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Development of Chemical Fertilizer Policy in Nepal

Suraj B.C.^{1*}, M. R. Aryal², Ujjal Tiwari¹, S. Subedi¹

¹Agriculture and Forestry University, Rampur, Chitwan, Nepal

²Ministry of Agriculture and Livestock Development, Kathmandu, Nepal

Abstract

The study was conducted to review chemical fertilizer policy development of Nepal. The study was based on the secondary information available at the Ministry of Agriculture and livestock Development. Agriculture Input Company Limited(AICL) and Salt Trading Company Limited(STCL). This study was focused on comparative study in sequential policy development of chemical fertilizer in the past and present along with their strengths, weaknesses, opportunities and threats. The total demand - supply scenarios of chemical fertilizer in the country at different time phases was intensively studied. The study found that Fertilizer Policy was changed over time to time, but all the policies were failed to fulfill the total chemical fertilizer demand in the country and deficit of chemical fertilizer during time of plantation become a hot issue of every time. AICL and STCL has monopoly in chemical fertilizer trading and no private institutions involvement in chemical fertilizer trading at last phase of policy development. That might be one of the major barriers in fertilizer supply in the country. Government of Nepal lack supervision on fertilizer recommendation, and available fertilizer was used in blanket application method. Problem of soil health identification, farmers' identification and sustainable nutrient management scheme had not been addressed well in every policy developed. Commercialization on farming, increase in education level of farmers and government tried to develop new agriculture development projects through revision of old policies and formulation of new policy provides good opportunities. Government of Nepal could focus on district wise soil health portfolio preparation program followed by the site specific recommendations of chemical fertilizer - a good way of agriculture development in the country.

Keywords: Chemical Fertilizer; Blanket; Portfolio; Commercialization

Introduction

Agriculture is backbone of Nepal. Where two third of population has major occupation as agriculture. Agriculture sector contributes 27.10 percent to the total GDP of country with growth rate of 2.72 percentage (MOF, 2017). Agriculture as a main occupation, it provides a food, income and employments to the majority of the population in country. However, it has not significant contribution on national GDP. The subsistence type of farming system promotes the poverty in future because majority of the people are engaged in small economic works and they have fear of losing current income by accepting risky work on commercialization (Raut & Sitaula, 2015). This situation has major challenge for agriculture development in Nepal,

which is transfer people from subsistence farming to competitive commercial farming.

For the commercialization of agriculture sector agriculture input plays an important role in production process. Availability of good quality input helps in increment of production. Among various inputs fertilizer is the major input because of all essential element supplement. Fertilizer is a vital input for agriculture production .and It not only plays direct role in increasing production but also enhances efficiency of other inputs like irrigation and seeds (Bista, Dhungel, & Adhikari, 2016).

Nepalese farmers are economically unable to purchase costly fertilizer. They are small and marginalized in character with average land holding of 0.68 hectore (MOF, 2017) and majority of them are tenants. Government of

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^{1*}Corresponding author

Suraj B.C.,
Agriculture and Forestry University, Rampur, Chitwan, Nepal
Email: bcsuraj51@gmail.com

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Nepal with keen objective of reduction of poverty by increasing income level of farmer's through increasing crop productivity along with improvement of soil fertility (NFP, 2002). For this objective fulfilment fertilizer is complete solution. The major fertilizer demanding area lies on the terai followed by hills and high hills. The major crop for fertilizer consumption in Nepal is rice followed by maize and wheat, where rice consume 65 percent of the total consumption in Nepal (Shrestha, 2010).

Fertilizer is considered as major tool in various programs of government. Agriculture prospective plan (APP) picked up prioritized inputs like irrigation, fertilizer, road and power and technology. where APP has target of 131 kg nutrient per hectare in 2015 A.D. from base year 31 kg nutrient per hectare in 1994/95 A.D. At the end of APP only 102 kg nutrient per hectare is achieved. where fertilizer used per cropped area in terai, hills and mountain is found to be 152, 101 and 38 kg nutrient per hectare respectively (APP, 2015) Recently developed 20 year agriculture development strategy (ADS) has target of 4 percent organic material (OM) in soil from base year of 1 percent OM in 2010 A.D (ADS, 2015). Prime minister agriculture modernization project (PMAMP) conduct soil testing campaign in different super zone, zone, block and pockets throughout the country. UNFAO run various program related to soil health and sustainable management. Nepal Agriculture Research Council (NARC) is the sole organization in country, which is responsible for research in soil related activities.

Nepal has open border system with India. Many informal activities like informal trade, smuggling and corruption has occurred in border areas. Fertilizer is deficit in Nepal since long before. This deficit condition favors these informal activities. Government only cover twenty five percent of the total requirement of the country and remaining three fourth part is cover by informal trade (Bista, Dhungel, & Adhikari, 2016).

Birjung, Biratnagar, and Bhairahawa are the major borders for fertilizer trading in Nepal. Price of fertilizer in these market are basis for Nepal government to fixed selling price of fertilizer throughout the country based on actual cost. Government of Nepal fixed price of major three chemical fertilizers urea, Diammonium Phosphate and Murate of Potash. Based on actual cost basis, farmers should pay fixed price which is fixed by GoN and if the cost goes beyond fixed price then government of Nepal will pay for it as subsidy (MOAD, 2017).

Growing population with increasing food demand in the country is the major challenge for us. we have two options as solution for this challenge i.e. increasing crop production and increasing cropping area. As we know that, hilly area dominate the major part of the country increase in cropping area is difficult for us. The only alternative we have is increasing crop production and productivity. Increase in

crop production is mainly determined by soil fertility. Where fertility of soil can be enhanced by use of chemical fertilizer. That's why chemical fertilizer is the means for reducing food crisis and poverty alleviation through increase in crop production.

Every year government of Nepal bears a huge amount of economic burden in importing chemical fertilizer in the country. This economic burden of the country could be reduced with the establishment of fertilizer plant in the country. While thinking about fertilizer plant we need to think about raw material availability for its production. Electricity is the main constraint for its production where supply of 200-300 MW electricity is essential in production of fertilizer. The supply of electricity is out of assurance. Raw material for production of Urea, DAP and MOP is limiting agents for fertilizer plant establishment. Among these three urea production in Nepal might be a feasible because majority of raw material needed for production can be obtain from atmosphere but DAP and MOP has higher cost of production due to importation of raw material for its production. Due to this, fertilizer production plant establishment in the country is economically not feasible.

Polices and institutions develop for fertilizer management in the country are changed over several times and fertilizer is still a big problem. Farmers' are unable to get fertilizer in required quantity with standard quality at desired time on feasible price (ADS, 2015). Fertilizer Policies are guidelines for fertilizer management in the country. Deficit in chemical fertilizer in the country indicates that fertilizer policies have still weaknesses and needed to revised again. That's why this study target to review all the chemical fertilizer policies developed in the country.

Chemical Fertilizer in Major Agriculture Policy

This short review includes only National Agriculture Policy, Agriculture Prospective Plan and Agriculture Development Strategy.

1. National Agriculture Policy-2004

NAP-2004, is the mother policy for all agriculture related policies have been formulated and will be formulated in future. This policy is focus on increasing crop production and productivity, commercialization and competitiveness. Where, agriculture is marked as the major tool for crop production and productivity increase. This policy is also focus on assurance of timely supply of chemical fertilizer and guarantee in regular monitoring in import, production, stock and distribution. Provision of agriculture enterprise establishment in this policy opens opportunities for private investors to invest in chemical fertilizer plant establishment.

2. Agriculture Prospective Plan (APP)

APP is the twenty-year development plan from 1995/96-2015. It is the first plan which made agriculture inline and gear up in some extent however, due to several factors it



was not successful. As the base plan of progress, it highlights the agriculture input as the significant tool of change in agriculture. It made target on soil fertility and productivity and also made the trade mechanism and monitoring and evaluation in systematic way. APP targets 131 kg/ha and it achieves only 102 kg/ha after plan phase out.

3. Agriculture Development Strategy- 2015

ADS-2015, is the master plan of agriculture sector for twenty years from 2015-2035 A.D. This strategy is the result plan made after failure of APP and targets to combat all the factors behind it. ADS states the holistic approach on access, efficiency, sustainability, distribution, subsidies and assurance of domestic supply of chemical fertilizer in the country. Problem exists at policy level and trade and distribution level are well expressed with appropriate solution of it. It also identifies the nutrient used at farmer level, poor access of fertilizer (quantity, quality, timeliness and price), illegal supply of low quality fertilizer as major constraints of agriculture development in Nepal. It provides new modality of integrated monitoring and evaluation in input management sector.

Historical Development of Chemical Fertilizer Policy

Fertilizer policy is revised time to time from past (Table 1). With successive time period, several policies, regulation as well as institutions have been formulated and established respectively.

1. Starting working policies - before 1973

Private sectors and National trading limited(NTL) were early traders of chemical fertilizer in Nepal. Private sector firstly started trading of ammonium sulphate and it was followed by NTL. Private sectors started importing from India whereas NTL imported from Russia. Trading at that time was significantly low. With the gradual increment of fertilizer demand of country, systematic importation and

distribution function was handled over Agriculture Input Corporation(AIC) which was established under ministry of agriculture at 1966 A.D. It was the first public sector enterprise which handled procurement and distribution of chemical fertilization in a country. AIC started trading from international market, initially it was from India and later from other nations like Russia, Turkey. With certain assurance of fertilizer availability total fertilizer demand was increased then after. At that time, price of fertilizer was determined with considering cost on fertilizer along with transportation cost. This made more price for hilly farmers and not charged to farmers of terai. At later pricing system was changed. After this hilly farmer's paid low price as compared to what they actually charged after including cost of transportation. The reduced price was beared by farmers of terai with higher charge of per unit cost. This system of pricing was adopted up to 1972.

2. Subsidy Policy (1973/74-1996/97)

After rose up of international price of chemical fertilizer, government of Nepal started to introduce price subsidy and transportation subsidy in selected high and mid hills. That subsidy scheme had purpose of decrease in price at farmer's level and discourage the outflow of chemical fertilizer from Nepal to India by keeping 15-20% higher price than that of India. Subsequent increase in international price of fertilizer government of Nepal faced a problem of economic burden. After that, government formed then after weren't try to manage this problem and it became a political commodity. AIC was unable to adjust the supply and demand of chemical fertilizer in country without government support. AIC started to import in meager quantity of fertilizer. That problem was identified by countries like Canada, Japan, Germany and Finland and they started to provide grant aid. That type of aid was not for longer period, most of the country stop it from 1992/93.

Table 1: Chemical fertilizer policy and institution development

Chemical fertilizer related policies development	Chemical fertilizer trade related institutional development
<ul style="list-style-type: none"> ➤ Starting working policies - before 1973 ➤ Subsidy policy (1973/74-1996/97) ➤ Deregulation policy(1997/98-2007/8) ➤ Fertilizer control order-1999 ➤ National Fertilizer policy-2002 ➤ Chemical fertilizer subsidy policy(New) - 2009 	<ul style="list-style-type: none"> ➤ Starting with private traders ➤ Involvement of National trading limited as public institution ➤ Establishment of Agriculture input corporation(AIC) in 1966 A.D ➤ Both AIC & Private sector (1997/98 - 2007/8) ➤ Involvement of only AICL & STCL in trading from 2009/10 ➤ Agriculture Input management section in MoAD



3. Deregulation Policy (1997/98-2007/8)

Deregulation Policy aimed to control monopoly of AIC in chemical fertilizer trading in the country. After deregulation both AICs and private sectors were involved in chemical fertilizer trading. Under this policy government removed subsidy scheme on DAP and MOP and planned to remove subsidy on urea in different time phases. Deregulation Policy mainly focused on major three aspects removal of monopoly on fertilizer trading, diminished the economic burden of the country impacted by subsidy and removal of price control mechanism in the country.

For the implementation of deregulation policy fertilizer control order-1999 and National fertilizer policy-2002 were formulated under the essential commodity control act-1996. To institutionalized and regulate this policy AIC is divided into two companies Agriculture Input Company Limited and National Seed Company Limited with different functional responsibilities.

4. Fertilizer Control Order-1999

Fertilizer control order was formulated with the aim of ensuring quality control mechanism at importing production and distribution level. This order also emphasized on the legalization and registration of private business towards fertilizer business and made a provision of fertilizer inspector.

5. National Fertilizer Policy-2002

This policy is main guidelines for formulation of other fertilizer related rules and regulation in the country. Main Objective of this policy is to alleviate poverty of country through increase in crop productivity by making improvement in soil fertility. Different strategies have adopted for improving past short comings.

Different principles are identified in this policy. These policy principles are taken as target with supportive activities

I. Principle of Assurance

This policy guides, all the activities on demand and supply of chemical fertilizer can assure the quality, quantity, timeliness and price in accordance with farmer's capacity.

II. Principle of Equality

Public, co-operative and private agencies can participate in trading of chemical fertilizer in the country equally.

III. Principle of Rationality

Proper use of chemical fertilizer and use of research and extension approach in fertilizer

recommendation and application in the country should be followed.

IV. Principle of Sustainability

Use of Integrated Plant Nutrient Management approach in reclamation of marginalized land and maintenance of cultivated land indicates the future thinking on sustainability is identified.

V. Principle of Globalization

With the help of modern technological tools and ICT techniques fertilizer procurement, supply and demand fulfillment of chemical fertilizer in the country can be managed.

VI. Principle of Development

For effective monitoring, evaluation and distribution of chemical fertilizer in the country proper infrastructure development and suitable environment should be created.

6. Chemical Fertilizer Subsidy Policy(New) - 2009

Deregulation policy failed to bring desirable impact on improving supply situation and quality control in the country as a result of which new subsidy policy came into action.

Features of current subsidy scheme

- Provision of maintaining selling prices of fertilizer at 20-25% higher than that of India at five import points (Biratnagar, Birgunj, Bhairahawa, Nepalgunj and Dhangadhi).
- Agriculture Inputs Company Limited (AICL) and Salt Trading Corporation Limited (STCL) are responsible to import and distribute the chemical fertilizer.
- The difference between actual cost and subsidized price will be provided as subsidy to AICL and STCL (subsidy administration is on cost sharing basis).
- Provision of subsidy distribution management committee chaired by secretary of MoAD. The committee is responsible for price fixation, fund release and overall monitoring and evaluation of the subsidy program.
- Subsidized fertilizer will be available for 0.75 hectare in hilly districts and 4 hectares in terai districts to the technical requirement of three crops per year.
- Subsidized fertilizer is distributed through offices of AICL, STCL and cooperatives.

- Chief District Officer (CDO) of the respective district chairs the Fertilizer Supply and Distribution Management Committee which is responsible for overall management of fertilizer distribution at district level.

The agricultural Inputs Management Section (AIMS) under ministry is mandated to formulate policy guidelines for administration and implement the activities regarding inputs management in the country.

Demand and Supply Trend of Chemical Fertilizer in Nepal

Several methods and methodology was adopted for managing demand and supply at equilibrium Supply-demand of chemical fertilizer is major issues of past and

present. Prior to the deregulation policy AIC was the major importer and distributor of chemical fertilizer. AIC had full control on procurement and distribution of chemical fertilizer but price determination was handled by government of Nepal. After commencement of deregulation policy, Public and private sectors both were involved in trading of chemical fertilizer where, private sector had significant role on it.

The Fig. 1 stated that total fertilizer supply in the country is minimum at initial time of chemical fertilizer importation and reached to minimum point in 2008/09 with import of 12810 Mt. After new subsidy policy came in action at 2009/10 the supplied quantity is gradually increased per year with increasing rate.

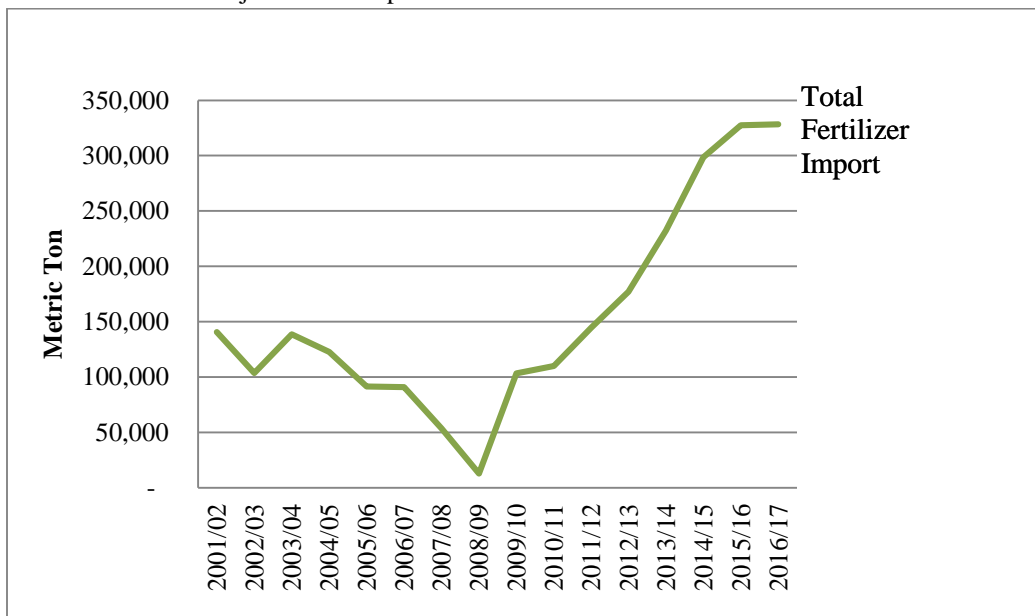


Fig 1: Total chemical Fertilizer Supply trend from 2001/02 to 2016/17

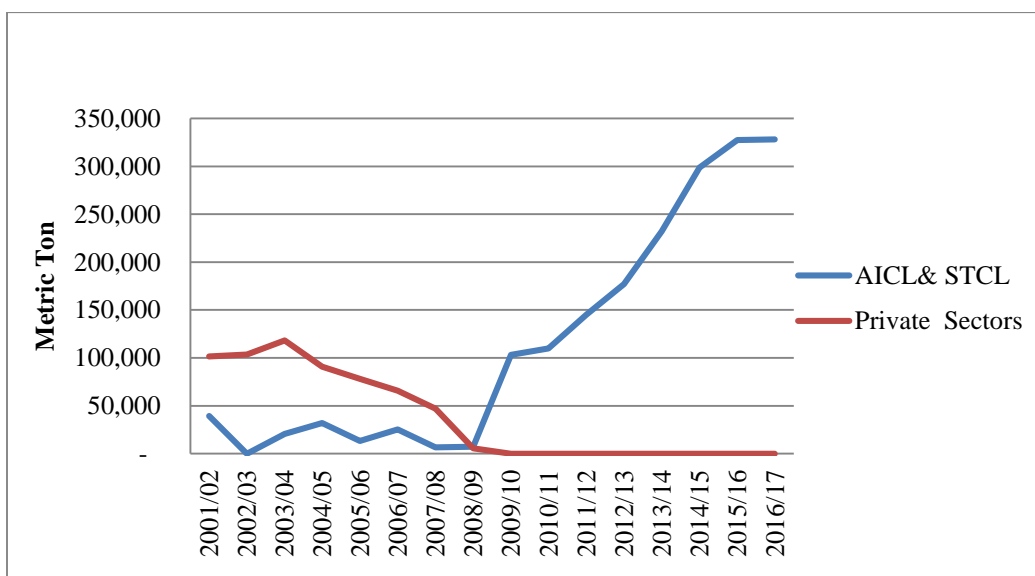


Fig 2: Chemical fertilizer supply trend from 2001/02 to 2016/17 by AICL and STCL



After analyzing Fig. 1 and Fig. 2, it was found that total chemical fertilizer supplies in the country directed with both private sector and AICL and STCL up to 2007/08 with significantly low in quantity. Where, private sector contributed most of the quantity but after 2009/10, in global price level was increased, government start new subsidy policy then after no private sectors were able to compete with subsidized fertilizer and stop importing chemical fertilizer in country on that price and they dropped out from business. With the commencement of new subsidy policy, the quantity supply was increased over 2009/10 to 2016/17 however it only covers twenty percent of the gross domestic demand of the country. At 2016/17 the total quantity demand of chemical fertilizer is found to be 8,00,000 MT (AIMS-MOAD, 2017) which is far beyond the quantity supplied in the country. This information showed that the gap between quantity supply and quantity demand of chemical fertilizer is not managed miracally and is found to be a main agenda of discussion in policy formulation in the country.

Chemical Fertilizer Situation After New Subsidy Policy

Data shown in the Table 2 shows that after new subsidy policy came into action the chemical fertilizer supply in the country was increased over time. The subsidy provided was range from 38.76 % to 57.79 %, where subsidy percentage is percentage of total cost. The subsidy provided was estimated on an average 43.78 % on which government allocated NRs. 33,608,050,017 from year 2008/09 to 2016/17. At the same time, 1,736,095 Mt chemical fertilizer was imported with the cost of NRs 76,768,384,000.

With considering these nine year, the average annual subsidy expenditure was NRs. 3,734,227,780. Similarly, average import was 192899 MT and average sell was 181815 MT. with the average cost of NRs 8529820000.

SWOT Analysis of Current Fertilizer Policy is shown in Table 3.

Table 2: Fertilizer import, sale and subsidy provided in the country

Year	Import (MT)	Cost ('000 Rs)	Sell (MT)	Subsidy (Rs)	Subsidy (%)
2008/9	22,484	688,087	7,090	366,812,126	53.30
2009/10	81,594	2,819,139	81,845	1,370,518,260	48.61
2010/11	149,907	6,195,372	110,031	2,526,380,818	40.78
2011/12	112,126	5,415,758	144,813	3,129,947,630	57.79
2012/13	220,544	11,468,933	176,963	5,171,837,181	45.09
2013/14	273,239	12,786,106	232,879	5,308,772,649	41.51
2014/15	281,000	12,919,793	298,677	5,324,806,353	41.21
2015/16	287,430	12,236,820	259,061	5,665,075,000	46.30
2016/17	307,771	12,238,376	324,977	4,743,900,000	38.76
Total	1,736,095	76,768,384	1,636,336	33,608,050,017	43.78

Table 3: SWOT Analysis of Current Fertilizer Policy

	Beneficial	Harmful
Internal	<u>Strengths</u> <ul style="list-style-type: none"> ➤ Establishment of Agriculture Inputs Management Section as separate section in Ministry of Agriculture and livestock management(MoAD) for handling specific task of fertilizer ➤ Formulation of district wise working plan, policy frame work and regulation guidelines for supply assurance of chemical fertilizer ➤ Regular budget allocation on chemical fertilizers supply ➤ Involvement of Agriculture Inputs Company Limited (AICL) and Salt Trading Corporation Limited (STCL) in import and distribution of chemical fertilizer 	<u>Weakness</u> <ul style="list-style-type: none"> ➤ Poor monitoring on fertilizer inspection and regulation of program ➤ Complicated procurement procedure under public procurement act leading difficulty in timely supply of fertilizer ➤ Insufficient budget allocation for chemical fertilizer demand fulfillment ➤ No Private institution participation for chemical fertilizer trade ➤ Fertilizer trade is limited to Urea for Nitrogen, DAP for Phosphorous and nitrogen and MOP for potash and not considered other nutrients as major ➤ Unfair scheme of land holding requirement for getting subsidy ➤ Distribution system is not clearly defined and it creates chance of bias



Table 3: SWOT Analysis of Current Fertilizer Policy

	Beneficial	Harmful
External	<p><u>Opportunities</u></p> <ul style="list-style-type: none"> ➤ As a member of WTO, several options for fertilizer import and not limited to few countries. ➤ Foreign investor seek for investment at good option ➤ Fertilizer importing countries covers most of the world that's why market is created if fertilizer plant can be established in the country 	<p><u>Threats</u></p> <ul style="list-style-type: none"> ➤ Total fertilizer availability on the country is depends on the import from another country so it creates dependency ➤ Price of the fertilizer on the country is based on the international price so chance of fluctuation price in any time ➤ Distortion of fertilizer market due to subsidy scheme leading to dismal participation of private sector in the business. ➤ Porous border creates threat of competition between subsidized fertilizer to the cheap, adulterated and low quality Indian fertilizer ➤ Increasing use of chemical fertilizers may result to decline in soil health in long term. ➤ Chance of illegal supply of subsidized fertilizer in Indian Market

Conclusion

This study reviewed policies related to chemical fertilizer in Nepal. It is found that Nepalese farmer's faced major problem of unavailability of chemical fertilizer from a long time ago. If available, it is untimed, inadequate and adulterated in nature. Absence of fertilizer industry in Nepal, total chemical fertilizer available is solely from import that's why price of chemical fertilizer is directly relate to international price. As a result this dependency creates major threat for Nepal. Monopoly of AICL and STCL in fertilizer trading of the country and private institutions were not engaged. Trend analysis showed that chemical fertilizer in the country is left the total supply in the country. Government focused on various programs recently but growth rate was quite slow. This speed will take more than half century to equalize the current demand.

Recommendation

1. Government of Nepal open tender for limited number of private sector with quality and quantity guidelines. Then these private sector helps on work of AICL and STCL as a result availability of fertilizer throughout the country. The government of Nepal acts as the regulatory body and conduct periodic monitoring and evaluations on guidelines.
2. Government recommend fertilizer in generalized blanket form that means recommendation of fertilizer for rice is same for all district without determining nutrient status. Nutrient recommendation varies with place. If we make district wise nutrient portfolio, it might be a guideline for different recommendation for

different places and helpful to balanced use of fertilizer accordingly.

3. The program of distribution of Farmer Identification Card (Kisan Parichaya Patra) should be tied with the subsidy program. The card will identify small, medium and large farmers and allow subsidy program accordingly.

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