



An Overview of Fertilizer Distribution Scenario in Nepal: a Time Series Analysis (1991/92-2015/16)

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Date of publication (dd/mm/yyyy): 29/11/2017

Abstract – This study is based on the secondary information published by Agriculture Inputs Company Limited (AICL) and Ministry of Agriculture Development (MoAD) of Nepal. The review study was conducted to analyze the yearly trend of fertilizer consumption in Nepal since 1991/92 to 2015/16. Agriculture Inputs Company Limited (AICL) and Salt Trading Corporation Limited play imported role in import of fertilizers from foreign country and distributed through registered agricultural cooperatives within a country. Sales of chemical fertilizers were increased at the rate of 882.43 MT per year from 1991/92 to 2015/16. Total sale of fertilizers was highly fluctuating and decline up to 2008/09. The trend of chemical fertilizers distributed has been increases after Government of Nepal promulgated subsidy on chemical fertilizers. Under subsidy program 259061 MT of chemical fertilizers was distributed throughout the country in Fiscal year 2015/16. Consumption of fertilizer in Fiscal year 2015/16 is only 83.8 kg per hectare which is very low as compared to that of APP target. Over the years Urea is the most consumed fertilizer, followed by DAP and MOP. It is necessary to increase the fertilizer consumption rate throughout the country to increase the agricultural production and productivity.

Keywords – Agriculture, Chemical Fertilizers, Consumption, Metric Tons and Trend.

I. INTRODUCTION

Agriculture contributes on an average 33 percent to GDP and employs 65.7 Percent of the labor force in Nepal [1]. Among 147,181,000 hectare of lands 3091000 hectare is cultivated i.e. only 21% [2]. Over the last 10 years, population has been increasing at 1.35 percent annually while agricultural land has decreased by 129 thousands hectares [3]. Increasing population coupled with declining agricultural land and stagnant productivity of major cereals has lead to food and self-insufficiency in some districts of the country. To meet the food demand, the productivity of the agriculture should be increased. For this, the pesticides and fertilizers should be used in adequate amount. The various sources of plant nutrients in the Nepalese farming system have been identified [4]. Among them chemical fertilizer is becoming gradually a major source [5]. A number of long-term and medium terms field experiments indicated use of both organic and inorganic sources of plant nutrients for sustaining the productivity for a range of cropping patterns [6], [7] and [8]. The Agriculture Perspective Plan (APP, 1995-2014) had envisage an increase in fertilizer use from 31 kg nutrient/hectare in the

base year (1995) to 131 kg nutrient/hectare by 2015 [9]. However, APP put emphasis on boosting up the agriculture production through use of chemical fertilizers and irrigation in high production potential areas [5]. Similarly, Agriculture Development Strategy (ADS) (2015-2034) has also highlighted the low use of fertilizer as the major reason for low productivity and commercialization [10].

Till 1997/98, Agriculture Input Corporation (AIC) was the only agency for fertilizer trade in the country but fertilizer import by AIC could not meet the demand so that HMG of Nepal de-regularized fertilizer import policy in 1996/1997 and allowing the private sector to import and distribute fertilizers, phasing out fertilizer subsidies, and decontrolling wholesale and retail prices of fertilizers [11]. The deregulation policy did not contribute to smooth supply of fertilizer in the country so that Government of Nepal on March 25, 2009 decided to reintroduce subsidy on mineral and organic fertilizers and AICL has been entrusted with the procurement and distribution of subsidized fertilizers across the country [12]. Since the import data indicates an increasing trend. However, earlier to the introduction of mineral fertilizer into Nepal in 1952, crop production mainly depended on farmyard manure [13]. Demand of fertilizers were increased from 1997/98 to 2001/02 and then decreased dramatically with high amount from 2001/02 to 2002/03 and since then again it again increased up to 204/05. This trend is same for Urea and DAP whereas MOP is increasing from 1997/98 to 2004/04 [14]. NPK consumption in Nepal is 19.65 kg/ha in 2004/05 [15]. Their study also found that the fertilizer consumption was highest (30.4kg/ha) in the year 1994/95 which declined since then and showed fluctuation.

Nepal does not have facilities to manufacture fertilizers. Almost all of the inorganic fertilizers are imported and often received as aid. Seven types of fertilizers are being used in Nepal viz. Urea, Diammonium Phosphate (DAP), Murate of Potash (MOP), Ammonium Sulphate (AS), Single Super Phosphate (SSP), Ammonium Phosphate Sulphate (APS) and NPK [14]. Terai consumes most of the fertilizers sold followed by hills and mountains as Terai is the bread basket of the country. Over the years Urea is the most consumed chemical fertilizer in Nepal followed by Diammonium Phosphate and Murate of Potash [15]. The objective of this study was to analyze the quantity and yearly trend of fertilizer consumption in Nepal since 1991/92 upto 2015/16.

II. MATERIALS AND METHODOLOGY

a. Data Collection and Analysis

The required data were obtained from Agriculture Inputs Company Limited, Kathmandu and Statistics Section within Agri-Business Promotion and Statistics Division of MoAD. Some other required information on Nepalese agriculture were obtained from "Statistical Information on Nepalese Agriculture, 2015/2016" published by Ministry of Agriculture Development, Nepal. The data thus obtained were processed and analyzed using Microsoft Excel software. Table and line graph was used to interpret the results. Mann Kendall test is used to determine the trend of fertilizers uses in Nepal.

III. RESULTS AND DISCUSSION

a. Trend of total Chemical Fertilizers Distributions in Nepal

The trend of total fertilizers sale is presented in Figure 1. Sales of chemical fertilizers were increased at the rate of 882.43mt per year from 1991/92 to 2015/16. In the fiscal year 1991/92 total sales of chemical fertilizers was 185,797 MT and sales of chemical fertilizers was fluctuate up to 2002/03 and then sales of fertilizers declined dramatically its lowest (10328.83 MT) in 2009/10. After fiscal year 2009/10, sales of fertilizers increase up to 2014/15. The detail of annual sales is kept in Appendix 1.

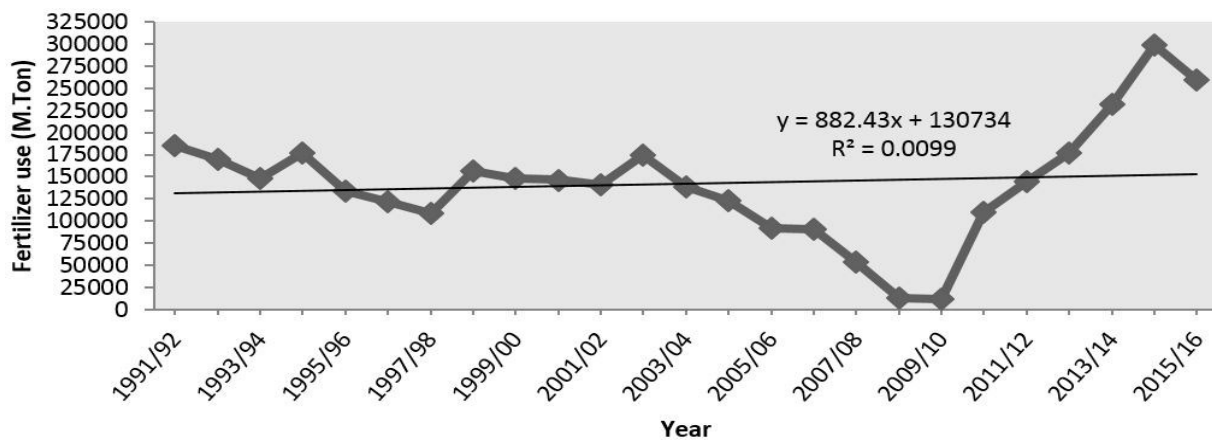


Fig. 1. Trend of total chemical fertilizers distributions in Nepal from 1991/92 to 2015/16

b. Trend of Major Chemical Fertilizers Distributions in Nepal

The trend of fertilizers (Urea, DAP and Potash) sale is presented in Figure 2. Sales of Urea were increased at the rate of 1118.9mt per year from 1991/92 to 2015/16. In the fiscal year 1991/92 total sales of Urea fertilizers was 92674 MT and sales was in decreasing trend up to 2001/02 and fluctuate up to fiscal year 2009/10. Sales of fertilizers inclined dramatically after fiscal year 2009/10 up to 2014/15. The details of annual sales are kept on Appendix 1.

Sales of DAP was increased at the rate of 1107.7mt per year from 1991/92 to 2015/16. In the fiscal year 1991/92 total sales of DAP was 18481 MT after that sales was fluctuate up to fiscal year 2007/08 reaching zero in 2008/09. Sales of fertilizers inclined dramatically after fiscal year 2009/10 up to 2014/15. The details of annual sales are kept on Appendix 1.

Sales of Potash were increased at the rate of 77.33 MT per year from 1991/92 to 2015/16. In the fiscal year 1991/92 total sales of Potash was 2071 MT after that sales was fluctuate throughout the year up to fiscal year 2015/16. The details of annual sales are kept on Appendix 1.

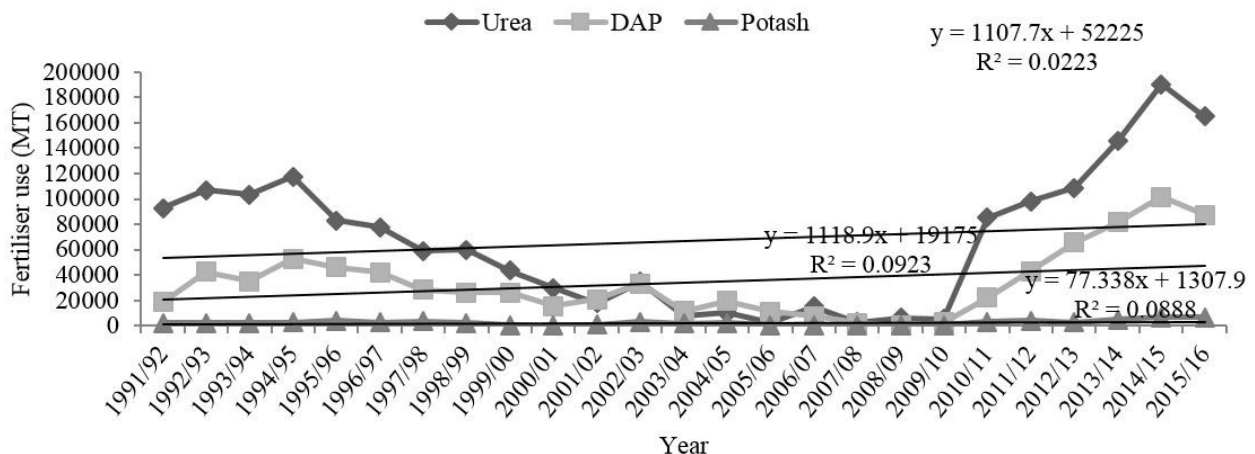


Fig. 2. Trend of major chemical fertilizers distributions in Nepal (1991/92-2015/16)

c. Trend of Fertilizer Consumption Status (Kg/ha)

The trend of fertilizers use is presented in Figure 3. Use of chemical fertilizers per hectare was increased at the rate of 0.7791 kg per year from 1994/95 to 2015/16. The fertilizer consumption per hectare has increased after the implementation of chemical fertilizer subsidy program

(2008/09). Consumption of fertilizer in Fiscal year 2015/16 is only 83.8 kg per hectare as shown in Appendix 2. However, it shows that the consumption level is very low as compared to that of APP target (131 kg/ha). Fertilizer use status of Nepal is very low as compared to that of neighboring countries as well [16].

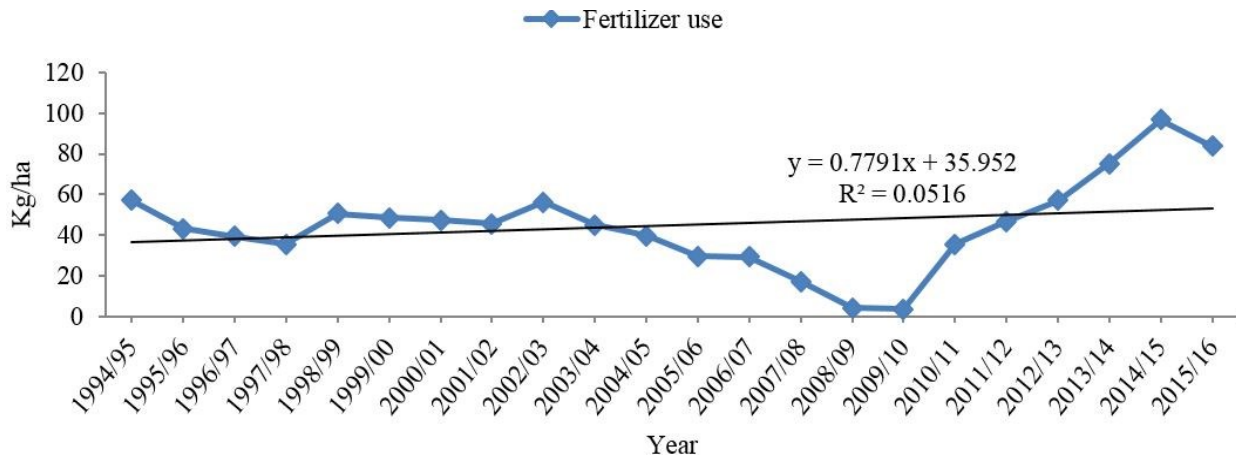


Fig. 3. Trend of Fertilizer use per hectare

d. Trend of Sales of Chemical Fertilizer under Subsidy Program

The trend of chemical fertilizers distributed has been increases (42828 MT per year) after Government of Nepal reintroduce subsidy on chemical fertilizers on March 25,

2009 (Figure 4). 7133 MT of chemical fertilizers was distributed in Fiscal year 2008/09 under subsidy program throughout the country which increased up to 259061 MT in Fiscal year 2015/16 (Appendix 3).

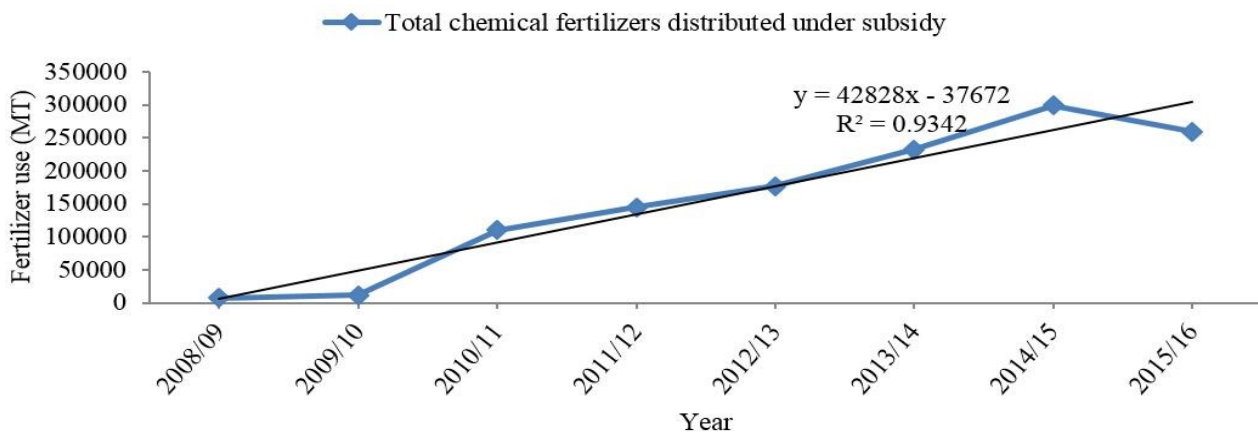


Fig. 4. Trend of chemical fertilizer distribution under subsidy program

IV. CONCLUSION

The amount of chemical fertilizer distributed has increased over the years. Sales of chemical fertilizers were increased at the rate of 882.43 MT per year from 1991/92 to 2015/16. Total sale of fertilizers was highly fluctuating and decline up to 2008/09. Under subsidy program, 259061 MT of chemical fertilizers was distributed throughout the country in Fiscal year 2015/16. Almost all of the chemical fertilizers consumed within country were imported from foreign country. AICL and STCL were responsible for the import and distribution of chemical fertilizers within the country. Over the years Urea is the most consumed

fertilizer, followed by DAP and MOP. Consumption of fertilizer in Fiscal year 2015/16 is only 83.8 kg per hectare which is very low as compared to that of APP target and status of neighboring countries. Increasing commercialization is demanding more of improved inputs like chemical fertilizer so it is necessary to increase the fertilizer consumption rate throughout the country to increase the agricultural production and productivity. Nepal is still dependent on foreign country for fertilizers, it is necessary to establish a fertilizer factory in Nepal to control domestic currency as well as for increment of the fertilizer availability.



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Appendix

Appendix 1. Distribution of fertilizers in Nepal (in metric tons)

Year	Urea	DAP	Potash	Complex	Ammonium Sulfate	TSP	Others	Total (AICL & STCL)	Private Sectors	Total
1991/92	92674	18481	2071	66621	3632	2268	50	185797	NA	185797
1992/93	107005	42418	2005	8990	8574	639	136	169767	NA	169767
1993/94	103201	35217	2129	4624	3087	50	105	148413	NA	148413
1994/95	117716	52806	2630	17	3462	12	45	176688	NA	176688
1995/96	82849	46243	3999	3	64	74	18	133250	NA	133250
1996/97	77577	41921	2725	NA	NA	NA	NA	122223	NA	122223
1997/98	59110	28530	3538	NA	1442	NA	NA	92620	17550	108728
1998/99	59956	26298	2096	NA	NA	NA	NA	88350	68477	156827
1999/00	43508	26156	308	NA	1490	NA	NA	71462	78217	148189
2000/01	29528	15633	58	NA	NA	NA	NA	45219	101146	146365
2001/02	17697	20645	1016	NA	NA	NA	NA	39358	101408	140766
2002/03	34449	33331	2966	NA	NA	NA	NA	70746	103636	174382
2003/04	7428	11377	1688	NA	NA	NA	NA	20493	118265	138758
2004/05	10043	19436	2332	NA	NA	NA	NA	31811	90895	122706
2005/06	1960	10857	478	NA	NA	NA	NA	13295	78258	91553
2006/07	14985	7437	NA	2747	NA	NA	NA	25169	65679	90848
2007/08	2500	1990	NA	2156	NA	NA	NA	6646	47107	53753
2008/09	5935	NA	NA	1198	NA	NA	NA	7133	5677	12810
2009/10	5049	2523	235	3788	NA	NA	NA	11595	NA	11595
2010/11	85191	22001	2821	NA	NA	NA	NA	110013	NA	110013
2011/12	97957	43146	3711	NA	NA	NA	NA	144814	NA	144814
2012/13	108553	65722	2688	NA	NA	NA	NA	176963	NA	176963
2013/14	145622	81520	5046	NA	NA	NA	NA	232188	NA	232188
2014/15	190163	101797	6716	NA	NA	NA	NA	298676	NA	298676
2015/16	164952	87532	6577	NA	NA	NA	NA	259061	NA	259061

Source: MoAD, 2016 and AICL, 2013.

Appendix 2. Consumption of fertilizer in Nepal (in metric tons)

Year	Total AICL and STCL	Private Sector	Total	Kg/Ha
1994/95	176688	NA	176688	57.16208
1995/96	133250	NA	133250	43.10903
1996/97	122223	NA	122223	39.54157
1997/98	92620	17550	110170	35.64219
1998/99	88350	68477	156827	50.73665
1999/00	71462	78217	149679	48.42413
2000/01	45219	101146	146365	47.35199
2001/02	39358	101408	140766	45.5406
2002/03	70746	103636	174382	56.41605
2003/04	20493	118265	138758	44.89097
2004/05	31811	90895	122706	39.69783
2005/06	13295	78258	91553	29.61922
2006/07	25169	65679	90848	29.39114
2007/08	6646	47107	53753	17.39016
2008/09	7133	5677	12810	4.14429
2009/10	11595	NA	11595	3.751213
2010/11	110013	NA	110013	35.59139
2011/12	144814	NA	144814	46.85021
2012/13	176963	NA	176963	57.25105
2013/14	232188	NA	232188	75.11744
2014/15	298676	NA	298676	96.62763
2015/16	259061	NA	259061	83.81139

Source: MoAD, 2016 and AICL, 2013.



Appendix 3. Sales of chemical fertilizer under subsidy program (in metric tons).

Year	Urea	DAP	MoP	Complexal	Total
2008/09	5935	NA	NA	1198	7133
2009/10	5049	2523	235	3788	11595
2010/11	85191	22001	2821	NA	110013
2011/12	97957	43146	3711	NA	144814
2012/13	108553	65722	2688	NA	176963
2013/14	145622	81520	5046	NA	232188
2014/15	190163	101797	6716	NA	298676
2015/16	164952	87532	6577	NA	259061

Source: MoAD, 2016