.77
2067/68	10.52	337.90	3.11	2072/73			
2068/69	12.43	384.90	3.23	2073/74	27.44	1048.92	2.62
2069/70	12.30	404.82	3.04	2074/75	24.26	1278.99	1.90
2070/71	21.40	517.24	4.14	2075/76	30.02	1315.15	2.28

Source: Government of Nepal, Ministry of Finance.

Table 21: Share of holdings using different equipment (%)

	Iron ploughs	Power tillers	Shallow tube well	Deep tube well	Rower pump/ Dhiki	Tractor	Thresher	Pumping set/motor	Animal drawn cart	Sprayer	Other equipment
Holding without land	0.03	2.0	0.1	5.4	0.9	0.2	0.4	0.5	0.6	0.3	1.1
Under 0.1 ha	0.06	18.3	2.1	8.2	3.8	0.9	9.4	7.6	5.4	2.0	9.2
0.1-0.2 ha	0.15	24.3	2.8	7.5	3.4	1.5	18.6	17.5	11.1	4.3	11.4
0.2-0.5 ha	0.34	23.9	1.9	7.3	3.4	1.7	20.6	19.4	12.1	5.5	13.2
0.5-1 ha	0.71	29.3	1.6	9.5	4.1	2.2	22.9	22.2	14.9	9.5	15.6
1-2 ha	1.37	40.1	1.9	13.9	5.6	3.3	30.3	29.7	21.7	16.6	21.0
2-3 ha	2.39	52.5	2.9	19.5	8.9	4.7	42.9	40.4	31.2	27.7	29.5
3-4 ha	3.40	56.0	3.5	23.6	9.4	4.7	52.8	48.6	39.7	32.7	36.2
4-5 ha	4.39	60.2	4.9	30.3	13.3	6.9	55.4	54.7	45.9	37.1	42.6
5-10 ha	6.44	58.7	5.5	29.6	14.7	3.8	63.8	55.4	55.4	38.4	47.0
More than 10 ha	14.45	41.1	15.1	10.6	11.2	2.8	63.7	64.4	46.2	37.8	39.8
Total	0.66	28.0	2.0	9.6	4.2	2.1	22.0	21.0	14.3	8.7	15.0
<i>Source: National Sample Census of Agriculture 2011/12</i>											

4. Government plans, policies and programs

After the completion of the Agriculture Perspective Plan (APP) in 2015, the government of Nepal has prepared the Agriculture Development Strategy (ADS) that is expected to guide agricultural policies for the next twenty years. It provides the conceptual framework of agricultural transformation of Nepal from a society primarily based on agriculture to one that derives most of its income from services and industry. The priority under ADS lies on self-sufficiency in food grains; sustainability; competitiveness, inclusiveness, livelihood and food and nutrition security. There are four different prioritized national programs also known as “ADS Flagship Programs”. They are: (a) Food and Nutrition Security Program; (b) Decentralized Science, Technology, and Education Program; (c) Value Chain Development Program; and (d) Innovation and Agro-entrepreneurship Program.

The Fifteenth Plan as well as recent annual policies and programs of the government have all stressed the mechanization and modernization of the agricultural sector to move away from subsistence to sustainable enterprises. With an aim of achieving growth in agricultural productivity and production, the government of Nepal announced the need of subsidies for inputs including fertilizer, improved seeds, insecticides and pesticides as well as enhancing access to irrigation. The government has pledged that it will facilitate every activity from plantation to final production and packaging. Also, the government would help enhance market infrastructure, road access and network as well as facilitate exports. The Fourteenth plan, for instance, had envisioned subsidy for the construction of storage houses, agriculture products collection centers and other farmers and retail markets including reconstruction of Kalimati vegetables and fruits retail market and construction of fruits and flowers retail center in Chobhar. The Fourteenth as well as the Fifteenth plan also contain a “one village one product” program based on comparative advantage and climate suitability. The Fifteenth plan aims to raise the entrepreneurship and productivity of small and medium farms with the provision of credit facilities and social security programs for farm holders.

The annual policies and programs for the fiscal year 2073/74 announced increased investment in agriculture to achieve self-sufficiency in major crops and food security within two years. There is reiteration of the guaranteed access of seeds, fertilizers, irrigation and markets for agricultural products as well as access to agriculture credit and insurance to make it available for all farmers. Also, the policies aimed at establishment of a social security fund in participation of the farmers. The policies and programs for 2074/75 has spoken of improvement in access to irrigation,

fertilizers and seeds and continuity of programs that enhance production of livestock as well as providing livestock and crop insurance for farmers. The government had aimed to develop agriculture as a major contributor in national production and achieve self-sufficiency in major agricultural crops. The policy has also stressed for effective implementation of programs targeted at economically and socially backward farmers, but the government has failed to come up with the suitable programs in that direction.

The policies and program 2075/76 make ambitious statement of doubling agricultural production within five years. The Prime Minister Agriculture Modernization Project would be expanded and expeditiously implemented to achieve modernization and commercialization of agriculture. The government would adopt necessary policies to achieve self-sufficiency in major agriculture-products, livestock, poultry and fisheries and to increase exports of high value agriculture-products. Besides the usual statements on the subsidy for inputs and access to facilities, the program also insists on the price support for paddy, wheat and sugarcane. Also, the policies urge the government to revise land use policy and laws to enhance productivity of land.

The National Agriculture Policy, 2061 has first proposed the identification of poor farmers and provisions to subsidize them with necessary facilities to increase productivity and enhance food security. Similarly, in the budget speech of FY 2071/72, the government publicized the plans for the classification of farmers and provide subsidies for farmers according to their farm size. The Agriculture Development Strategy, 2072 has also included this provision in its framework. The annual policies and programs of FY 2073/74 has also expanded this notion with the vision for development of a social security fund in participation of the farmers to bring them within the reach of social security. To that end, the government of Nepal came up with the Farmers Classification and Security Scheme 2073 (FCCS, hereafter) which provides the guides for classification of farmers by ownership of land as summarized in Table 22.

The FCCS has classified the farmers in six different groups ranging from landless farm workers who own less than 0.1 hectare of land to very large farmers holding more than ten hectares. As shown in the table and as mentioned earlier, a large majority of the farmers hold very little land, with only three percent owning more than three hectares. The government subsidies for different agriculture inputs, machinery and equipment for different categories of farmers as proposed by the FCCS are summarized in Table 23. The proposed scheme is progressive in nature with the subsidies and support being the largest for agricultural workers and poor farmers and decreasing with landholding. Under the scheme, agricultural workers and farmers with less than 0.3 hectare of

land are entitled with a subsidy of 75 percent in most of the purchases including fertilizers, seeds, as well as agricultural machinery and instrument. Similar supports are provided in irrigation, electricity and agricultural energy as well as in interests and insurance premiums. Moreover, the scheme mandates the government contribute 150 percent of the amount these farmers save in the pension fund. The degree of support goes smaller for farmers with larger land ownership with the support being the least for large farmers who own more than 3 hectares of land. As a large majority of the farmers are at most a medium farmer under this classification, most of the farmers would benefit from this scheme. More importantly, the scheme would help enhance equity in agriculture with its progressive footing.

The budget for the fiscal year 2018/19 announces programs for modernization, commercialization, mechanization and the expansion of value chain in agriculture to build agriculturally strong economy by doubling agriculture production within five years. Doubling agriculture GDP in five years demands an annual growth rate of 14 percent to be sustained for five years. It's a big ask as the current growth rate stands at 2.82 percent, at which rate it takes 25 years for agriculture GDP to double. The government announced that specified grants would be provided to those industries that rely on agricultural raw materials and the production of high value agricultural goods will be prioritized. Although there are provisions for improved supply of fertilizers, pesticides, insecticides and others, the government lacked to expand the access of poor and small farmers to those inputs and facilities. Also, there was provision of expansion of agriculture insurance to address production risk. The budget included loan waivers for small farmers and institutional reforms for the expansion of loans for small farmers. The budget announced that it would fix support price before planting the specified agricultural crops, including wheat, rice and sugarcane. Moreover, the government allocated the budget for the distribution of the National Social Security Certificate to poor households of 26 districts within the next fiscal year and expansion of the same program to the remaining 51 districts within the next two years.

5. Discussion and conclusion

The constitution of Nepal guarantees every citizen the right to be safe from the state of being in danger of life from scarcity of food. Also, the constitution envisions a broad roadmap of inclusive growth, equitable society and democracy-based socialism. The Fourteenth Plan as well as annual policies and programs of the government have all prioritized the need for increasing aggregate agricultural production. For instance, they seem to identify mechanization and modernization of the agricultural sector to move away from subsistence to sustainable enterprises. The annual

policies and programs have announced increased investment in agriculture to achieve self-sufficiency in major crops and food security. Also, the policies and programs have identified the need for guaranteed access of seeds, fertilizers, irrigation and markets for agricultural products as well as access to agriculture credit and insurance to make it available for all farmers.

However, the annual policies and programs seem to have failed to address the equity concerns. Growth of the agricultural sector does not necessarily guarantee that it includes all the farmers, especially the small and medium ones, in the growth process. The annual policies and programs of the government are mostly focused on increased agricultural production and thus cannot guarantee equity. About 80 % of the farm households own less than one hectare of land and generally lack financial muscle needed for modernization of farming. However, the government has failed to introduce policies and programs that help them in that direction. While, agricultural policies should aim at raising agricultural production which mainly comes from larger farmers, we should make sure that the landless agricultural worker and small farmers are not forgotten.

As summarized in Table 20, budget allocation to agriculture as a share of total government spending has increased over recent years, especially after the promulgation of the constitution. In the current fiscal year (2075/76), only 2.28 percent of the total budget went to the Ministry of Agriculture Development. Although, there is in general a gradual increase in spending on agriculture, there was a change in the opposite direction in the fiscal year 2074/75. This is inadequate for the development of the sector which still engages two-thirds of the national population. Also, there is insufficient budget targeted to small and medium sized farmers.

With two-thirds of the population still being partially or completely employed in the sector, agriculture remains key for economic growth and equity. However, as productivity is low, the sector accounts for less than one-third of the GDP. As agricultural production has not been able to keep up with the growth of food demand, the country has turned to be a net food importer in recent years. This has deteriorated the food security situation in the country challenging the constitution's provision of food security. A good majority are food insecure at different degree. Almost one in ten households are severely food insecure. Moreover, there is a large regional and ecological variation in food security situation.

Thus, there are pressing needs for improvement in productivity as well as growth of the agriculture production. As discussed earlier, among the factors holding back Nepalese agriculture are lack of infrastructure including road connectivity and irrigation facilities as well as that of improved seeds and fertilizers. Moreover, credit access seems to have constrained the farmers in their

adaptation of new production technologies. The government should allocate resources wisely in order to fix these gaps in order to increase overall agriculture production. The annual policies of the government have identified the need for modernization and mechanization of agriculture in order to increase production. However, budget allocation to agriculture as a share of total government spending has decreased over recent years, especially after the promulgation of the constitution. This is severely inadequate for the development of the sector, which still engages two-thirds of the national population and thus needs to be increased.

However, growth in itself is not sufficient for equity. A large majority (80 %) of farmers hold less than one hectare of land. While, agricultural policies should aim at raising aggregate agricultural production, we should make sure that the benefits are also shared with the landless agricultural worker and small as well as medium farmers which make a substantial portion of the farm families. For the achievement of an equitable society as envisioned in the constitution, the growth process needs to include this large section of small and medium farmers. The government has, however, failed to come up with sufficient programs targeted at small and medium farmers. This situation needs to be reversed if we are to march towards an equitable society with democracy-based socialism. The smaller farmers need to be subsidized in order to raise their productivity and modernize agriculture. Programs targeted to poor and small farmers, as discussed earlier, would be highly inclusive as it would cover more than eighty percent of the farm population.

The incidence of poverty, in general, is higher among those involved in agriculture compared to other sectors. Within agriculture, the poverty head count is substantially larger among the landless agricultural workers and those who own very little land. As the size of landholding increases, the incidence of poverty declines. The constitution's vision of democracy-based socialism and an equitable society cannot be achieved without the well-being and social development of the small and medium farmers. Thus, policies should be oriented towards that direction with special provisions for that group of farmers. Equitable and inclusive growth of agriculture sector is a prerequisite for the constitution's goal of inclusive and equitable society and democracy-based socialism.

Bibliography

- Adhikari, C. B., & Trond, B. (2009). Measuring the Extent of Technical Inefficiency in Nepalese Agriculture Using SDF and DEA Models. *INSTITUTE FOR RESEARCH IN ECONOMICS AND BUSINESS ADMINISTRATION Working Paper*.
- Agriculture Development Strategy. (2017). Kathmandu: Government of Nepal, Ministry of Agriculture Development.
- Agriculture Perspective Plan. (1997). Kathmandu: Government of Nepal, Ministry of Agriculture Development.
- Annual Policies and Programs. (2016). Kathmandu: Government of Nepal.
- Annual Policies and Programs. (2017). Kathmandu: Government of Nepal.
- Annual Policies and Programs. (2018). Kathmandu: Government of Nepal.
- Constitution of Nepal. (2015). Kathmandu: Government of Nepal.
- Demographic and Health Survey. (2016). Kathmandu: Government of Nepal, Ministry of Health.
- Farmer Classification and Security Scheme. (2017). Kathmandu: Government of Nepal, Ministry of Agriculture Development.
- Gauchan, D., & Shrestha, S. (2017). Agricultural and Rural Mechanisation in Nepal: Status, Issues and Options for Future. In M. S. M.A., S. Biggs , & S. Justice, *Rural Mechanisation. A Driver in Agricultural Change and Rural Development. Institute for Inclusive Finance and Development*. Dhaka.
- Household Risk and Vulnerability Survey, Wave I*. (2016). Retrieved from The World Bank: <http://microdata.worldbank.org/index.php/catalog/2905/study-description>
- National Agricultural Policy. (2004). Kathmandu: Government of Nepal, Ministry of Agriculture Development.
- National Sample Census of Agriculture. (2013). Kathmandu: Government of Nepal, Central Bureau of Statistics.
- Nepal Demographic and Health Survey. (2016).
- Nepal Foreign Trade Statistics 2017/18. (n.d.). Government of Nepal, Ministry of Finance, Department of Customs.
- Nepal Living Standard Survey . (2001). Kathmandu: Government of Nepal, Central Bureau of Statistics.
- Nepal Living Standard Survey. (2011). Kathmandu: Government of Nepal, Central Bureau of Statistics.
- Prime Minister Agriculture Modernization Project. (2017). Kathmandu: Government of Nepal, Ministry of Agriculture Development.
- Red Book. (2016). Kathmandu: Government of Nepal, Ministry of Finance.
- Red Book. (2017). Kathmandu: Government of Nepal, Ministry of Finance.
- Red Book. (2018). Kathmandu: Government of Nepal, Ministry of Finance.
- Thapa, S. (2007). The relationship between farm size and productivity: empirical evidence from the Nepalese mid-hills. Munich Personal RePEc Archive.
- The Fourteenth Plan. (2017). Kathmandu: Government of Nepal, National Planning Commission.

Annex:

Table 22: Summary matrix - Consistency between the constitution and plans, policies programs and budgetary allocation to agriculture

<u>The Constitution:</u>	<u>Annual policies and programs:</u>	<u>Budget Allocation:</u>	<u>Current scenario:</u>	<u>Remarks:</u>
➤ urges “every citizen shall have the right to be safe from the state of being in danger of life from the scarcity of food.” ➤ guarantees “every citizen shall have the right to food sovereignty in accordance with law.” ➤ Envisions inclusive growth, equity and democracy-based socialism.	➤ Have stressed the need for mechanization and modernization of the agricultural sector. ➤ Have acknowledged of the need of subsidies for inputs including fertilizer, improved seeds, insecticides and pesticides as well as enhancing access to irrigation and road connectivity. ➤ Have pledged for increased investment in agriculture to achieve self-sufficiency in major crops. ➤ Also, the policies aimed at establishment of a social security fund in participation of the farmers. ➤ The policy has also stressed for effective implementation of programs targeted at economically and socially backward farmers. ➤ The policies and program 2075/76 make ambitious statement of doubling agricultural production within five years.	➤ Only 2.28 percent of the total national budget was allocated for agriculture in the fiscal year 2075/76. ➤ Not adequate programs to support small and medium sized farmers.	➤ Poverty incidence higher among landless as well as small and medium farmers. ➤ Small and medium farmers are comparatively more food insecure than larger farmers. ➤ Small and medium farmers have less access to credit and irrigation facilities. ➤ Smaller share of the small and medium farmers has access to different equipment. ➤ Spending per unit of cultivated land on agricultural inputs is larger for smaller farmers. ➤ Inadequate budget for the development of the sector which still engages a large section of the population. ➤ Insufficient budget targeted to small and medium sized farmers.	➤ The government programs have failed to adopt programs targeted at small farmers.

Author Introduction:

Dr. Santosh Adhikari holds a Ph.D. in economics from Indiana University, USA. He is a former Associate Fellow of PRI. His main research interest is in economic policy.



PRI is a think tank of the government of Nepal established on 14 November 2018 in accordance with the Policy Research Institute Board (Formation) Ordinance with a vision to contribute to effective and responsive public policy for national prosperity. PRI's mission is to establish itself as a credible institution that offers informed public policy and its goal is to generate reliable, evidence-based and transformative knowledge for public policy. Its seven core values – quality, objectivity, integrity, diversity, transparency, accountability and engagement – define its workings.

PRI carries out policy research on all issues and sectors of public policy concerns – through five thematic clusters and 17 subclusters – and recommends to the government of Nepal what reforms it has to undertake in each of these policy areas. All researches are conducted in accordance with PRI's public policy research process and standard, which form part of a broad policy cycle.

Knowledge management is an important component of PRI. It operates a public policy dialogue forum as a regular mechanism for learning, sharing and debating policy issues. In PRI's belief, public policy formation requires the combination of three types of knowledge: (a) scientific knowledge generated through research and analysis, (b) administrative knowledge gathered through bureaucratic experiences and (c) societal knowledge developed through social and political processes, such as political debates, media advocacy as well as people's lived experiences.